VOLUME 41 WINTER 1971

THE ULSTER MEDICAL JOURNAL

PUBLISHED BY
THE ULSTER MEDICAL SOCIETY

CONTENTS

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DEPARTMENT OF MEDICAL STATISTICS,
INSTITUTE OF CLINICAL SCIENCE,
GROSVENOR ROAD, BELFAST BT12 6BJ.

.....19.....

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THE
ULSTER MEDICAL JOURNAL

PUBLISHED ON BEHALF OF THE ULSTER MEDICAL SOCIETY

VOLUME 41 WINTER 1971 No. 1

CNIDOS v. COS

by

SIR JOHN HENRY BIGGART, C.B.E.

Presidential Address to Ulster Medical Society, Session 1971–1972

SET in the azure Aegean sea is the island of Cos. Not far to the east is a promontory on which was once the city of Cnidos. Both were inhabited by Greeks, yet even as in our own country Greek did not always agree with Greek, and differing solutions to the same problem often led to considerable variation in opinion. Yet here in these two small land areas took origin some of the very basic concepts of our profession. Here in the fifth century B.C. flourished the two most important medical schools of ancient times. It may be that Cnidos was slightly senior to Cos, but there is little evidence available. Superficially there was much resemblance between the two schools. The basic medical knowledge of the times was common to both. Their anatomy was based on animal dissection and possibly also on their examination of injuries sustained in war and by accident. Their organisation was similar and whilst in Cos Hippocrates ruled and taught, in Cnidos Euryphon held much the same position. Yet in spite of the similarities in structure and organisation each developed his teaching methods and philosophy along such differing, yet entirely rational, lines that one can scarcely find a greater contrast in any period in the development of our profession.

Most of what we know about the Cnidians is contained in the criticisms of the Cnidian sentences or maxims put forward by Hippocrates in his book Regimen in Acute Diseases. He alleges that the Cnidians attached too little importance to Prognosis: that their treatment was faulty and that they carried classification of diseases to the extreme. It is clear that their treatment was influenced by Egyptian medicine, and that like the Egyptians they believed that many of the disease producing toxins could be eliminated by purging. They had little knowledge of pathology, and had little sympathy with the ideas of 'general pathology' promulgated on the island of Cos. So too they were opposed

to the doctrine of prognosis. Rather did they believe that a detailed classification of diseases would establish a scientific basis for medical progress. To this end they grouped diseases according to symptoms and syndromes, insisting that variant symptoms indicated different diseases – a thesis which was attacked by Hippocrates but only subsequently disproved by the advent of modern pathology. It is probably no discredit to the Cnidians that they classified wrongly for they lacked, as did the Coans, the fundamental knowledge of the basic sciences, and had not learned to distinguish between the essential and the non-essential observation. They possibly erred more grievously when they gave more credence to the system of knowledge than to the things to be known. Indeed this search for systemisation and classification developed as the core of their philosophy.

Yet they deserve the credit for being the first medical school to promulgate the concept that medicine was a science – though curiously Alcmaeon, almost a hundred years earlier, following his discovery of the optic decussation, had claimed a similar scientific base for medicine. They believed that such a system of scientific medicine, founded on a well grounded classification of disease, would endure for all time. Unfortunately their concept led to an over-refinement of diagnosis, and to an over-elaborate theory of disease into which the patient had to fit, with the resultant neglect of the patient as an individual.

In the meantime, in nearby Cos, Hippocrates was developing a very different concept of what the practice of medicine entailed and of what the function of the doctor should be. In contrast to the Cnidians, the school of Cos held that the true task of the physician consisted less in the drive for knowledge and its satisfying insight into the nature of disease than for the search for general principles of treatment. The idea that the art of healing could be transformed into a science and therefore made available as a profession to everyone of sufficient intellectual ability was opposed. They emphasised that those who should become physicians should have certain special qualifications – qualifications for which pure scientific knowledge could not compensate. They emphasised that medicine was an art, an art to be possessed only by the born physician, and so they left to the modern dean, and to U.C.C.A. a problem which is not yet resolved.

To them medicine was an art – an art with its own boundaries and to be developed within these limits.

The practice of medicine also meant that the physician should possess and demonstrate in his way of life certain moral and ethical attributes such as unselfishness, a respectful bearing towards patients, modesty, dignity, honour and willingness to work. Indeed Hippocrates wished the doctor to develop the capacity to subordinate his own interests to that of his patient.

Experience teaches, for experience gained from the course of the disease in previous patients was important in guiding the physician in his treatment of other patients and in enabling him to assess the course of the disease and its ultimate prognosis. Sickness was viewed as a battle between the curative powers of the body and the disease producing cause. With such belief the role of the physican was supportive. Hence the training of the physican was that of an apprentice gaining experience in his clinical work, and being guided by his teacher in the support of the natural curative forces of the body from his

greater experience in the estimate of prognosis. "The true object of architecture is not bricks, mortar or timber but the house". The true objective of the doctor is therefore not his drugs, or his biochemistry, or his knives and forceps but the well patient. "Diligent study is like the cultivation of the fields: and it is time which imparts to all things and brings them to maturity".

The student "must also bring to the task a love of labour and perserverance so that instruction taking root may bring forth proper and abundant fruits".

So for Hipprocrates medicine was an art, but if one takes the trouble to look at the original works instead of commentaries no modern doctor would fail to be impressed by the fact that Hippcrates was one of the first and greatest ecologists. He saw man clearly – not only as an individual but also as part of the universe in relation to the wind and the weather, to food and diet. His writings still purvey a more comprehensive view of man than even those of modern ecologists.

What pathologist would not agree with Hippcrates on his conclusions, based as they were on purely clinical observation and deduction?

"If one injures the smallest part of the body, the whole body actually would experience the disturbance for the very simple reason that the very smallest part actually is composed of the same things as the whole and the single part transmits even the smallest impulse, good or bad, to all the other parts that are associated: this because the entire body is integrated with the small parts in pain as well as in pleasure, for the smallest parts transmit to related parts and then again pass on the impulse".

It is not surprising that Coan medicine with its emphasis on human ecology, on the individuality of the patient, and the ultimate primacy of man, grew into something more than a mere craft, but rather into a leading cultural force in the life of the Greek people. From that time it is not remarkable that medicine became an essential component of general culture. It is not unexpected that the more highly developed medical science of to-day, developing as it did from the rediscovery of the Greek and Roman literature and thought in the Renaissance period, has become so highly fragmented and specialised that it can no longer play a similar role in the general culture of our time.

So balanced against the scientific approach of the Cnidians we must place the more artistic and philosophic concept of Hippocrates, who saw man whole, and his environment as a whole. Who saw that knowledge and appreciation of natural science had to be reinforced by moral grandeur – the humanity of the physician with the humility of the philosopher, together with somewhat of the artistry of the poet.

Let me quote from Hippocrates something written 2,000 years before Omar Khayyam – "Potters spin a wheel which shifts neither forwards or backwards, yet moves both ways at once, therein copying the revolutions of the universe. On this, which as it revolves they make pottery of every shape, and no two pieces are alike, although they are made from the same materials and with the same tools. Man and animals, too, are in the same case."

And finally for the benefit of those who attempt to create new curricula, and

who do not always distinguish between the acquisition of facts and the educational development of their students let me quote Hippocrates – "Medicine is the most distinguished of all Arts . . .

The learning of medicine may be likened to the growth of plants. Our natural ability is the soil. The views of our teachers are as it were the seeds. Learning from childhood is analagous to the seeds falling betimes upon the prepared ground. The place of instruction is as it were the nutrient that comes from the surrounding air to the things sown. Diligence is the working of the soil. Time strengthens all these things so that their nature is perfected."

Is there not here more than a suspicion of the parable of the sower, or of Osler's famous analogy in his Text-book of Medicine.

Thus in the very beginning of medical philosophy were established the two schools of medical thought – of medicine as a science prescribed for the patient, and of medicine as an art devoted to the medical care of the patient. In the long history of our profession these two concepts have occassionally survived in peace with each other, but more often they have diverged in their aims and their accomplishments. In their initial struggle Hippocrates – the ecologist, artist and poet, finally had the greater influence and the adherents of Euryphon and medical science for some centuries suffered eclipse. Yet the philosophic seeds planted in these two schools at the time of the flowering of Greek philosophy and culture have been our profession ever since, and it may be that the time has come for clarification of the purposes and function of the physician relative to these two primordial concepts.

Why should it be, asks Allport, that science, that epitome of rationality, should part company with common sense over the fact of human individuality? The outstanding feature of man as a living sentient being is just this individuality. He is a unique creation in the broad ecology of nature. Yet because of his very uniqueness the sciences regard him as somewhat of an embarrassment when with harsh insouciance he intrudes his undeniable unpredictability into their several arbitary and carefully ordered theses.

For the god of all science is the Universal Principle of which the individual may be an instance or an example – but of which equally, he may be a most brazen contradiction. The failure of the Cnidians to distinguish between the essential and the non-essential – to continue to fit the individual into the partly scientific schemes of medicine – still persists.

Even in religion the concept is that the individual casts his burden not on a theocratic institution but upon another individual. To those of us who believe in the primacy of man – of the individual man – the relationship is not only that of the patient to the welfare state but in the final analysis of the patient to his physician.

And so as one reads the history of medicine it becomes obvious that the basic contrast between the schools of Cnidos and Cos still persists, and has always persisted. The record shows that there have been many periods when clinical medicine – the medical care of the individual patient – seems to have ceased to exist, and philosophic and what in retrospect now appear to be pseudo-

scientific theories have dominated the practice of our profession. Yet periodically there has been a clinical rebirth. Hippocrates in 400 B.C. corrected the Cnidian Maxims. Then for many centuries medicine laboured under the Galenic thesis, but in the latter part of the seventeenth and the beginning of the eighteenth centuries there was a great revival of clinical observation and teaching and reorientation of medical thinking stimulated by Sydenham in England, Baglivi in Padua, and by the greatest of them all, Boerhaave in Leyden. Medicine was once again liberated from the theocratic speculations engendered by Cullen who founded the Glasgow school, or Rush in Philadelphia or Brown in England and many others. Yet in the young America it once again needed someone like Osler to bring back bedside teaching and to re-emphasise the importance of clinical empirical medicine. Marion Sims, after whom our obstetricians have named their major undergraduate award, had never examined a patient when he graduated in Philadelphia, and there were numerous others who were in a similar state. The dispensation of medical knowledge to the individual patient was not part of the prevailing thesis. Even in my own experience in examining I have met students who had examined up to two patients in their undergraduate years. Unfortunately in modern times, partly as the result of the great increase in our basic factual knowledge there has developed a neo-Cnidian school of thought.

The fact that there were great and successful physicians before the development of laboratory medicine is forgotten – indeed I have had young men in training emphasise that before the advent of our modern battery of drugs, medicine had little to offer to the patient. Little do they know of their own weakness – little do they appreciate that it was in the treatment of the individual patient and in the appreciation of his individuality in relation to his total environment that much good was wrought, and that in the process the doctor himself attained the full flowering of his own personality. The modern alternative of the specific drug, whilst often bringing control of the disease, does not itself necessarily bring the same solace and understanding to the patient.

Furthermore with the changing pattern of disease – of genetic and degenerative processes superseding those which came to the body from without, and which modern science has shown itself so competent to control – the role of the doctor may once again revert to the Hippocratic art of seeing and treating the individual patient as part of his total ecology. Claude Bernard – that greatest physiologist – emphasised that "La fixité du milieu interieur est la condition de la vie libre". Yet to-day with our battery of biochemical tests, our overall screening of the patient, and the urgent rush to correct what we believe is the slightest derivation from the electrolytic norm, if such a norm has yet been established, the body is given less and less opportunity of using its age-old ability to establish its own 'fixité du milieu interieur'. Any pathologist will verify that our scientific approach is still far from perfect, and that the establishment of what appears to be a biochemical normality not infrequently results in the death of the patient – drowned as a result of his own physiological processes being overtaken by the Cnidian pseudo – because incomplete – science of our times.

Even our apparently scientific practice is dictated by medical fashion. To our ancestors of not so long ago the eventual panacea for many diseases was the

therapeutic practice of bleeding. As a house physician I was ordered to do it myself. There was a veritable orgy of blood letting, practised not only by the relatively unscientific but also by some of the most eminent thinkers of their times. In retrospect we think we appreciate their errors. To-day in contrast we have developed the opposing thesis, and intravenous fluids of various compositions are used in ever increasing amounts. Just as one saw in the autopsy room the effects of indiscriminate bleeding, to-day one also sees the effects of over-enthusiastic transfusions. But we have our reasons, and scientifically and soundly based, and can a transfusion of this or that – do aught but good.

The stage, however, has now been reached when no one doctor can hope to possess the whole of medical knowledge for the benefit of his patient. Until the recent war I had thought it possible for an individual to encompass the whole of our current medical knowledge. But to-day even with the advent of computers it is doubtful if the entire corpus of our current scientific knowledge can be deployed for the benefit of one individual.

It is a curious fact that doctors have persistently over-estimated the current scientific standards of their profession. Alcmaeon 600 years B.C. was content that medicine had reached the standard of a science. In turn Boerhaave in Leyden, Rush in Philadelphia, Bilroth in Germany, Charcot in Paris, and Osler in America all extolled the great scientific conquests of their times. Who of us has not been guilty of a similar enthusiasm for the scientific peaks of our generation?

Seventy years ago Osler was content that medicine had as it were arrived. "Never has the outlook of the profession been brighter. Everywhere the physician is better trained and better equipped than he was 25 years ago. Disease is understood more thoroughly, studied more carefully and treated more skillfully. The average sum of human suffering has been reduced in a way to make the angels rejoice. Diseases familiar to our fathers and grandfathers have disappeared, the death rate from others is falling to the vanishing point and public health measures have lessened the sorrows and brightened the lives of millions".

We too could hymn the conquests of the last fifty years, and tell the story of the sulphonamides, the penicillins, and the tetracyclines, and acclaim the triumphs of our preventive medicine. The diseases coming from without have been controlled. In developed countries no longer is there fear of typhoid, cholera or plague but man continues to die, and as one looks through the pathological records of the last fifty years one sees that the picture has merely changed from one type of disease to another, and that even in the success of our conquests we have merely unbared the next layer of the onion. It is true that the most important diseases of our time have now been transformed in general to an older group of the population. Tuberculosis no longer claims its victims between the ages of 15 and 25, but the new layer of diseases made apparent by the success of our current medicine introduces new problems to our medical concepts. Now we are confronted with the problems of cardio-vascular disease, of malignant disease, of mental disease, and of a series of diseases consequent upon the wear and tear of the body with increasing years. Perhaps even more important is the failure of the profession to obtain the co-operation of the public in saving themselves. For all these problems there is no vision of a further miracle working

drug, nor can further control of the environment render hopeful solutions. Rather do these problems reinforce the idea that clinical medicine has a more than ever important part to play. Complicated laboratory tests, radio-active tracers, antibiotics, corticosteroids and what you will of the modern medical armamentarium can do little or nothing to modify disease processes that take their origin in genetic inheritance or in intrinsic immuno-pathological processes that are the result of the ageing of our tissues and our cells. And so there comes to pass an ever-increasing population who require the best clinical diagnosis, but even more the best Hippocratic clinical treatment – each and every one according to his individuality.

To-day the problems of disease in developed countries are concerned not with the impact from the environment, not with bacilli and viruses and parasites – though naturally we keep a watching brief on all such foreigners – but mainly from disease emanating from intrinsic processes within ourselves. By rationalising nutrition, by control of the environment, by our antibiotics many of the common diseases of the not too distant past, which are still present in the underdeveloped countries of the world, have been for us abolished or at least controlled. Pasteur looked forward to the day when all disease would be conquered, but he did not forsee that the conquest of environmental, nutritional and infectious diseases would unmask a whole sequence of diseases which would pose entirely new problems to our profession.

Cnidos and its disciples have been successful – medical science has overcome many problems but one is forced to ask has the Cnidian concept had its day, and is not the Coan idealogy once again to dominate the thinking and practice of our profession.

Many of our modern techniques deal with some specialised and therefore limited aspect of man. Each specialised technique is set in the framework of a relatively simplistic mechanical philosophy of structure. So too often the student sees the patient less and less as a person, a whole individual, but rather as a composite of an infinite number of variables. In this way we tend to repeat the errors of our Cnidian predecessors and forget that scientific advances from a medical point of view must go hand in hand with improvement in medical care.

We can over-play what appear to be our scientific successes. Has cortisone sustained the exuberance that marked its appearance? Has the public not encouraged the profession to over-play its technical achievements in cardiac transplantation? Have not, sometimes, our therapeutic achievements tended to hinder rather than to advance the essential basic knowledge of the disease process? Has the advent of tranquillisers stimulated or repressed our attempt to understand the basic process of mental disease? These and many other questions lead one to challenge some of the bases of our neo-Cnidian medicine.

Even in our advances we must maintain an alertness that those things which are good are preserved. We should remember that though beside teaching and a recrudescence of Coan medicine was instituted by Montanus and Baglivi in the 1500's, in less than forty years it had again disappeared and been replaced by the relatively sterile professorial discourse. So too in Leyden with the retirement of

Boerhaave the students no longer walked the wards of St. Cecilia. Even in our own days one sees some of the incentive of Hippocratic medicine flame for a time, and then grow dim as its apostles grow old and disappear into the limbo of forgotten goodness – grow less intense, grow heavy and finally cease by the wayside.

From a different aspect Sir Macfarlane Burnet in his recent book raises much the same question. The great welter of experimental research has carried investigation from the patient to the organ, to the tissue, to the cell and finally to the molecule and to the gene. It has no doubt produced its rewards, and provided that this new access of knowledge has been properly dispensed to the patient medical practice has profited. Yet he does not believe that future laboratory research will necessarily result in the evolution of any new principles of medical treatment. We will learn a great deal about genes, and molecular biology will continue as a science to contribute to the basic fund of factual knowledge, but its contribution to the further conquest of disease, or of adding not years to life, but life to years will be an ever-diminishing one. It may well be that such studies will be pursued more and more by the pure scientist, and that scientists and practitioners dedicated to the medical care of the individual will play an ever decreasing part. In the past in the medical laboratory its exponents, in common with their clinical colleagues, had still the belief that somehow and sometime their work might have a beneficial effect for the individual patient or socially if the goddess of good fortune smiled on them for the benefit of humanity as a whole. In a medical future in which it would appear that care rather than cure will be the main function of our profession there is every need for the recrudesce of the Hippocratic ideal.

It may be of interest to note that Hippocrates observed the greater the environmental variablity the greater the output of unusual persons. He himself lived in a period of stress not unlike our own. Marathon was fought 35 years before his birth. As he was born the Persians invaded Egypt. When he was 30 Athens suffered the Great Plague: as he died Athens and Sparta put their differing philosophies to the final arbitrament. So may it not be opportune to suggest that out of the maelstrom of our own bomb racked and conflagrant society there may arise some attraction to that well travelled goddess of Health – Minerva – that once again a physician may think more clearly than his fellows, and that here for a time – for Minerva has ever been fickle – the proper balance between Cnidos and Cos, emphasising the primacy of the individual, whilst utilising all that is best in the science of medicine towards the maintenance of that individuality, will bring forth the flowering of Medicine of our times. For a time Minerva dwelt in Padua, then gave her love to Boerhaave in Leyden, paused for a while with Louis and Charcot, then passed to Virchow and his compatriots in Germany. I think she had quite an enjoyable affair with Sydenham in England, but more recently she has given her affection to the Americans. Yet in the beginning it was to the small communities in Cnidos and Cos that she surrendered her charms, and it was from these small communities that arose the basic conflicts that we have so far failed to resolve. Would that one was young again and could attract

Minerva. It may well be that from this small area, enshrouded by turmoil comparable to that of Hippocratic times a true philosophic combination of the art and science of medicine might evolve, and that in the not too distant future we might, out of the ashes of our turmoil, produce someone who might in the history of our profession be found not unworthy to stand in the company of Baglivi, Boerhaave, Sydenham and Osler.

It is a lack of confidence, more than anything else that ruins a community. We can destroy ourselves by disillusion just as effectively as by bombs. As a profession we have a great tradition, and it is a tradition in which in its great periods the care of the indivdual, rather than the cold science of medicine has dominated.

To-day in our community
Things fall apart: the centre cannot hold
Mere anarchy is loosed upon the world.
The blood dimmed tide is loosed, and everywhere
The ceremony of innocence is drowned.
The best lack all conviction, whilst the worst
Are full of passionate intensity.

Yet in medicine we rise above the ebb and flow of senseless passion for we are part and play our role in the great whole which we call nature.

We must never forget that in the beginning Hippocrates was the great ecologist – that he saw man whole in relation to the whole of nature. Incidents and circumstances not infrequently lead to depression and anticipation of the day of doom, but in the ultimate from man's great genetic pool leaders have arisen, and will arise again, to point the way to sanity and progress.

Ever from the dying Phoenix, says Cranmer to Henry VIII, has arisen one

"Who from the sacred ashes of her honour
Shall star-like rise, as great in fame as she was
And so stand fixed. Peace, plenty, Love, Truth, Terror
That were the servants to this chosen infant
Shall then be his, and like a vine grow to him
Wherever the bright sun of heaven shall shine
His honour and the greatness of his name
Shall be, and make new nations: he shall flourish
And like a mountain cedar reach his branches
To all the plains about him. Our childrens' children
Shall see this and bless heaven.

And so I hope that in the world of modern medicine we may see in the not too distant future, and preferably in our own small community, a physician who will fuse for the benefit of humanity the conflicting concepts – born so long ago into the very origins of our profession in the schools of Cos and Cnidos. "The printed science of our profession can become more worshipped than the actual art of its dispensation to the sick, but the statue of Asklepios is of no avail if its spirit dies".

A STUDY OF NEW PATIENTS ATTENDING THE ACCIDENT AND EMERGENCY DEPARTMENT OF THE ROYAL VICTORIA HOSPITAL, BELFAST, from 25th January, 1970, to 31st January, 1970

by **W. H. RUTHERFORD, F.R.C.S.,**
Medical Assistant in Surgery, Accident and Emergency Department,
Royal Victoria Hospital, Belfast

INTRODUCTION

IN VIEW of the great paucity of information about the work of accident and emergency departments, it was decided to undertake a detailed study of all new patients attending the accident and emergency department of the Royal Victoria Hospital over a period of one week. The aims were:

(a) to make a critical analysis of the work of the department;
(b) to provide figures for planning and development
(c) to estimate the value of accident and emergency records for clinical research.

METHODS

Population studied

From 25th January, 1970, to 31st January, 1970, 1,007 case papers were prepared for new patients. Of these 5 walked out before examination, 2 were discovered to be re-attending who had mistakenly asked for new papers, and 8 were transferred to another department of the hospital without examination (mostly to the eye, ear, nose and throat departments of the hospital). This leaves 992 patients who form the basis of the study.

Recording

During the week chosen, receptionists and doctors were asked to enter all details with special care. After typed copies had been made for the continued care of the patients, 29 items were coded on the original documents. Punch cards were prepared from the coded column and sorted mechanically. Originally all tables were prepared subdivided both by sex and by the area where the patient was examined. Where no important difference was seen the subgroups were later amalgamated.

Examination areas

Patients were seen in two distinct areas. The more serious cases (those being assessed to see whether admission was necessary) were seen in an area which we call the ambulance area. The area for the less serious cases is called the walking area.

RESULTS

Age and sex (Table I)

In the ambulance room, the proportion of men in the groups above 65 years of age was much higher than corresponding groups for the Northern Ireland

population. For women patients this over representation of the elderly was not obvious till 75 years old and above. By contrast in the walking area the youngest groups were over represented with the whole population, and the elderly were markedly under represented, this being evident above 55 years of age.

TABLE I

Percentage distribution of 992 patients by sex, examination area and age, compared with Northern Ireland population of 15 years old and over

	PERCENTAGES					
	Ambulance Area		*Walking Area*		*N.I. Population*	
	M	F	M	F	M	F
15–24	22.0	22.9	42.7	32.2	23.3	21.2
25–34	12.5	11.8	23.8	19.7	17.1	16.0
35–44	10.4	11.0	14.5	14.0	16.4	15.8
45–54	14.5	13.5	7.8	16.4	16.2	15.6
55–64	13.8	12.7	7.4	10.6	13.9	14.4
65–74	19.3	10.2	3.4	4.3	8.8	10.8
75–84	4.9	13.6	0.2	2.9	3.5	5.1
85+	2.8	4.2	0.2	–	0.7	1.1
Total Percentages	100.2	99.9	100.0	100.1	99.9	100.0
Total Numbers	151	123	479	239	501,500	551,500

Home address

Greater Belfast was subdivided into 5 areas – central, north, south, east and west. Central consisted of postal districts 1–3, east of postal districts 4–6 with Holywood and Dundonald, south postal districts 7–10 and Dunmurry, west postal districts 11–13 and north postal districts 14–15 with Glengormley and Carnmoney.

Ambulance area. Only 0.4% of patients had home addresses in central Belfast – this is almost entirely a non-residential area. 32.9% of patients had home addresses in West Belfast – a district which is both highly populated and close to the hospital. East Belfast, though across the river Lagan, and having the Ulster Hospital within its area, accounted for 23.3% of the patients. North Belfast, which includes Whiteabbey Hospital and the Mater Infirmorium Hospital, accounted for 20.9% of patients. Only 13.1% came from South Belfast. This reflects both its lower population and the presence of the Belfast City Hospital. 3.9% of patients came from Co. Antrim, 1.5% from Co. Down and in 5% the home address was further afield.

Walking area. 49.0% of patients came from the adjacent area of West Belfast, 19.5% from North Belfast, 11% from East Belfast and 8.4% from South Belfast. Proximity naturally affects walking patients much more than ambulance patients.

Location of General Practitioner's Surgery

Figures were extracted for Belfast, Co. Antrim, Co. Down, Co. Armagh and

elsewhere. Belfast was subdivided into an area immediately adjacent to the hospital (postal districts 11 and 12) and the rest of Belfast.

The total number of practices in each area was counted, and the number of these practices from which patients attended during the week. The percentage of practices in each area from which patients attended was worked out. In this one week, patients were received from 8.1% of practices in Co. Armagh, from 26.7% of practices in Co. Down, from 52.9% of practices in Antrim and from 86% of practices in Belfast. Patients were received from every practice in Belfast 11 and 12, and from 82% of practices in the rest of Belfast.

It must be understood that this is a classification by the location of the general practitioner's surgery regardless of whether patients were referred by their doctor or attended on their own initiative. Half of those with Co. Down G.Ps. attended on their own initiative, compared with 39.7% from Antrim, 65.8% from Belfast 11 and 12, and 49.2% from the rest of Belfast.

As the patients had been coded by a suitability index this was also analysed by location of G.Ps. surgery. Of cases from Belfast 11 and 12 64.7% were considered as obviously suitable. This compared with 67% from the rest of Belfast, 68.2% of Co. Antrim patients and 73.5% of Co. Down patients. Although the department is used much more by nearby patients and doctors there is no evidence here that it is misused more by those living near.

Transport

In the ambulance area 57.3% of patients came by ambulance, 21.9% by private car, 11% by bus, 6.2% walked in and 3.3% came by taxi.

In the walking area 36% came by private car, 33.7% by bus, 20.8% walked, 4.7% came by ambulance and 4.2% by taxi.

Source

Ambulance area. Here 60% of women and 41.1% of men were referred by their own doctor and 31.8% of men and 19.5% of women came on their own initiative. In all 15.9% of men and 10.6% of women were brought in after a 999 call.

Walking area. From this area 68.5% of men and 62.3% of women came on their own initiative. 25.1% of women and 10.9% of men came from their doctor, and 16.3% of men and 7.5% of women were sent from work.

Specialty

In the ambulance area patients were classified by specialty according to the doctor who made the decision about the disposal of the case. 46.7% of cases were surgical, 44.2% were medical and in 9.1% of cases a registrar of some other specialty was called in to make the decision.

In the walking area nearly all cases were dealt with by house officers. Here the specialty was decided from the diagnosis. It was considered that 88.2% of cases were surgical, 3.6% medical, 5.3% dental and 2.9% were from other specialties, mainly E.N.T. and Dermatology.

Diagnosis

Medical cases. The medical cases in the walking area are ignored, being very few, and an incorrect use of the service. Table II gives the percentage distribution of the 121 medical patients in the ambulance area. By far the largest group was diseases of the cardiovascular system (46.3%). Even if cerebro-vascular disease (9.1%) is subtracted, there were still 37.2% due to heart conditions and 26.4% of the patients had ischaemic heart disease. In an accident and emergency department it is not possible to diagnose all cases immediately and 18.2% had to be given diagnoses like abdominal pain, chest pain, etc.

TABLE II

Percentage distribution of 121 *medical patients seen in ambulance area*

Diseases of cardiovascular system:		
Ischaemic heart disease	26.4	
Cerebro vascular disease	9.1	
Other cardiovascular diseases	10.8	
		46.3
Diseases of respiratory system		11.6
Self poisoning		6.6
Ill-defined conditions		18.2
All other diagnosis		17.4
		100.1
TOTAL PATIENTS 121		

TABLE III

Analysis of 761 *surgical patients by diagnosis*

	Ambulance Area		*Walking Area*	
	M	F	M	F
Trauma	43.0	30.2	82.6	82.2
Superficial Sepsis	1.5	4.8	6.0	9.4
Other	55.5	65.0	11.4	8.4
Total Percentages	100	100	100	100
Total Patients	65	63	431	202

Surgical diagnoses. Table III shows the percentage distribution of surgical cases. It will be seen that accidents accounted for 43 % of men and 30.2% of women with a surgical diagnosis in the ambulance area. The remainder had mainly disorders of the gastro-intestinal tract.

In the walking area approximately 82% of men and women with a surgical diagnosis had had accidents. Superficial sepsis was present in 6% of men and

9.4% of women. The rest were mainly conditions of the musculo-skeletal system like tennis elbow, de Quervain's disease or low back pain.

Disposal

Ambulance area. From this area 49.6% of cases were admitted to the Royal Victoria Hospital and 4.4% to other hospitals. This figure was affected not only by the seriousness of the cases but the availability or otherwise of beds in hospital. As many as 23.4% were sent home and the general practitioner requested to continue caring for them. Of the 12.8% referred to externs, some were cases which should have been sent there in the first place, but many were cases which were very near to needing admission and for whom urgent appointments were made within one or two days.

Walking area. A few cases were admitted from this area (4.4%). Most went back to their general practitioner (52.7%). Of the 30.6% recalled some were for dressings and some for further assessment.

Suitability for Treatment in the Accident and Emergency Department

Table IV has to be taken with caution. The assessments were made on the spot by the doctor handling the case. Most of these were junior doctors. No hard and fast criteria were agreed in advance, so the judgements were very subjective.

TABLE IV

Percentage distribution of 992 patients by examination area and by suitability

	Ambulance Area	*Walking Area*
Clearly suitable for Accident and Emergency Department	77.0	62.7
Possibly for G.P.		1.5
„ for Factory Medical Department		0.3
„ for Extern	0.7	0.8
„ no examination necessary	1.1	10.0
Clearly for G.P.	10.2	10.7
Clearly for Factory Medical Department		1.9
Clearly for Extern	9.9	3.3
Clearly no medical help needed	0.7	3.8
Missing data	0.4	4.8
Total percentage	100.0	99.8
Total patients	274	718

In the ambulance area it was felt that 9.9% of cases should have been dealt with at extern, and 10.2% by general practitioners. It was accepted that 77.0% of cases were clearly the correct type for this department.

In the walking area where a higher percentage of patients came on their own initiative, 62.7% were accepted as clearly suitable, 10.7% were felt to be cases

which should have gone for attention to their general practitioner. It is noteworthy that in 13.8% probably no examination or treatment was necessary.

Discussion

Most recent reports suggest that the accident and emergency departments are being grossly misused. To evaluate this in relation to this study, it is again wise to separate the ambulance area patients from the walking area. The ambulance area patients can be assessed in two or three ways.

It is sometimes suggested or implied that in an ideal department no patient would be examined unless they had first been seen by their own doctor. By this criterion 41% of men and 60% of women correctly used the service in the ambulance area and 10.9% of men and 25.1% of women correctly used it in the walking area. This does not however stand up to careful examination. Nobody would deny that the 999 calls were correctly brought directly to hospital. And a man at work or on the street who gets a severe chest pain, if he is near a hospital with a good accident and emergency department, should go straight to it.

Of the minor complaints too, is it not correct for a patient with a bad laceration or sprained ankle to go directly to hospital? I can see no benefit to the patient or the medical services in insisting that such patients should first contact their own doctor.

It is not denied that a proportion of the 55.3% who come on their own initiative may be misusing the service. But to my mind, that they come on their own initiative is no automatic proof of misuse.

A more direct indication is given in the suitability ratings. It must be remembered that these were subjective judgements mainly by junior doctors who probably had little first hand experience of general practice. Of ambulance area patients 77% were deemed clearly the work of this department. Roughly 10% were considered patients whose cases should have been dealt with by their G.P. and 10% should have been sent to externs. The remainder were acknowledged as being equivocal cases. These figures would bear out my own impressions from working for 4–5 years in the department. While many of the cases of misuse are among self-referred patients, there are also some general practitioners who misuse the service.

Turning to the walking area patients, here 10% of cases are said to be clearly suitable for their own doctor, and 10% needed no treatment. On cross checking this with the type of case using the department, 3.6% are seen to be medical cases. A good many of these have suddenly developed a rash. If they cannot contact their own doctor they walk into hospital. It is very understandable, but a clear case, I think, of misuse of the hospital.

Of the surgical cases, I would have no hesitation in accepting all the trauma (82%), no matter how trivial. It is impossible that patients should always know when something is trivial and when it is serious. If they are worried they should consult a doctor. And in trauma cases the hospital is the right place to do this if it is not too far away. Superficial sepsis (9.4%) is also very suitably dealt with in hospital. The 8.4% of other cases will include conditions like low back pain, plantar fasciitis, de Quervain's disease, hydrocœle, paraphimosis. Some of this

should have been referred to orthopaedic externs, though in this case I can sympathise with the desire to have cases screened so that all urgent cases may be passed on urgently to the orthopaedic department. Scrutiny of the diagnoses would therefore suggest that in the walking area some 90% of patients are correctly using the service, 5% are equivocal and 5% are definitely misusing the service.

How does one deal with the situation? The remedy, I suggest, lies in the hands of the doctors in the department. The cardinal rule is that a person who misuses the service should get no benefit through so doing. When a doctor sends a patient who quite clearly should have been sent to an extern clinic, no appointment should be made, but the patient returned to the doctor with a request that he make the appointment. When a patient who should have gone to his own doctor comes to hospital, he must always be examined by a doctor. But this doctor will give no treatment and also no information about the findings of his examination except that this is not a hospital case, and he must see his own doctor. Such a policy consistently applied will reduce misuse to small proportions. That it is so large at present is an indication of our own failure.

Summary

An analysis has been made of 992 new patients attending the accident and emergency department of the Royal Victoria Hospital in the last week of January 1970. In the light of the findings the question of the misuse of accident and emergency services is discussed.

JOHN ALEXANDER SINTON, V.C., F.R.S.
Soldier, doctor and scientist

by MAJOR GENERAL ALBERT SACHS, C.B., C.B.E., M.Sc., M.D., F.R.C.P., F.R.C.Path.

THE SIR THOMAS AND LADY EDITH DIXON MEMORIAL LECTURE

delivered before the Ulster Medical Society, 11th November, 1971

May I say what a great privilege and honour it is for me to pay homage to the memory of a very remarkable man, a far seeing man of many parts and varied experiences who had the unique distinction of being the only holder of the Victoria Cross who was also a Fellow of the Royal Society and one who became a legend in his own life time. I shall try and present a portrait of John Sinton against the background of events and problems of his times. I first met him when I had the good fortune to work with him at Kasauli, India, while on study leave in 1932 and 1933 when investigating the aetiology of sandfly fever. I soon realised his critical mind, since on his advice I cancelled a paper already in print about a spirochaete isolated from a case of sandfly fever. How right he was when two years later the virus aetiology of sandfly fever was established. Some years before I had heard about John Sinton's bravery. In 1929 and 1930 when stationed at Jubbulpore, Central India, I became acquainted with the British Officers of the 1st (P.W.O.) Battalion of the 17th Dogra Regiment (prior to 1922 the 37th Dogras). From these and their Commanding Officer Bt. Colonel (later Major General) F. L. Nicholson, D.S.O., M.C., I had an account of the brave deeds of their war time Regimental Medical Officer, for which he was awarded the Victoria Cross*. I have other links with John Sinton in that I was on active Service in Wazirstan in 1928 – only seven years after his own experience, and then again in 1942 and 1943 when serving with the 10th Army in Persia and

FIG 1. *John Alexander Sinton,* V.C., O.B.E., M.D. (*honoris causa*). D.S.C., F.R.S., D.T.M.
Brigadier Indian Medical Service
2nd December, 1884 – *25th March,* 1956

*In 1929, when a judge at a St. John's Ambulance Competition for members of the Bengal-Nagpur Railway, I met another legendary doctor, their Chief Medical Officer, Lieut.-Colonel A. Martin-Leake, the first ever to receive a bar to a Victoria Cross.

Iraq I had an opportunity of visiting the battlefields around Kut. During this period I met Sinton again when visiting Cairo. I also had the good fortune to share an office with Brigadier Hugh Mulligan, I.M.S., Consultant Malariologist to Paiforce, who Sinton regarded as his closest friend and most long lasting collaborator. To him I am indebted for a first hand account of Sinton's scientific and professional achievements.

John Alexander Sinton was born on the 2nd December, 1884, at Victoria, British Columbia, the third of seven children of Walter Lyon Sinton and Isabella Mary Sinton (nee Pringle). His father's people, the Sintons, were of original lowland Scottish origin, had settled in Co. Armagh, Northern Ireland, for more than 250 years. The family came to Ulster in 1890, when Sinton was about six years old. The family were never in affluent circumstances. His father was a linen merchant, but it was to the hard work and devotion of his mother, for whom he had a deep affection, that Sinton ascribed any success the family may have had.

School Days and Medical Education

Sinton was educated at the Nicholson Memorial School, Lisburn, Co. Antrim, from the age of 9–15 and at the Royal Belfast Academical Institution for the next three years when he matriculated. After a year at the Arts School of Queen's College, Belfast, where he was an exhibitioner, he obtained first place and honours. He then entered the Medical School of Queen's College, and had a distinguishd academic career obtaining prizes and honours in nearly every subject or examination he went in for. He graduated M.B., B.Ch., B.A.O. (Royal University of Ireland) in October, 1908, taking first class honours in Medicine, second class honours (first place) with exhibition in Surgery, and first class honours with exhibition in Midwifery and Gynaecology. After qualifying he held the posts of House Surgeon and House Physician at the Royal Victoria Hospital, Belfast, Riddell Demonstrator in Pathology and Pathologist to the Benn, Ulster, Eye, Throat and Ear Hospitals, Belfast, and to the Mater Infirmorum Hospital. While at Queen's University, Belfast, he took the D.P.H. (Belfast) in 1910 (first place and prize), and later the same year the D.P.H. (Cambridge), and the D.T.M. (Liverpool University) in 1911, again taking first place. He took a keen interest in the University O.T.C. He applied to join the Indian Medical Service on July 7th, 1911, sitting for the entrance examination on 24th July, 1911, taking first place. He was gazetted Lieutenant 29th July, 1911.

Professor T. H. Millroy, Dean of the Medical Facility, Queen's University, Belfast, in support of his application to join the Indian Medical Service, wrote to the Under Secretary of State for India, Whitehall, London, S.W.: "I beg to inform you that this Gentleman was one of the most distinguished students of recent years in this University. His character, conduct and professional ability are and have been of the highest. He acted as demonstrator in the Pathological Department of the University where he was most highly esteemed. I regard him as eminently fitted for the very important Service which he desires to join (Indian Medical Service)". Similar supporting letters were received from Professor W. St. C. Symmers, Professor of Pathology, and Dr. W. James Wilson, lecturer in Hygiene and Sanitary Science, both at Queen's University, Belfast.

Military Service 1911–1921

Pre-World War I

The Indian Medical Service offered many attractions to young doctors desiring an active life abroad. The service had two branches, one *Military* with duties in relation to the Indian Army very similar to those of the Royal Army Medical Corps in the British Army, and the other *Civil* responsible for the health of the civil population and where there were greater opportunities and wider choice for professional work, including professorships in colleges and in research. Newly commissioned officers had in all cases to serve for a minimum of two years (latterly it was six or seven) in the military branch, usually at first as a regimental medical officer, before transferring to the civil branch.

Prior to proceeding to India, Sinton was seconded for a year to study protozoology at the Liverpool School of Tropical Medicine. Here he became acquainted with Sir Ronald Ross, who had served in the Indian Medical Service until 1899. This was the era when the mysteries of tropical medicine were being unravelled by pathologists of the British and Indian Armies and it would be difficult to overestimate the influence of men like Bruce, Ross, Leishman, Semple, Christophers and Rogers on the course of tropical medicine and pathology. It is not unlikely that his associations with Sir Ronald Ross acted as the stimulus to follow in their footsteps and solve some of the mysteries connected with the transmission and treatment of protozoal infections. But owing to the outbreak of World War I and the Afghan and North West Frontier Campaigns, it was not until 1921 – ten years after joining the Indian Medical Service – that Sinton was seconded to "Civil".

After arrival in India, Sinton was posted to Kohat, North West Frontier Province as Regimental Medical Officer to the 31st (later 13th) Duke of Connaught's Own Lancers. He was also in charge of the Brigade Laboratory. During this period he published a number of papers, one dealing with the treatment of cholera cases by Roger's method, others on the eosinophilia in helminth infections, and the culture of malaria parasites.

On the outbreak of World War I he was medical officer with the Moveable Column, Kurram Valley in the Kohat District, and in October 1915 was posted to the Indian Expeditionary Force D (Mesopotamia) as Regimental Medical Officer to the 37 Dogra Regiment which was mobilising at Jhelum.

Mesopotamia Campaign

The Regiment left for Karachi on the 29th November and embarked on the British India Steamer Muttra which was not very large. She also carried half the 97th Infantry and all the regimental mules and was consequently overcrowded.

A critical situation had developed in Mesopotamia, where after an initial crushing defeat of the Turks below Kut-el-Amara, Force "D" had been required to push on towards Baghdad without receiving any reinforcements or even replacement drafts.

The Mesopotamia Campaign took place in the area of South Iraq lying between Baghdad, the River Euphrates and the head of the Persian Gulf (Fig. 2). This is a flat plain unrelieved by hills or any prominent feature, described by soldiers

as two ruddy long rivers surrounded by miles of Sweet Fanny Adams. Climatic conditions are extreme. In summer the shade temperatures are over 130°F, while in winter it freezes. Cases of heatstroke and frostbite occurred in the same areas. A few hours rain would turn the area into a quagmire. In both wars casualties due to disease was the major problem in this region.

This unfortunate decision was a political blunder and partly due to over optimism and under estimation of the strength and fighting quality of the opposition. General Townsend's force retired to Kut, and was invested there.

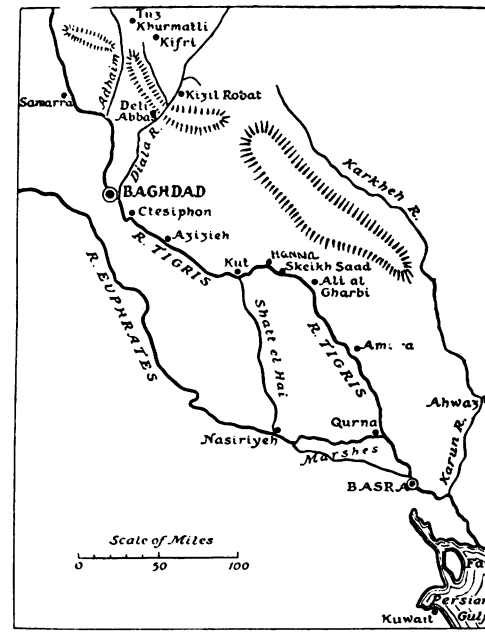

FIG. 2. *Map of Mesopatamia.*

The medical organisation has come in for much criticism. Medical units proved totally unable to deal with the large number of sick due to trying heat and insanitary camps in addition to battle casualties. The situation began to improve in May 1916 when the organisation was overhauled and fresh units arrived from France.

On 7th December the Muttra reached the mouth of the Shat-el-arab, and after being grounded three times reached Basra the next evening. The regiment was ordered forward at once to Amara to join the 35th Brigade, commanded by Brigadier General Rice and attached to the 7th (Meerut) Division.

First attempt to relieve Kut

The regiment did not land at Basra, but were transhipped into tightly packed lighters in tow which arrived at Amara five days later on 16th December, after a day at Amara the 35th Brigade commenced the march for Ali al Garbi where the Tigris relief force was concentrating. The Turks had entrenched themselves astride the River Tigris below Shaikh Saad. The Tigris Force came in touch with the enemy on 6th January. The 7th Division composed of the 19th, 21st and 35th Brigades attacked the Turkish positions on the left bank and the 28th Brigade and the 92nd Punjabis attacked on the right bank. The battle of Shaikh Saad lasted through the 6th, 7th and 8th January after which the Turks retired. Our casualties were severe; they amounted to 4,007 including 133 British Officers. Of this number, 90 British officers, 900 British other ranks and 2,500 Indian other ranks were admitted to medical units during the 6th, 7th and 8th January. In the regimental history it is recorded that the 37th Dogras had lost heavily, one British officer killed, 3 British officers, including the Medical Officer, Captain Sinton, and 4 Indian officers wounded, and 240 casualties in other ranks, 32 of

FIG. 3. *Photograph of the painting of the Battle of Shaikh Saad, in the V.C. Room of the R.A.M.C. Headquarter Mess, London, showing the wounded Captain J. A. Sinton, I.M.S., attending to a battle casualty.*

whom were killed. Captain Sinton's energy and devotion to duty were outstanding. Early in the action he was shot through both arms and the side. Disregarding his own wounds, he worked magnificently, and toiled on until all the wounded, including those of neighbouring units, had been brought in and treated (Fig. 3). Much to the Regiment's satisfaction his splendid work was rewarded with a well earned V.C.

The Turkish force had retreated to a position on the Wadi river about 8 miles above Shaikh Saad, and Tigris force followed it up and attacked this position on the 13th January. The 6th Cavalry Brigade and the 7th Division were sent to try and outflank the enemy's left. This turning movement was not successful. The enemy retired from the Wadi river on the night of the 13th/14th January and took up another and stronger position 3 miles in the rear of Hanna and entrenched themselves. The British losses at Wadi were 1,601 casualties including 40 British officers.

El Hanna was a far more formidable position than Shaikh Saad and the Wadi. The operations were rendered most difficult on account of the rain and heavy mud. On the 20th January an ineffective bombardment was carried out on the Turkish lines, which were within 500 yards of our own front. The 7th Division were ordered to attack on 21st January after a short bombardment. The attack failed, and an armistice for 6 hours was arranged the next day to bring in the killed and wounded. The British casualties numbered 2,741, including 70 British officers. Owing to heavy casualties the 37th Dogras ceased to be a fighting

formation for some time. Six of the British officers were killed or wounded and the seventh suffered from bad shell shock. It is recorded that a notable feature of the action was the amazing devotion to duty of Captain Sinton who, still in much pain from his wounded arm, worked away all that night and the next day, his gallantry winning the grateful thanks of all ranks of many units. The 9th Brigade, which included the 62nd (1/1st) Punjabis was in support of the 35th Brigade during the attack. The 62nd also suffered very heavy casualties including their Commanding Officer killed. The senior surviving officer assumed command and Captain (later Field Marshal Sir Claude) Auchinleck became acting Adjutant. He told me recently how vividly he still remembered this attack and the absence of trench mortars and heavy artillery support, which contributed largely to the failure of the Hanna attack and marked the end of the first phase of the relief operations.

After the repulse at Hanna the 7th Division spent February in holding the enemy and reorganising. The 35th Dogras were joined by the 41st Dogras which had also suffered severely and were provisionally amalgamated forming the composite Dogra Battalion. On 8th March there was an unsuccessful attack by 7th Division on the Dujaila Redoubt. The number of casualties collected by medical units totalled 2,500. The 35th Brigade had to cover the retirement on 9th March. Captain Sinton again did magnificent work. Accompanied by his Dogra orderly, he insisted on going out between the lines even before dark to help the wounded Gurkhas and ensure they were brought in before the rear party moved off.

For the next seven months the strategic position remained unchanged. In May there was an outbreak of cholera which claimed the Commander of the 35th Brigade as one of the victims, but inoculation and Captain Sinton's rigorous precautions prevented the disease reaching epidemic proportions. Shortly afterwards he was invalided to India.

On 21st June 1916 the award of the Victoria Cross to Sinton was Gazetted. This award was especially well merited as it covered several actions over a period of some sixteen days' continuous fighting when he was wounded. The citation in the London Gazette is given in Figure 4 (page 23).

In the same campaign he was Mentioned in Despatches four times, and was awarded by the Russians the Russian Order of St. George.

Other theatres of war, the Third Afghan War and the Waziristan Campaign

On his return to duty he was on further active service in various theatres of war until 1921 when he transferred to the Civil branch of the Indian Medical Service. He was for a time Sanitary Officer with the acting rank of Major in the 1917 operations against the Mahsuds who were one of the two main tribes in Waziristan, the other was the Wazirs. Both tribes had been trouble makers on the North West Frontier for very many years, often aided and abetted by the Afghans. Waziristan (Fig. 5) is an inhospitable country, for the great majority the stoney fields and lean hardy flocks yielded little beyond the bare necessities of life. This led to raids and plundering of the villages in the plains. The operations were successfully concluded. Then followed a period of comparative peace from 10th August 1917 until the outbreak of the third Afghan War on the 6th

May 1919. During this period Sinton served with the East African Force (Tanganyika) and then with the East Persian Cordon Field Force, commanding a Cavalry Field Ambulance. From August 1918 to April 1919 he was Senior Medical Officer Turkistan Military Mission and commanding a Cavalry Field Ambulance with the rank of Lieut.-Colonel.

In 1919 Queen's University of Belfast conferred the honorary degree of M.D. on him in recognition of his early academic distinctions and of his valour in the field. He was also promoted brevet major in the same year.

Habibullah Khan Amir of Afghanistan was a faithful ally of the British, and it was to his personal influence that Afghanistan was kept out of the war, and the threat to peace on the frontier removed. Unfortunately, while on a shooting trip in the Laghman valley he was assassinated in October, 1918. The subsequent struggle for power leading to the accession of Amanulla as Amir, set off a chain reaction and general unrest resulting in the outbreak of the third Afghan war on 6th May 1919 and the subsequent Mahsud Campaign of 1919–20 and the Waziristan Campaign of 1920. During these campaigns Sinton was D.A.D.M.S. Sanitation, and once again distinguished himself, being awarded the O.B.E., two mentions in despatches, and the Indian General Service with three clasps.

This was however not the end of unrest on the North West Frontier which continued until 1939. There were no fewer than seven campaigns for which medals

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FOURTH SUPPLEMENT
TO
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Of TUESDAY, the 20th of JUNE, 1916.

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WEDNESDAY, 21 JUNE, 1916.

War Office,
21st June, 1916.

His Majesty the KING has been graciously pleased to award the Victoria Cross to the undermentioned Officer and Man:-

Capt. John Alexander Sinton, M.B., Ind. Med. Serv.

For most conspicuous bravery and devotion to duty. Although shot through both arms and through the side, he refused to go to the hospital, and remained, as long as daylight lasted, attending to his duties under very heavy fire.

In three previous actions Capt. Sinton displayed the utmost bravery.

FIG. 4. *The London Gazette*
Original citation of Victoria Cross

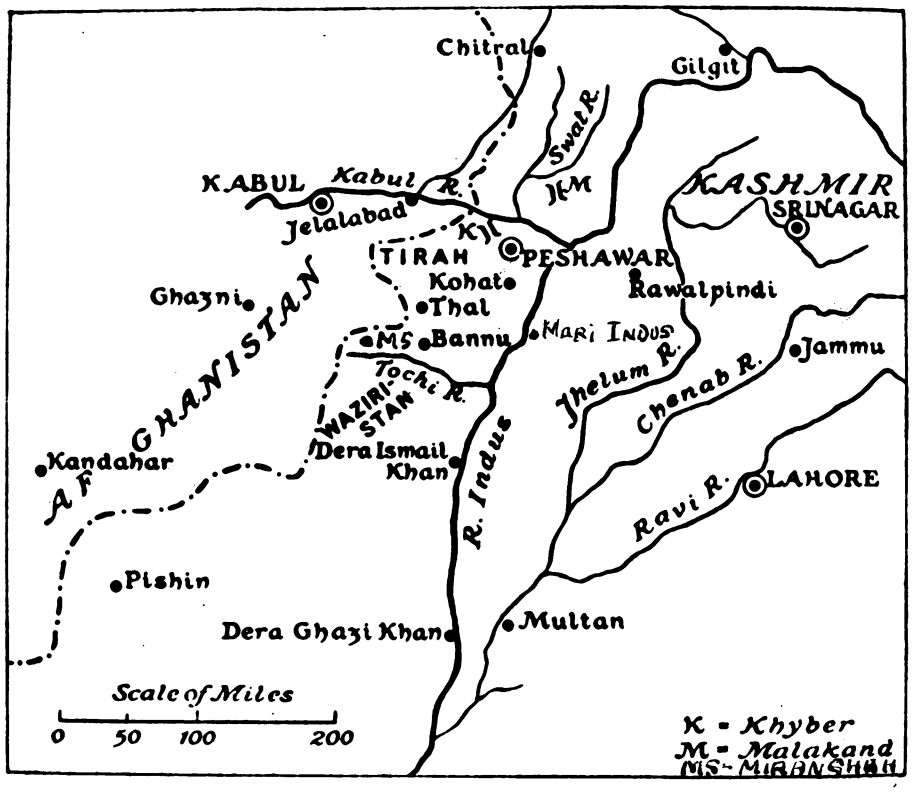

FIG. 5. *The North-West Frontier*

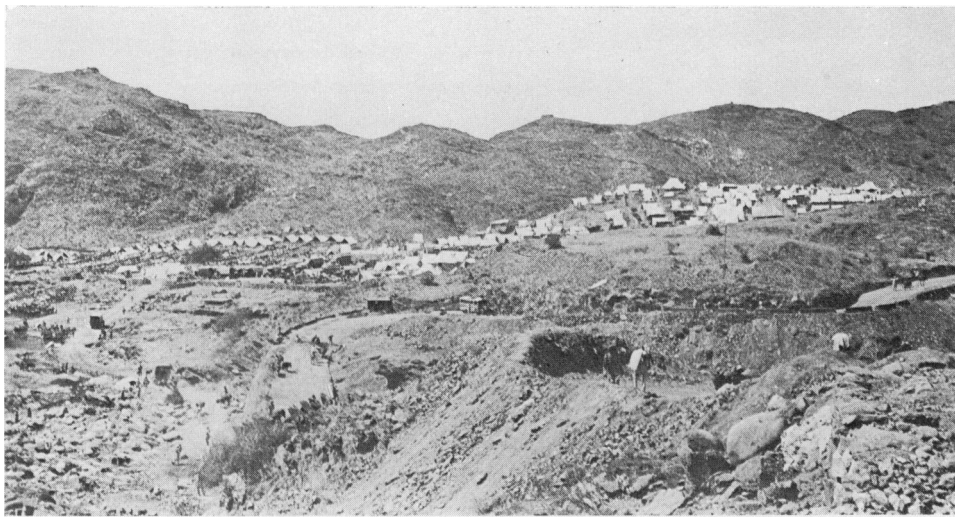

FIG 6. *Column camp near Miranshah, Waziristan,* 1928.

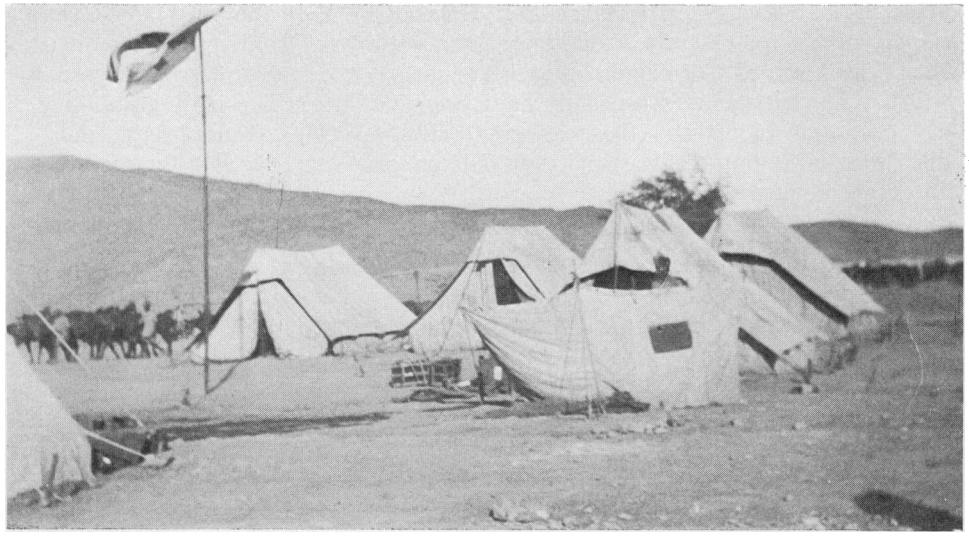

FIG. 7. *Regimental aid post near Miranshah, Waziristan,* 1928.

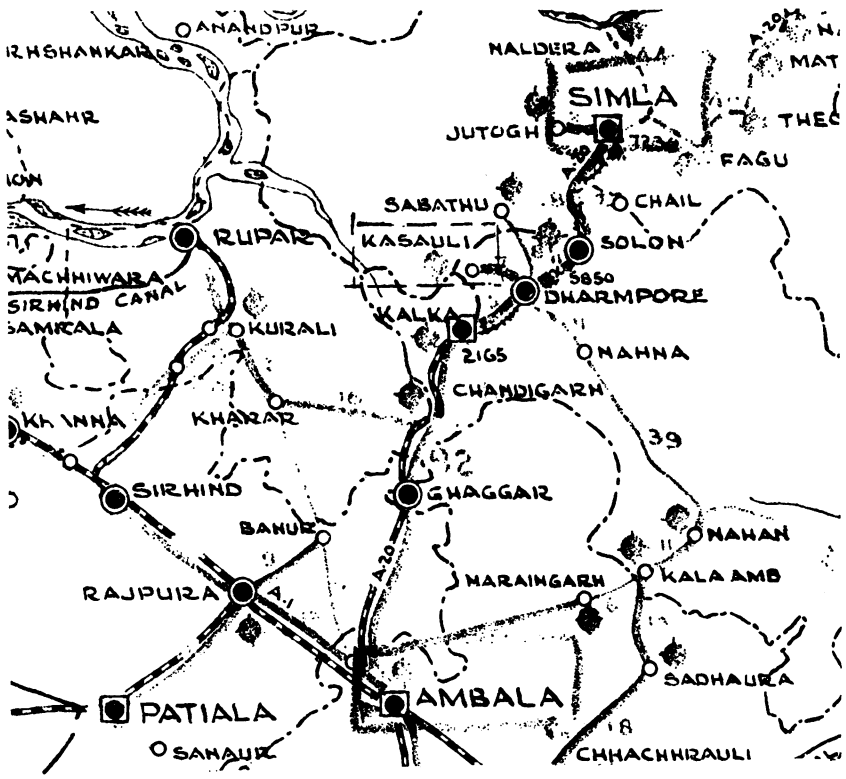

FIG. 8. *North-east Punjab showing Simla-Kasauli region.*

or clasps were awarded. In March 1928 I was R.M.O. to the 6th D.C.O. Lancers as part of Bannu Column. Conditions then were very similar to those existing when Sinton served there some seven years earlier. We had to carry our casualties with us; any left would most likely have been mulilated. The photograph (Fig. 6) of the column camp and the regimental aid post (Fig. 7) near Miranshan, 37 miles west of Bannu Cantonment, will I hope give some idea of the terrain that Sinton encountered.

Civil Employ 1921–1936

After a period of leave home, during which he worked under Professor Newstead studying sandflies of the genus *Phlebotomus* he must have had a personal interest in this pest, since he must have been frequently bitten in Waziristan, and under Professor Thomson on protozoology, Sinton returned and was taken on the cadre of the Medical Research Department, being attached to the Pasteur Institute, *Kasauli* from 8th February to 19th July 1921.

Kasauli where Sinton was to carry out his investigations for the next 15 years until his retirement in 1936 is a hill station 46 miles south of Simla (Fig. 8): too close to administrative authority for some officers! The Central Research Institute at Kasauli was the Government of India's premier laboratory for medical research and vaccine production. It was administered directly by the Government of India. Colonel Sir Richard Christophers was Director for about ten years. He was succeeded by Lt.-Col. (later Major General Sir) John Taylor who held the post for about eight years, and was in turn succeeded by Colonel H. Mulligan, I.M.S., who was Director from 1943 until partition in 1947. It is to him that I am greatly indebted for much of the information during this period of Sinton's career.

The Pasteur Institute of India to which Sinton was attached in 1921 occupied a separate site in Kasauli from about 1903 until 1936 when it was absorbed into the Central Research Institute and housed in a new building on its site. The old building became a sanatorium. Lt.-Col. (later Major General Sir) Gordon Covell was the last director of the independent institute. It is of interest that Lt. Col. Sir David Semple who was commissioned in the Army Medical Service in 1883 was Director of this Institute from 1900 to 1905 and then Director of the Central Research Institute from 1905 to 1913. This institute was administered by a governing body, and financed partly by endowments and partly by the sale of anti-rabic vaccine.

The Malaria Survey of India was housed in buildings belonging to the Central Research Institute, but in all other respects independent being financed and administered by the Indian Research Fund Association, a body established in 1911, which received a special Government grant, but was largely independent and in many ways resembling the Medical Research Council in England. In 1916 a malaria organisation for India had been put forward and implemented following the Imperial Malaria Conference held at Simla in that year. A Central Malaria Committee and a Provincial Malaria Committee for each of the eight Provinces of India was formed. A Central Malaria Bureau was established at Kasauli under the Central Committee. There collections of mosquitoes, and a reference library were started.

When Sinton returned to India the Central Malaria Bureau had been re-

established at Kasauli, and there were a number of research projects in progress. One of these was the Quinine and Malaria Enquiry, financed by the Indian Research Fund Association. On 20th July 1921 Sinton was transferred from the Pasteur Institute to be in charge of this enquiry. In 1925 sanction was obtained for the establishment of a Central Malaria Organisation for India to be established at Kasauli and to be known as the Malaria Survey of India. Sinton was appointed as the first director, and brought together all the enquiries and investigations under the new organisation. He was director until his retirement in 1936, when he was succeeded by Lt. Col. Gordon Covell, I.M.S. In 1937 the Government of India decided to take over the public health and advisory functions of the Survey, and the whole organisation, now renamed the Malaria Institute of India, was moved to Delhi. As Director, Sinton was ex-officio a member of the Scientific Advisory Board of the Indian Research Fund Association. He was also a member of the Malaria Commission of the League of Nations and Co-ordinating Officer for this body. In 1929 the Malaria Survey issued the first number of its journal, Records of the Malaria Survey of India, now the Indian Journal of Malariology.

Kasauli also accommodated two completely separate military laboratories administered by G.H.Q., India. One the Enteric Laboratory concerned with the identification of organisms of the salmonella group isolated from military cases of enteric fever and the other the Military Food Laboratory dealing with the control of the quality of food supplies for British and Indian troops. Finally there was the British Military Hospital, administered through military channels, and in which was located the Malaria Treatment Centre for India always under the command of an R.A.M.C. medical specialist. This Centre was started in 1924 for the treatment of chronic relapsing malaria cases in British troops. Sinton had no administrative responsibility for the Centre, but was adviser on the treatment to be given, as he in fact laid down the various regimens of treatment. Follow up blood films was done in the Malaria Survey. Not unexpectedly there was at times a clash of personalities. Sinton was senior (in terms of service) to the various specialists in charge of the centre and had their respect, but there were differences from time to time. Nevertheless the work done at the Centre was of the greatest importance and as a result relapsing malaria among British troops practically ceased.

Scientific and Professional Achievements in India

Sinton published more than 200 scientific papers, several in collaboration with others, but in all his genius was always evident in design and direction. He was a big and generous colleague, putting the name of the junior author first when he thought they had made the major contribution. His papers dealt with various aspects of malariology, chemotherapy, parasitology, immunology, laboratory and survey techniques and social aspects. He also published 36 papers on Indian species of *Phlebotomus*, of which he became the leading authority.

It was in Kasauli that he met and married Edith Seymour Steuart Martin on 19th September 1923, and where his daughter was born on 9th December 1924.

Chemotherapy

This has been referred to earlier. When the Malaria Treatment Centre was

started, the routine course for malaria was 30 grains of quinine a day for 90 days. I can assure you from personal experience, this prolonged course of quinine was unpleasant and one suffered from transient deafness and giddiness. As other potentially useful antimalarial drugs became available Sinton undertook controlled research on their possible role in treatment and laid down certain rules as guide lines for the Centre and worked out the requirements for an ideal drug. These are in general use today, but it is doubtful of it is known that they emanated from Sinton.

Plasmoquine (later called pamaquin) was introduced in 1926. This drug was a synthetic compound discovered by workers at the Bayer Chemical Laboratories in Germany in 1924. The effectiveness of this new compound was first demonstrated in canaries infected with *P. relictum*, the parasite of bird malaria. Sinton was the first to point out its value in reducing the relapse rate, and worked out that quinine and plasmoquine combined gave infinitely superior results after a much shorter course. A large scale trial was carried out in 1929 and 1930 in four hyperendemic centres in India. Jubbulpore in central India was one of these, and during this period about a thousand cases were treated. As a result of this extensive trial, the long routine course of quinine treatment for malaria was discontinued and the much shorter and more effective combined quinine-plasmoquine therapy substituted in India.

Sinton added greatly to our knowledge of the value of the newer antimalarial compounds as they became available. Atebrin and plasmoquine was found to be too toxic. No work was done at the Centre on atebrin prophylaxis, and it was not until 1941–42 that the work of Sir Neil Hamilton-Fairley at Cairns, Australia, demonstrated its great value as a prophylactic.

Malaria Parasites of Man

Badly prepared stains and poor staining techniques were and still are the major cause of faulty diagnosis in cases of suspected malaria. Sinton's work was notable for the many contributions he made to improve techniques, particularly the preparation and use of thick films, interpretation of the appearances seen and their use in the identification and enumeration of parasites. In collaboration with E. L. Hutton and P. G. Shute he published papers on infections with *P. ovale*. He also investigated the properties of malarial pigment.

Malaria Parasites of Monkeys

Lieut.-Colonel R. Knowles, I.M.S., Professor of Protozoology at the Calcutta School of Tropical Medicine, had discovered a chronic malarial infection in an Irus monkey imported from Malaya which after subinoculation into Rhesus monkeys, the animals died of a fulminating infection in 4 or 5 days. At that time Mulligan was trying to find an experimental model in a mammal for work on malaria. He had examined large numbers of Rhesus monkeys in Northern India, but never found anything resembling a malaria parasite. In Calcutta he purchased several Irus monkeys, all of which proved to be infected, and eventually proved to be suffering from a mixed infection. One of the parasites he named *P. knowlesi* in honour of its discoverer. Sinton, on his return from a year's study leave, with great enthusiasm

and drive joined Mulligan in his researches, and together from 1930–34 they carried out intensive investigations on the plasmodial infections of the lower primates of the old world. By their studies they were able to learn much about the mechanism of immunity in malaria and the implications of multiple and super-infection and to estimate the effect of treatment on immunity.

Sandflies, Cutaneous Leishmaniasis and Kala-Azar

Sinton's collection of *Phlebotomus* consisted largely of specimens he had caught himself from all over India. When he travelled by train he jumped off at every stop and ran to the "Gents" on the platform to search for sandies. He chose this location because the humidity there was always higher than in other buildings. Between 1923 and 1933 he published 36 papers dealing with the Indian species and also descriptions of species from other countries. Of the 27 species described 16 were new to science including one from Peshawar named by him *P. hodgsoni* in honour of Colonel Hodgson, I.M.S., A.D.M.S. Peshawar District, who had initiated an investigation into the aetiology of sandfly fever. Sinton's descriptions were thorough, dealing with both external and internal structures. Some of the important characteristics used in identification of the different species were the structural features of the pharyngeal armature, and in the female, characteristics of the spermathecae. What delicate dissection this involved!

Besides describing oriental sore in Russian Turkestan in 1921, Sinton in collaboration with Col. H. E. Shortt, I.M.S., was the first to record cutaneous leishmaniasis in a dog in India; canine leishmaniasis having been previously described only from the Mediterranean area.

He was the first to make out a case for the transmission of kala-azar by plebotamus. He noticed that the distribution of kala-azar cases coincided almost exactly with the distribution of *P. argentipes*. The Kala-Azar Commission working in Assam failed to incriminate *P. argentipes* as the carrier, but final proof came later after work by Colonel H. E. Shortt and his co-workers.

First Period of Retirement 1936–39

Sinton retired prematurely in 1936. In his last Confidential Report dated 17th April, 1936, Major General C. A. Sprawson, Director General I.M.S., writes: "Lt.-Col. Sinton has an international reputation as a malariologist. He is most efficient and zealous. He has conducted the Malaria Survey of India to my satisfaction: he conducts classes in malaria training most successfully: and he continues to conduct research work in malaria which is most valuable to India and the world at large." This is fair comment of the international status he had reached in the relatively short period of fifteen years. Much of his later work especially that on *P. ovale* and the newer antimalarial compounds was carried out during this period in England when he worked as Manson Fellow of the London School of Hygiene and Tropical Medicine and at the Ministry of Health Malaria Laboratory at Horton, where unique conditions for such researches existed.

Second Period of Military Service 1939–45

On the outbreak of war Sinton then aged 54½ still being on the reserve of

officers, was recalled for duty in India and commanded a hospital. But on reaching the age of 55 was placed on the retired list and returned to U.K., joining the Home Guard as a private. He was, however, re-employed by the War Office and appointed Consultant Malariologist to East Africa Force on the 30th October 1940, and arrived in East Africa in March 1941. In May 1941 he was transferred to Middle East Forces in the same capacity and held this appointment until April 1943, being given the local rank of Brigadier in March 1942, and touring extensively in many countries which were then under Middle East Command. When Sinton arrived in the Middle East, Mulligan, his old collaborator, was running a Malaria School in Moascar, as O.C. No. 2 Malaria Field Laboratory. The unit was shortly afterwards transferred to Sarafand in Palestine, and set up another Malaria School, and a few months later this moved to the Lebanon. Sinton was a frequent visitor to the unit, but his forthright manner was inclined to upset some senior combatant officers. On 9th December 1941, while crossing Staria Kasr el Ami, Cairo, he was knocked down by a motor car and concussed, and also sustained a severe fracture of the right lower jaw. His close friends say that he was never quite the same afterwards. On vacating this appointment he returned to U.K on 15th June 1943, and retired with the Honorary Rank of Brigadier on 23rd August 1943, but shortly afterwards on 7th September 1943 was re-employed as Consultant Malariologist to the War Office. From March to July 1945 he was on an inspecting and advisory tour to see malaria conditions in Assam, Burma, India and Ceylon and then on to Australia, New Guinea, the Solomon Islands and the Moluccas. Sinton was finally demobilised on 31st August 1945. When he finally retired at the age of 60 he had served for over 30 years of which over a third was spent on active service. But before he retired he made several contributions which were published as helpful reports or circulars by the Army, the Ministry of Health and the Ministry of Transport, giving information and instructions regarding precautions against malaria and treatment These were written with the same meticulous care which is so characteristic of his published work. He received a Mention in Despatches on 23rd June 1943 for his services in the Middle East, and was awarded the 1939–45 Star, Africa Star, Burma Star, Defence Medal and the 1939–45 War Medal.

Final Retirement 1945–56

After his retirement for the fourth time Sinton bought a beautiful place near Cookstown, Country Tyrone, in Northern Ireland. He cut himself from his previous activities and instead began to take part in public affairs, especially those of his old University. He became a member of the Senate in 1948, was Pro-Chancellor in 1952 and President of Queen's University Association 1953–54. He was President of the Queen's University of Belfast Services Club in 1947; Vice-President of the Old Instonians Association 1946–52, and President 1952–53. He was also Honorary Colonel of the University Officers Training Corps, a J.P., High Sheriff for County Tyrone in 1953 and the Deputy Lieutenant in 1954.

In addition to his military honours and awards which have already been referred to, Sinton both during his service and during retirement received academic distinctions and awards for his many notable contributions to science and tropical medicine. In addition to the M.D. (Honoris causa) in 1919, Queen's

University, Belfast, also conferred on him the D.Sc. in 1927. It was for his work on malaria and kala-azar that Sinton was elected F.R.S. in 1946, and in the same year he was Robert Campbell Orator and Medallist of the Ulster Medical Society. He was awarded the Arnott Memorial Medal of the Irish Medical Schools and Graduates Association in 1917, the Chalmers Memorial Medal of the Royal Society of Tropical Medicine and Hygiene in 1929, the Bissett-Hawkins Medal of the Royal College of Physicians in 1944, the Mary Kingsley Medal of the Liverpool School of Tropical Medicine in 1949, and from the Egyptian Government, the Anti-Gambia Memorial Medal in appreciation of his services in the malaria epidemic of 1950. Only a few days before his death the Royal Society of Tropical Medicine and Hygiene had decided to award him their highest honour – The Manson Medal. This was presented to Mrs. Sinton by the President, Professor R. M. Gordon, at the meeting of the Society on 21st June, 1956. At her request, Brigadier Sir John Boyd, Sinton's old friend and colleague, replied on her behalf.

He was made an Honorary Member of the Ulster Medical Society in 1920, and an Honorary Member of the National Malaria Society, U.S.A., in 1930. From 1937–46 he was President of the Malaria Commission of the League of Nations, and from 1943–46 a Member of the Malaria Commission of the Medical Research Council. He was a Vice-President of the Royal Society of Tropical Medicine and Hygiene from 1945–47, and made an Honorary Fellow in 1953 of the newly formed National Society of India for Malaria and Other Mosquito-borne Diseases.

As to his personal qualities, Sinton in his heyday was a glutton for work. He regularly worked 6½ days a week and seldom less than 12–15 hours a day, and was indefatigable until whatever work he had in hand was completed. He was uncompromising in his demands, and as a result was a constant thorn in the flesh to higher authority. Malaria was to him the most important thing in the world, and it should be a first priority. Sinton was very popular socially, and could be the life and soul of a party. He was also a very good bridge player. One cannot improve on the description of Sinton's character written by J.S.K.B. in the Obituary in Lancet, April 7th 1956:

> "He was forthright and outspoken, and did not suffer fools gladly. He loved argument, and his eyes shone with the light of battle. He was indeed a formidable adversary, particularly as he was almost invariably right. But he was the kindest and most generous of souls, whose mind never entertained a mean thought, and whose gospel in life was to give ungrudgingly of his best; a loyal friend in whose company one could never be dull."

Sinton was a man of outstanding physical and moral courage and no respecter of higher personages. His V.C. was no flash in the pan, and there were other occasions when his courage was to be seen. I am indebted to Colonel H. Mulligan for those two anecdotes. He writes: "I remember one Sunday morning in Kasauli getting a telephone call at the laboratory to go at once to Sinton's house, where I was living at the time. I dropped everything and ran the mile or so to the house. The servants' quarters had collapsed under the heavy rains, burying three young children. When I arrived Sinton was digging furiously among the debris with his bare hands with rocks and rubble dropping all round him; he had unearthed one child, and I was instructed to start artificial respiration. In the end

all three were dug out and two of them survived. I shall never forget the sight of Sinton drenched with rain, covered in mud, bleeding from a scalp wound, and digging feverously like a terrier after a fox."

"On another occasion a krait (one of the most poisonous snakes in India) was about to drop off a hanging basket on to a departing guest. In a flash Sinton had it by the back of the neck. He admitted to being frightened on such occasions, but his sense of *duty* was so strong, that he never hesitated to put himself at risk."

He was able in his retirement to have time for hobbies he neglected during his busy life overseas, and was very enthusiastic with his gardening, fishing and ornithology. These were probably the happiest days of his life, but the last few years were marred by the considerable suffering from an incurable disease borne with indomitable courage.

He died on March 25th 1956, at his home in Cookstown, Northern Ireland, at the age of 71, and was buried with full military honours among the mountains near his home.

There is no more fitting finale to the Sinton saga than an adaptation of a quotation from the speech made by Henry Lee about George Washington in the House of Representatives in 1799.

Brigadier John Sinton, V.C., F.R.S., was first in war, first in peace, first in the hearts of his colleagues, in fact first in everything he undertook, but above all, first in his own heart was concern for the sick and wounded soldier and sepoy, and his love for children and animals.

Acknowledgements

It is a great pleasure to acknowledge my thanks to the *Director General Army Medical Services* for allowing access to documents relating to Brigadier J. Sinton's service as Consultant Malariologist during the 1939–45 War; *Mr. A. J. Farrington* of the India Office Record Section, Foreign and Commonwealth Office, for records relating to service in the Indian Medical Service, which included a copy of Sinton's application dated 7th July, 1911 to join this Service; to *Mr. I. Kaye,* Librarian of the Royal Society for a reprint of the Society's obituary notice written by Sir Rickard Christophers and to *Mr. J. Dineen,* librarian of the Royal United Services Institute for Defence Studies for his guidance in finding references to the Mesopotamia Campaign.

The History of the 1st (P.W.O.) Battalion, The Dogra Regiment 1887–1947 by C. T. Atkinson printed by the Camelot Press, Southampton in 1950, and the *Medical Services General History, Volume IV,* published by H.M. Stationery Office, 1924 provided the details about the battles for the relief of Kut and the circumstances for the Victoria Cross was awarded to Sinton. From the *Frontier* 1839–1947 by Major-General J. G. Elliott, printed by Cassell, London in 1968, I obtained details about the Third Afghan War and the subsequent Waziristan Campaigns.

I am also indebted to *Field Marshal Sir Claude Auchinleck, G.C.B., G.C.I.E., C.S.I., D.S.O., O.B.E.,* for his vivid account of the Battle of El Hanna. But my greatest obligation is to *Colonel H. W. Mulligan, C.M.G., M.D., D.Sc.,* who was Sinton's oldest friend and collaborator, without whose considerable help this would not have been possible.

Finally I must acknowledge my thanks to *Brigadier Sir Ian Fraser, D.S.O., O.B.E., F.R.C.S.* and *Colonel Martin Rea, O.B.E.* for their help and assistance in making this address possible.

THE LOW INCIDENCE OF HYDATIDOSIS IN MAN IN ULSTER AND A RECORD OF A CASE

by J. S. LOGAN

The Royal Victoria Hospital, Belfast

> And Johnie has bryttled the deer sae weel,
> That he's had out her liver and lungs,
> And wi' these he has feasted his bludy hounds
> As if they had been erls' sons.
>
> *Johnie of Breadislee*

WHERE HYDATID DISEASE is endemic, it is a serious cause of ill health, disability and death. Ulster is almost free from hydatid disease. The diagnostic index of the Royal Victoria Hospital contains only two cases, one of which is recorded in this note. Two other cases have been reported by Fraser (1930) and Dales (1955). This freedom is less due to any planned precaution than to the operation of natural causes. We should try to understand these, so that we may not upset the system at present balanced in our favour, maintaining us free from hydatidosis. We should also review the nature of the risk of the disease in Ulster. There is much reason to think that the *Echinococcus granulosus* exists here in a dog-horse cycle and not in a dog-sheep cycle. Any risk to man lies in associating with dogs fed on horse flesh. Important information on hydatidosis in Eire is contained in the thesis of Hatch (1967).

An example of a large hydatid cyst is shown in Figs. 1 and 2. It occurred in a Belfast man who died at 82 of a cardiac infarction. He had kept greyhounds in the back yard. He does not seem to have had any important symptoms or disability from the cyst. The cyst wall was heavily calcified. At post mortem examination the cyst was found to contain semipurulent fluid. No embryos were identified. Rabbits, hares and rats have not been found to be infected with hydatids under natural conditions, so his hounds cannot have become infected with the adult worm by hunting these animals (if indeed it was from his greyhounds the patient acquired the infection).

The life of some tapeworms depends on a system in which one animal, being flesh-eating, preys on and eats another animal. The tapeworm larva (whether cysticercus, coenurus or hydatid) lives in the tissues, visceral or muscular, of the prey. The adult tapeworm lives in the small intestine of the host carnivore. The ova of the adult tapeworm are discharged in the carnivore host's faeces. When the ova are ingested by the prey (the larval host), the larval forms penetrate the gut wall and migrate to the viscera or muscles. There they complete larval development (e.g. to hydatid), and await the prey being caught and eaten by the carnivore. When that happens, the larval elements become adult tapeworms in the carnivore's small intestine.

The hydatid of human disease is the larval form of an echinococcus tapeworm. Each hydatid is produced from a single ovum and each tapeworm produces many ova. The best known hydatid, and in other parts of the world the most important, is that of the *Echinococcus granulosus* which occurs in a dog-sheep cycle. It has

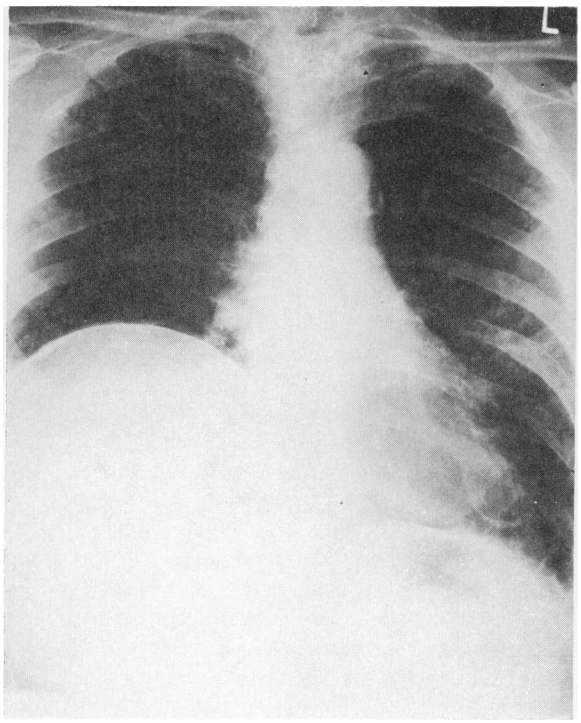

FIG. 1a. (top left). *Postero-anterior x-ray of chest, showing the large round calcified cyst in the right lobe of the liver.*

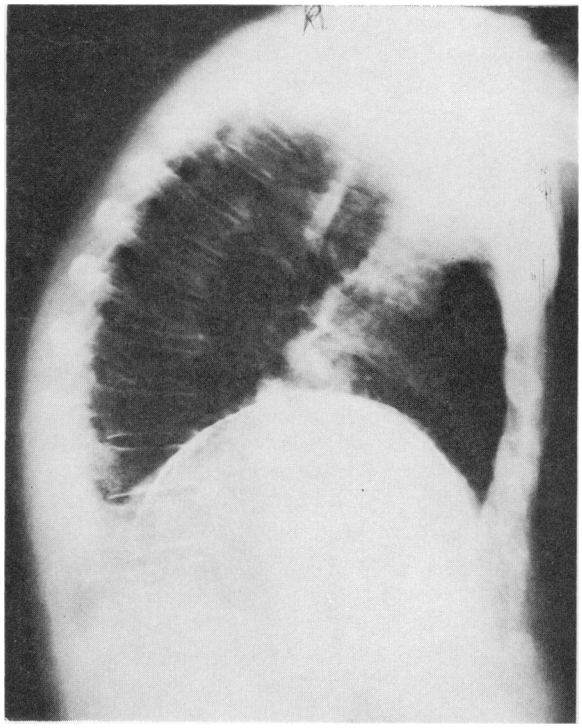

FIG. 1b. (top right). *Right lateral x-ray of chest, also showing the calcification in the cyst wall.*

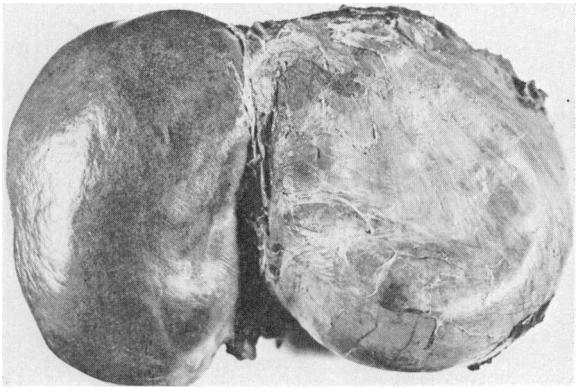

FIG. 2a. (bottom left) *The liver, and the cyst in the right lobe.*

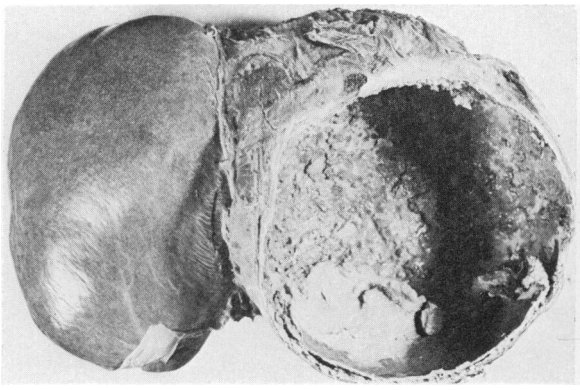

FIG. 2b. (bottom right). *The cyst opened.*

caused important epidemics of hydatidosis in man in New Zealand, Iceland and elsewhere. The adult tapeworms live in the small intestine of dogs. Many tapeworms may be found in a single dog. This hydatid is found predominantly in sheep (and to a lesser extent in cattle and swine). It is almost unknown, or possibly quite unknown, in Ulster. It does not seem at all certain that the few hydatids which do occur are those of this particular Echinococcus. Where this hydatid is found, it depends on the feeding to dogs of raw sheep offal (liver and lungs) or meat, so that the dogs consume the hydatid found in the sheep, and become infected with the adult worm. Hydatids are found mainly, but not exclusively, in the liver and lungs of the larval host. It was these very tissues which man, hunting or herding animals with the help of dogs, found convenient to give to his dogs, keeping the good meat for himself. This division continues today, as in the time of Johnie of Breadislee, and long before him.

The infecting dose delivered to a dog eating a hydatid may be very large, because each hydatid (unlike a cysticercus) contains scores, perhaps hundreds, of embryos, each of which could develop into an adult tapeworm. Where the dogs are closely associated with humans, the ova from the dog's faeces, by contamination of hands or food, are ingested by man, and hydatid cysts form in the human. There is a striking disproportion between the tiny adult tapeworm in the dog, only 3 to 6 millimetres long and not easily seen with the naked eye, and the hydatid cyst in man, which may measure several inches across. Because the adult *Echinococcus granulosus* is so small, neither the whole tapeworm nor its segments are noticed in the dog's faeces when they are discharged. The owner therefore has no means of knowing whether his dog is infected or not.

For the hydatid to occur in man blocks the cycle. Since the last wolf in Ulster was killed in the 18th century (Thompson 1856), man has not been eaten by a canine. In the 17th century it was common enough, especially in the case of homeless children (Hill 1869). However, since the Bronze and Iron Ages equipped man with swords and knives, the number of humans being killed by wolves must have fallen off enormously.

The dog-sheep cycle, so important elsewhere, has not been established in Ulster. McLean (1958) never saw a hydatid in sheep at the Belfast abattoir. Hatch (1968) had not seen an example in sheep in Eire. Gracey (1971) has "very rarely" seen hydatids in sheep in Belfast, and (1960) in a survey of livestock diseases in Northern Ireland (cattle, sheep and pigs) found no case of hydatid disease. On the other hand, the evidence for the existence of an echinococcus tapeworm in a dog-horse cycle is strong. Hydatidosis has often been observed in horses slaughtered in Ulster. Many observations have been made, though published records are few. Baxter et al. (1956) in a single day at a horse abattoir in Ulster saw hydatidosis in 7 out of 28 horses. In the livers of three there were cysts. In the other four there were small degenerated lesions containing hooks. Forbes (1964) mentions an infection rate of 55.4 per cent of 896 horses examined in 1956 in Northern Ireland. Hydatidosis has been observed in horses in Eire (Hatch 1967, 1968). Hatch noted 22 per cent infection in 426 horses.

While hydatidosis occurs both in sheep and horses in Great Britain, in New Zealand it occurs in sheep but not in horses (Williams and Sweatman 1963). In Ireland it occurs in horses but not in sheep. This segregation in spite of horses

in New Zealand and sheep in Ireland cropping grass containing echinococcus ova is very striking. Williams and Sweatman (1963) investigating hydatidosis in Great Britain and New Zealand, concluded that *Echinococcus granulosus* could be divided into two subspecies, *E. g. granulosus* in a dog-sheep cycle, and *E. g. equinus* in a dog-horse cycle. They claimed support for this subspeciation in cross infection experiments and in some morphological differences. Using their morphological criteria Hatch (1970) identified *E. g. equinus* in Irish dogs which had been fed on raw horse liver and lungs.

If we follow the subspeciation of Williams and Sweatman, it seems that hydatidosis exists at present in Ulster in the dog-horse cycle of *E. g. equinus*. *E. g. granulosus* does not seem to exist, or is very rare, though there is no reason why it could not be introduced at any time. Presumably the horses ingest the ova when cropping grass contaminated by dog faeces, and get hydatidosis. Dogs become infected with the adult worm by eating horse offal and meat containing the hydatid. Whether man ever gets *E. g. equinus* hydatidosis by associating with these dogs is unknown. Probably it should be assumed for public health purposes till shown otherwise, but it is not established.

The incidence of hydatidosis in horses can only be determined where a considerable number of horses are being slaughtered, and where the horse meat and offal are subject to veterinary inspection. It is common for the horse meat to be used for human consumption and for the offal, mainly liver and lungs, to be made into pet food. In 1970 1,226 horses were slaughtered at the Saintfield abattoir for these purposes (McKinney, 1970). The meat for human consumption was exported to Europe.

How do dogs come to eat horse meat? Hounds are commonly fed cheaply on old horses and donkeys bought in locally and slaughtered at the kennels. Often the meat is not cooked (Hatch 1967). Horse meat and offal may be taken from abattoirs or knackers' yards to feed dogs. In 1957 raw horse flesh from knackers' yards was exposed for sale as dog food in pet shops in Belfast (Swann 1957) and this is still legal. If the meat or offal is fed imperfectly cooked, the danger of infecting the dogs is very great. Important though that would be, it would affect only a small group of dogs, and the danger (if there is a danger) would be to a comparatively small number of people associated with them. If, however, horse meat and offal were used in the production of canned dog-food (as it is) and distributed to thousands of homes for domestic dogs, then any imperfection in the cooking would endanger thousands of humans. It is necessary that, in the manufacture of pet foods, cooking of the meat and offal is very strictly supervised.

Not all cysts are capable of giving rise to adult tapeworms. If the animal is killed too soon after infection the hydatid may not be mature enough to give rise to an adult tapeworm. If the hydatid is too old, e.g. in a very old animal, it may be sterile. Cysts in cattle are usually sterile but 95 per cent of cysts in horses are fertile (Soulsby).

Though the fox is said to be a host of the adult *E. multilocularis* (the cause of alveolar hydatid disease in man) yet Ross and Fairley (1969) did not find *E. multilocularis* nor any other echinococcus in 366 Ulster red foxes which they examined post mortem. No case of hydatid disease in fox trappers has been brought to notice, though fox trappers are constantly employed in Ulster. In the

year ending 31st March, 1971, the two fox trappers in Country Antrim killed 1,651 foxes (Mulholland 1971).

It seems then that we owe our very low incidence of hydatidosis in humans to the absence or great rarity of *E. g. granulosus* in Ulster dogs and sheep, and to the restriction put on *E. g. equinus* by the diminished number of horses in the country. Agricultural horses declined from 76,000 in 1939 to 5,000 in 1964 (Ulster Year Book 1963–1965). The remaining horses have a limited association with dogs, and few will be associated with dogs fed on horse flesh except those who follow hounds. It is possible that the hydatid of *E. g. equinus* develops much less readily in man than does that of *E. g. granulosus*. Much, no doubt, is owed to the existing precautions taken to prevent domestic dogs eating any but well-cooked offal and meat. Fortunately most dogs which eat raw horse flesh are not domestic dogs, and are in contact with only a limited group of humans.

To preserve the present fortunate state of affairs, no dog infected with *E. g. granulosus* (or *equinus*) should ever be imported into Ulster. If importation cannot be prohibited, at least dogs should be dewormed before importation Special care is necessary when dogs are brought from countries with a high infection rate, such as New Zealand and Cyprus. Sheep should not be imported from areas where sheep are infected with *E. g. granulosus* hydatids. Carcases of sheep and other animals dead of disease should be burned or buried or so disposed of that dogs cannot eat them. No dogs should be admitted to butchers' shops and no scraps of meat and no bones should be made available to them there. All meat and bones for all dogs should be well cooked. All slaughtering of sheep should be done in abattoirs and none on the farm. These measures should keep the Ulster national herd of sheep (1,012,000 in 1967) free from *E. g. granulosus*. So long as the sheep remain free from hydatid disease, sheep-killing dogs will not be a risk to humans so far as hydatid disease is concerned (though they will be in respect of coenuriasis – infection with the larval stage of *T. multiceps*, another dog tapeworm).

Where horses are slaughtered for human or animal food, no dogs should be allowed access to the slaughter house area. No dogs, hound or domestic, should be given horse offal or meat uncooked. Equal security is necessary at knackers' yards and at kennels where local slaughtering is done to feed hounds. No dog should have access to pasture where horses graze unless the dog is free from *E. granulosus*. Home-produced tinned dog-food should contain only thoroughly cooked meat. Foreign-produced tinned dog-food containing meat should not be allowed to be imported, unless it is inspected at the point of manufacture.

Fox hounds and stag hounds should be surveyed from time to time, and veterinary advice taken about deworming. Dead hounds should be incinerated and not buried. If *E. g. equinus* is infective for man, kennelmen and those associated with hounds form the group most liable to hydatid disease, and their medical attendants should bear the possibility in mind.

Summary

A case of hydatid disease in Belfast is recorded.

The reasons for the present low incidence of hydatidosis in Ulster are discussed, and the measures necessary to maintain the incidence at a low rate are reviewed.

Acknowledgements

I am much indebted for information to Dr. James Taggart, medical officer of health for the City of Belfast, to Dr. J. F. Gracey, city veterinarian, and to Dr. E. I. Mulholland, deputy medical officer of health for County Antrim. Any mistakes are mine alone. I am indebted to Dr. E. M. McIlrath for the x-rays, and to Dr. D. O'Hara for the post-mortem report. The reproduction of the x-rays is by the Royal Victoria Hospital department of photography and the photograph of the specimen is by Mr. D. Mehaffey.

References

For the ballad of Johnie of Breadislee see Ballads: Scottish and English. Edinburgh. William P. Nimmo. No date. The ballad appeared earlier, with some different spellings, in Walter Scott's Ministrelsy of the Scottish Border.

Baxter, J. T., Harper, W. O. and Bell, D. (1956). *Veterinary Record*, **68**, 104.

Dales, H. C. (1955). *Ulster Medical Journal*, **24**, 58.

Forbes, L. S. (1964). *Veterinary Record*, **76**, 597.

Fraser, I. (1930). *British Journal of Surgery*, **18**, 338.

Gracey, J. F. (1960). *Survey of Livestock Diseases in Northern Ireland.* Belfast. H.M.S.O.
(1971). Personal communication.

Hatch, C. (1967). *Aspects of hydatid infestation in the horse in Ireland.* Ph.D. Thesis. University of Dublin.
(1968). *Journal of the Irish Medical Association*, **61**, 334.
(1970). *Veterinary Record*, **86**, 632.

Hill, G. (1869). *The Montgomery Manuscripts.* Archer & Sons. Belfast. Pages 117–118.

Mulholland, E. I. (1971). *Personal communication.*

McKinney, J. B. (1970). *23rd Annual report of the medical officer of health for County Down.*

McLean, A. (1958). Quoted by Taylor, E. L. (1958). *Royal Society of Health Journal*, **78**, 664.

Ross, J. G. and Fairley, J. S. (1969). *Journal of Zoology.* 157, 375.

Soulsby, E. J. L. (1965). *Textbook of veterinary clinical parasitology.* Volume 1. London. Blackwell Scientific Publications.

Swann W. G. (1957). *Annual report of the medical officer of health for the City of Belfast.*

Thompson, W. (1856). *The Natural History of Ireland.* Volume 4. Henry Bohn. London.

Williams, R. J. and Sweatman, G. K. (1963). *Parasitology* **53**, 391.

CHRONIC OBSTRUCTION OF THE ANTRUM OF THE STOMACH BY A MUCOSAL DIAPHRAGM, WITH MALNUTRITION, IMPAIRMENT OF GROWTH AND SECONDARY SMALL INTESTINE DAMAGE

by **J. W. S. IRWIN, J. S. LOGAN and D. C. PORTER,**

Royal Victoria Hospital, Belfast

SOMETIMES the antrum of the stomach is almost occluded by a thin mucosal membrane or diaphragm stretched across the lumen. A central aperture, often very small, allows slow imperfect emptying of the upper loculus (which comprises most of the stomach) into the distal antrum, and into the duodenum. If nutrition is maintained at all, the level at which it is maintained depends on the size of the central aperture. There is no ulceration and no other abnormality, and as a rule no cause for the presence of the membrane is evident. The lesion is not related to the concentric contraction and canalising of the antrum seen in chronic simple ulceration of the antrum, nor is it related to cryptogenic hypertrophy of the antral muscle. It is not a pre-malignant lesion. It has to be distinguished from mucosal diaphragm at or in the pyloric (gastroduodenal) channel (Rhind 1959). That also produces chronic obstruction, but it shows a different appearance on barium X-ray plates.

Ewald (1892) described a lesion in the neighbourhood of the "pylorus" as a possible cause of dilatation of the stomach. "Sometimes a regular ring is found, so that when the stomach is opened it looks as if a cord had been drawn underneath the mucous membrane". Riegel (1897) described a "mucosal duplication" as a cause of "pyloric" stenosis and ectasia of the stomach. Probably these were antral mucosal diaphragms. More recently antral mucosal diaphragm has often been reported (Sames, 1949; Parrish *et al.*, 1966; Banks *et al.*, 1967; Parrish *et al.*, 1968) and discussed (Smith and Tuttle, 1969), but needs to be better known.

Case Report

The patient was a girl, born in 1948, who first complained at the age of 12, and first attended a hospital at age 16. She complained at that time of a tight feeling in the abdomen, of eructations of offensive gas, and of mild diarrhoea. Nothing remarkable was found on physical examination. She was not acutely or severely ill. Her weight was 94 pounds. E.S.R. 3 mm. in one hour. Haemoglobin was 80 per cent. Mean cell haemoglobin concentration 31 per cent. A barium meal showed an abnormality in the distal antrum (Fig. 1), enlargement of the stomach proximal to the antral lesion (Fig. 2), and a residue of barium at 4 hours. The X-ray appearances were those of antral mucosal diaphragm.

At age 17 she came to the Royal Victoria Hospital complaining mainly of skin bruising, but also of tightness in the abdomen, swelling of the abdomen, regurgitation of offensive gas, and of diarrhoea. She was small and anaemic. Her weight was 88 pounds. Height was 59.5 inches. Haemoglobin 75 per cent. Red cell count

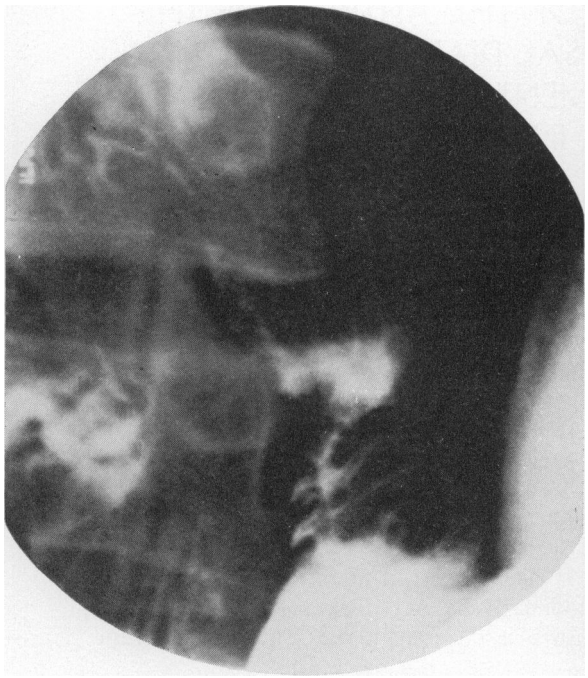

FIG. 1. *The antral diaphragm in* 1964. *There is a thin, narrow, regular, transverse filling defect in the antrum. There is a coating of barium on the distal face of the membrane, and incomplete filling of the base of the duodenal cap.*

FIG. 2. 1964. *The large stomach proximal to the antral lesion. Normal duodenal cap.*

3.8 millions. Mean cell volume 96 cubic microns. Mean cell haemoglobin concentration 30 per cent. Serum iron 34 micrograms per cent. Blood pressure 110/70. A gruel fractional test meal showed almost no free acid. Serum B_{12} 385 micromicrograms per ml. Serum folic acid 5.1 millimicrograms per ml. A barium meal X-ray showed appearances similar to those of 1964. There was some dilatation of the ileal loops of the small intestine (Fig. 3). Because the lesion was unfamiliar and her symptoms were not acute, laparotomy was deferred. The anaemia made some improvement for a short time after the administration of iron.

She was re-admitted at age 20. She was not eating well. Nutrition and growth were poor. The anaemia was worse. The haemoglobin was 7.5 grams per cent and the mean cell haemoglobin concentration 31 per cent. She had begun to take aspirin because she thought that it diminished the offensive eructations. The bowels were moving five or six times a day. Blood urea 19 mgm. per cent. The faecal fat was not increased. Blood group A, Rh positive. The antral lesion was as before (Fig. 4) and there was a small lesser curvature simple ulcer crater (Fig. 5) which was presumed to be due to aspirin damage.

At operation the stomach was found to be large and the muscle hypertrophied. The duodenum and small intestine appeared normal. When the stomach was

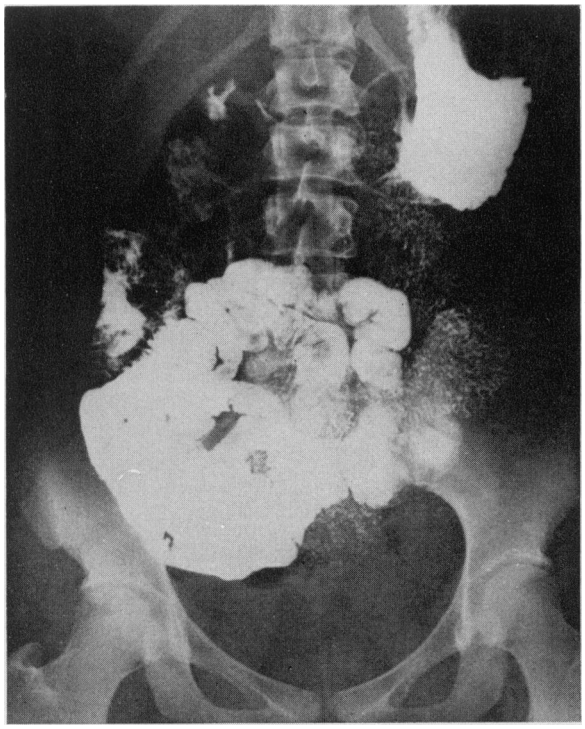

FIG. 3. 1967. *The dilated ileal loops. Normal jejunal pattern.*

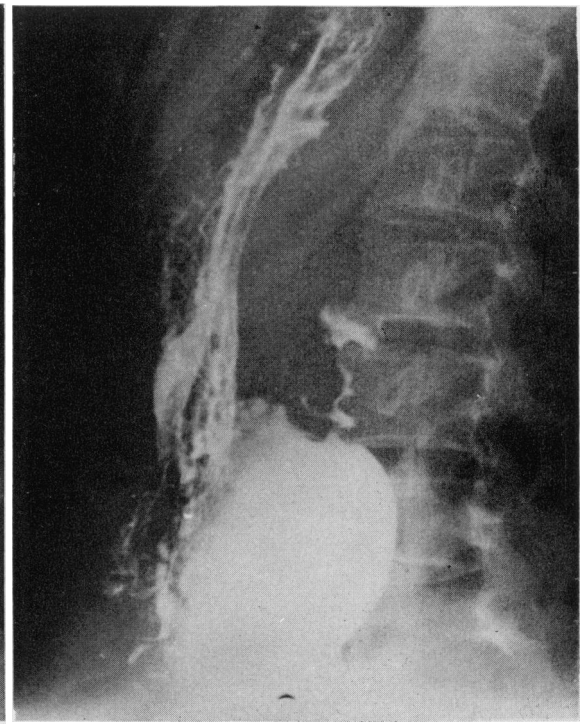

FIG. 4. 1969. *Prone view, showing the antral lesion unchanged since* 1964.

opened in its long axis, there could be seen in the antrum about 2 centimetres from the duodenum, a mucosal diaphragm with a very small opening (Fig. 6). The diaphragm was removed and pyloroplasty done.

A year later there was no longer any regurgitation of gas, nor any feeling of distension, nor any diarrhoea. She was no longer anaemic. She felt well, was working, and was shortly to be married. However, she was still not a good eater. Her weight which had risen to 96 pounds had fallen again to 88 pounds. The haemoglobin was 13.1 grams. Red cell count 4.5 millions. Serum B_{12} 690 micromicrograms per ml. Serum folic acid 12 millimicrograms per ml. Two years later a barium meal showed no delay in gastric emptying, and the appearance of the ileal loops was normal. An aortic diastolic murmur could now be heard. There were no cardiac symptoms or disability. The haemoglobin was 12.4 grams. Weight was 95 pounds. There was no increase in height. It was disappointing that there was not more improvement in muscle bulk, and in general strength and in subcutaneous fat. Perhaps increase in height was not to be hoped for in a girl of 20 in whom the menarche had occurred at $13\frac{1}{2}$.

COMMENT

The obstructing web-like diaphragm must have been present from her early

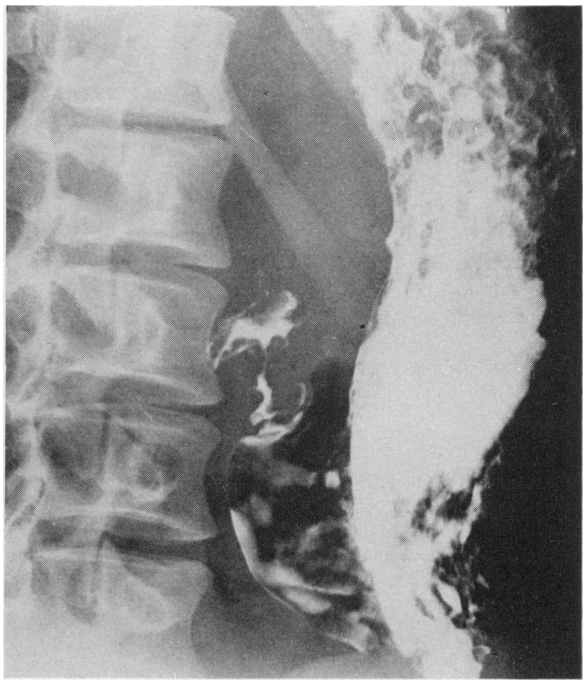

FIG. 5. 1969. *The antral lesion is shown, and a small lesser curvature simple ulcer crater.*

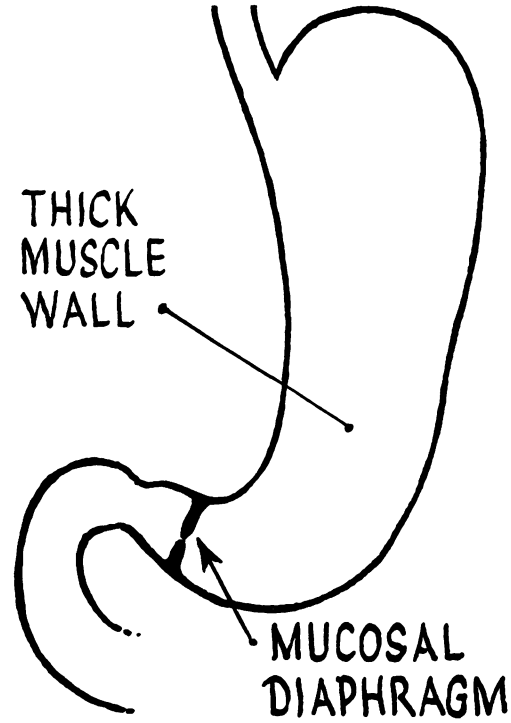

FIG. 6. 1969. *A diagram of the operative finding.*

years, and have caused her to be a poor eater, to have malnutrition, and to grow poorly. It does not seem that the poor eating, the impaired growth and frail physique are going to be corrected, in spite of the removal of the obstruction.

Diarrhoea is common in chronic incomplete gastric retention of any kind. It may indeed temporarily be worse just after the obstruction is relieved by operation. It is generally ascribed to small intestine mucosal damage by the abnormal population of bacteria growing in the residue in the obstructed stomach, or by their products. That may be an incomplete explanation. Possibly some of the small intestine mucosal damage is malnutritional (Logan, 1971).

Maturation in this patient was not hindered so much as growth, because menstruation began at 13½ and was regular. After the operation the menstrual loss was heavier than before. It was interesting that the patient did not have any personality changes resembling those of anorexia nervosa. Indeed she was a happy, sensible young person.

A barium examination of the alimentary tract is essential in investigating chronic anorexia or failure to thrive in young women. The thin, narrow, regular, transverse filling defect in the antrum, with the well-filled stomach proximally, and the slow incomplete filling distally, is diagnostic of antral mucosal diaphragm. The lesion itself is static and not progressive, though the stomach proximally may

distend, and, if there is secondary change in the small intestine, the small intestine pattern may become disordered.

The advantage of opening the antrum and inspecting the lesion is that blind antrectomy for a lesion of unidentified nature is avoided, and the least procedure necessary for correction of the obstruction can be decided.

When a considerable retention is present in the stomach at 4 or 6 hours, it is dangerous to ascribe it to "spasm" in the distal stomach or to "gastric ileus". It must be very doubtful, to say the least, if "pylorospasm" exists. Every such suggestion should be examined critically, for fear that a true obstructive lesion may be present. Though the lesions are not the same as antral mucosal diaphragm, it is worth mentioning that a minute fibrotic contracture or a small mucosal web in the pyloric (gastroduodenal) channel are the hardest to detect (Rhind, 1959). When the stomach is normal (including the antrum), and the duodenal cap is normal, and there is gastric retention, the presence of a web or a scar in the gastro-duodenal channel between the two should be considered.

Being an obstructing mucosal web, antral mucosal diaphragm resembles Plummer-Vinson stricture of the cervical oesophagus, hour-glass stricture of the stomach, and duodenal web (Logan, 1966). Web-like strictures are occasionally seen in the rectum in ulcerative colitis. In the present state of knowledge no cause common to these lesions and antral mucosal diaphragm can be discerned, though in this case the iron deficiency and anaemia were notable.

The present confusing nomenclature makes it difficult to know what is meant in the literature by "pylorus" and "pyloric". These words should be abandoned. The antrum of the stomach is that part of the stomach between the incisura or angulus on the lesser curvature and the opening, on the gastric side, of the channel leading from the antrum to the first part of the duodenum. This channel should be called the gastro-duodenal channel. We should not speak of antral lesions being "prepyloric" or juxtapyloric", but say they are in the distal antrum. We may also describe lesions as being in the proximal or mid antrum. Instead of saying "pyloric" obstruction, we should specify antral, or duodenal, or gastro-duodenal channel obstruction.

Summary

Chronic obstruction of the gastric antrum by a mucosal diaphragm is described. It caused malnutrition and impairment of growth through the patient's second decade. Secondary small intestine damage was an important feature. The X-ray appearances are diagnostic and should allow early diagnosis. If operation is delayed, spurt in growth and adequate improvement in nutrition may not be obtained, even if total correction of the obstruction is achieved.

Acknowledgements

We are indebted to Mr. George Smith, artist at the Royal Victoria Hospital, for the diagram, and to the Royal Victoria Hospial department of photography for the reproduction of the X-rays.

References

Banks, P. A., Waye, J. D., Waitman, A. M., Carnell, A. (1967). *Gastroenterology*, **52**, 1003.

Ewald, C. A. (1892. *Lectures on diseases of the digestive organs.* London. The New Sydenham Society. Page 332.

Logan J. S. (1966). *Ulster Medical Journal*, **35**, 50.

LOGAN, J. S. (1971). *Ulster Medical Journal*, **40**, 151.
PARRISH, R. A., SHERMAN, H. S., MORETZ, W. H. (1966). *Surgery*, **59**, 681.
PARRISH, R. A., KAVANAGE, C. B., WELLS, J. A., MORETZ, W. H. (1968). *Surgery, Gynecology and Obstetrics*, **127**, 999.
RHIND, J. A. (1959). *British Journal of Surgery*, **46**, 534.
RIEGEL, F. (1897). *Die Erkrankungen des Magens.* Vienna. Alfred Hoelder. Page 449.
SAMES, C. P. (1949). *British Journal of Surgery*, **37**, 244.
SMITH, V. M., TUTTLE, K. W. (1969). *Gastroenterology*, **56**, 331.

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THE PATHOGENESIS OF LARGE BOWEL DIVERTICULA

by

T. G. PARKS, M.Ch., F.R.C.S.

Senior Lecturer in Surgical Science, Department of Surgery,
Queen's University, Belfast

DIVERTICULA of the alimentary tract may be congenital or acquired. The congenital variety is composed of all coats of the intestinal wall and is said to be a "true" diverticulum. The acquired variety may be either "true" or "false" depending on whether or not protrusion of the muscle coats of the intestinal wall occurs with the mucous membrane. Although the majority of acquired diverticula are "false", an investment from all coats is probably very frequent in the earliest stages of formation (Telling and Gruner, 1917). It is generally agreed that colonic diverticula are of the acquired variety but in the caecum an isolated diverticulum of the congenital type may occur.

The term "diverticulosis" was proposed independently by Case (1914) and de Quervain (1914) to describe the presence of uncomplicated non-inflamed colonic diverticula. The terms "diverticulitis" and "peridiverticulitis" have been used to describe inflammation in and around diverticula. These designations are not entirely satisfactory as the distinction between diverticulosis and diverticulitis is not always clear. Clinical and radiological findings may not coincide and the pathological diagnosis may differ from the clinical and radiological impression (Parks, Connell, Gough and Cole, 1970). In the past it was generally assumed that diverticulosis was a painless and usually symptomless condition. It is now known that troublesome symptoms, including pain, may occur in the absence of inflammation. For these reasons the term "diverticular disease" of the colon which encompasses the complicated as well as the uncomplicated state has been preferred by many workers (Morson, 1963; Williams, 1963; Fleischner, Ming and Henken, 1964; Almy 1965).

Incidence, Age and Sex Distribution

The incidence of diverticular disease of the colon in the general population is difficult to assess and figures derived from clinical practice do not necessarily give a true picture, for they do not include those subjects who have no complaints and many of those with mild symptoms who do not require hospital care. Most of the estimations of the frequency of the condition have been based either on necropsy reports or data derived from barium enema examinations. The former method often yields a spuriously low figure, since diverticula tend to be elusive unless a meticulous search is made for them. The latter method tends to give a spuriously high estimate, since barium enemata are usually only carried out on

patients with abdominal symptoms and it is to be expected that in this selected group, the incidence would be higher than in the general population.

In earlier autopsy studies the incidence quoted was usually between 3 and 10 per cent (Drummond, 1917; Mailer, 1928; Rankin and Brown, 1930; Ochsner and Bargen, 1935; Morton, 1946). In these series the investigations were of a retrospective nature and it is probable that they underestimated the true incidence at that time. In most of these studies, data were extracted from autopsy records and there is no indication that the authors personally examined the colons of the cadavers.

The Incidence of Diverticular Disease in Northern Ireland

If a worthwhile appraisal of the prevalence of this disease is to be made from post-mortem material, it is essential that a careful and specific prospective investigation is made. A detailed study was carried out by the author on 300 consecutive colons obtained from the Pathology Department, Royal Victoria Hospital, Belfast (Parks, 1968). In order that an adequate examination could be made, each colon was opened from end to end, since minor or even moderate degrees of disease in obese subjects may be undetected, if only the serosal aspect of the bowel is inspected.

The incidence of diverticular disease in this survey is shown for both sexes in Table 1. The colons of 171 males with an average age of 61.3 years at the time of death were examined and colonic diverticula were present in 57, or 33 per cent of the cases. The youngest male noted to have diverticular disease was 44 years, the eldest 86, and the average age of the diseased group was 65.8 years. Of 129 females with an average age at the time of death of 63 years, there were 54 or 41.9 per cent with colonic diverticula. The youngest female with the disease was only 29, the eldest 87 and the average age of those affected was 66.7 years.

TABLE I

Incidence and Sex Distribution of Diverticular Disease of the Colon in 300 Consecutive Autopsies

	Male	*Female*	*Total*
Number of colons examined	171	129	300
Number of colons with diverticular disease	57	54	111
Affected by diverticular disease	33.3%	41.9%	37%

The frequency of the disorder increased progressively with age, so that in the 6th and 7th decades more than one-third of cases were affected and by the 9th decade one-half of the cases were involved (Fig. 1.).

Other Prospective Autopsy Series

There has been a number of specific investigations in different countries which have attempted to estimate accurately the frequency of the disease. Some of these

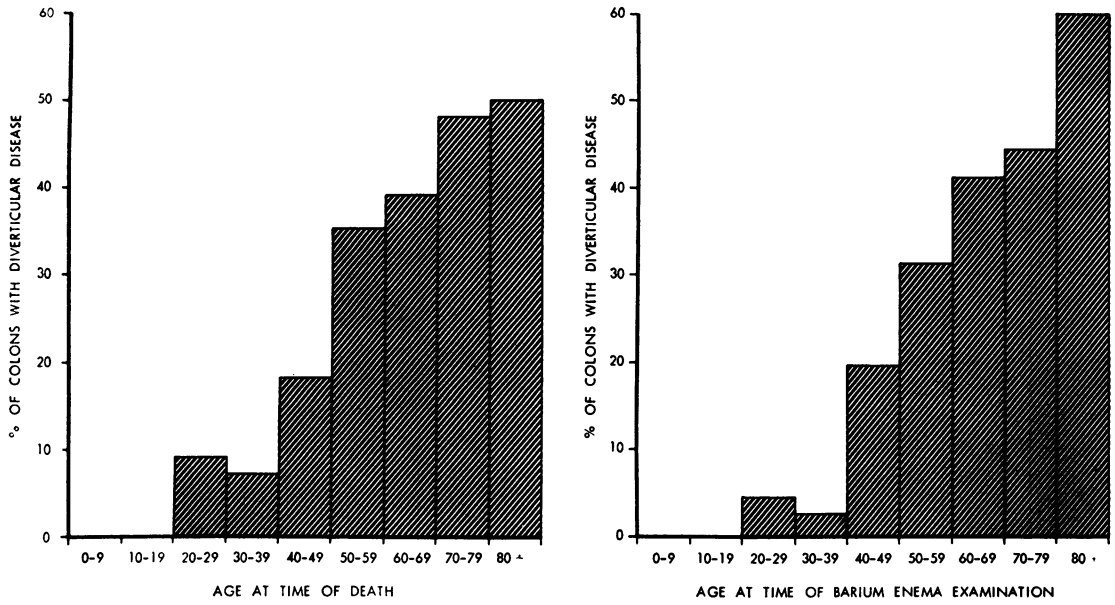

FIG. 1. *Showing the increasing incidence of diverticular disease of the colon with age.*
(*a*) *in* 300 *consecutive autopsies* (*b*) *in* 500 *consecutive barium enemas*

are shown in Table 2. In most of these series the authors personally undertook a meticulous examination of each colon and it is likely that the most accurate figures of the frequency of the condition to-day come from this data.

TABLE II

Specific Prospective Studies of the Incidence of Diverticular Disease of the Colon in Autopsy Material

Author	*Country*	*Number of Autopsy colons examined*	*Percentage of colons with Diverticular Disease*	*Remarks*
Mourgues (1913)	France	100	30%	Consecutive autopsies on aged subjects
Bumm (1933)	Germany	920	33%	Necropsies on subjects over 50 years of age
Bevan (1961)	England	116	12%	Consecutive autopsies on subjects over 40 years of age
Watt and Marcus (1962)	England	76	55%	Consecutive autopsies
Slack (1962)	England	141	18%	Consecutive autopsies
Parks (1968)	N. Ireland	300	37%	Consecutive autopsies
Hughes (1969	Australia	200	45%	Two series of consecutive autopsies

Hughes (1969) reported a remarkably high figure of 45 per cent among 200 unselected autopsies. The incidence of diverticular disease was 36 per cent among cases in the 6th and 7th decades and 56 per cent among those who were over the age of 80 at the time of death.

Radiological Series in Northern Ireland

An assessment was made of the findings on 500 consecutive barium enema examinations performed at the Royal Victoria Hospital, Belfast, during a six month period. Colonic diverticula were demonstrated in 55 (28.9 per cent) of 190 men and in 96 (31 per cent) of 310 women (Table 3). Although the ages of patients ranged from eleven years upwards, the youngest male with colonic diverticula was aged 40 and the youngest female was 29 years. Fig. 1 shows that the incidence of the disease increased with age and the condition was demonstrable in about half of the patients over 70 years of age. It should be remembered that in this series most of the patients had abdominal symptoms, so that the circumstances are weighed in favour of revealing pathology of one kind or another.

The average age of the 500 patients undergoing barium enema examinations was 51.6 years but the average age of patients affected by diverticular disease was 63.7 years.

TABLE III

Incidence and Sex Distribution of Diverticular Disease of the Colon in 500 Consecutive Barium Enema Examinations

	Male	*Female*	*Total*
Number of barium enemas	190	310	500
Number with diverticular disease	55	96	151
% Affected	29%	31%	30.2%

Other Radiological Series

The incidence of diverticular disease in barium enema series has increased from an average figure of around 10 per cent in the 1920's to a figure in the region of 25 or 30 per cent in the last decade. Welch, Allen and Donaldson (1953) found that one-third of barium enemas at the Massachusetts General Hospital showed diverticula. These workers noted an increasing incidence in the second half of life until, at the age of 85, two-thirds of their patients were affected.

In order to ascertain the prevalence of colonic diverticula in the general population in the Oxford area, Manousos, Truelove and Lumsden (1967) studied 109 healthy volunteers by a modified barium meal and follow-through. More than one third of subjects over the age of 60 had diverticula.

Changing Sex Incidence

The early series reported a higher incidence of diverticular disease of the colon

in males (Telling and Gruner, 1917, M: F 2: 1; Spriggs and Marxer, 1927, M: F 5: 2; Fraser, 1933, M: F 3: 1). In recent surveys male preponderance has not been a feature and in the majority of reports the incidence was higher in females (Smith, 1951; Greene, 1957; Horner, 1958; Boles and Jordan, 1958; Manousos, Truelove and Lumsden, 1967; Parks, 1969a).

Geographical Distribution

Wells (1949) pointed out that in Western Africa, the native who eats a bulky diet does not develop diverticula whereas volvulus of his excessive large colon is relatively common. On the other hand, colonic diverticula are not infrequent in the negro of North America. Vague (1951) stated that diverticular disease was more common in Anglo-Saxons than in the French population and Nordic races were predisposed to diverticular formation more than the Southern races. The rarity of the disease among Italian people and those of Latin extraction is exemplified by Piccinni's (1952) report of a single case of diverticula of the sigmoid among approximately 18,000 surgical cases observed over a 12 year period at Bologna Surgical Clinic. Kohler (1963) reported an incidence of 15.8 per cent in industrialised Sweden, in contrast to an incidence of 5.1 per cent in neighbouring Finland. An extensive epidemiological study has been carried out by Painter and Burkitt (1971). They confirm a low incidence of the disease in developing areas, such as rural Africa and Asia, in contrast to the high frequency in Western civilisation and North America. Avery Jones (1969) was of the opinion that the disease was rare in China and Reilly (1969) came to the same conclusion after visiting Russia.

Diet and its Possible Relevance

In his Harveian Lecture, Sir Berkerley Moynihan (1927) stated: "A diet leaving little residue is the one generally advised but I am not sure that a diet leaving a bulky residue is not better, provided that the bowels act once per day". Almost half a century later, after millions of low residue meals, there has been a swing towards a high residue regime in the management of the disease. Cleave, Campbell and Painter (1969) have shown that the death rate for diverticular disease has increased progressively since the early 1920's except during the war and immediate post-war years when white bread and refined sugar were restricted. Wells (1949) commented on the possible beneficial effects of a bulky diet in protecting the West African against the disease.

There is some experimental evidence in support of the hypothesis that a low residue diet predisposes to diverticular formation. Carlson and Hoelzel (1949) carried out dietary experiments on rats and found that those fed on a low residue diet, developed diverticula more readily than those fed on a similar diet with hemi-cellulose added as a bulk-former. Rats initially fed on a high residue diet and subsequently changed to a low residue diet were affected most of all. On the other hand, Naunton Morgan and Ellis (1969) were unable to produce diverticula in the colons of rats maintained on a low roughage diet for up to 70 weeks. The effects of low-residue diet on the canine colonic wall has been studied

by Havia (1971). No hypertrophy in the circular or longitudinal muscle was observed and there was no alteration in intracolonic pressure measurements. Hodgson (1972) has produced a form of "diverticulosis" in rabbits by feeding them on a refined diet of white bread, butter, sugar and milk with vitamin supplements. After four months on this diet the animals had increased considerably in weight, were constipated and had contracted colons. When these colons were stimulated to contract vigorously by prostigmine injected parenterally, broad-based blue-domed bulgings were produced.

Obesity

The relationship of obesity to diverticular disease of the colon has attracted much attention since Klebs (1869) postulated that fat in the region where a blood vessel passes through the colonic muscle might weaken the wall. Mayo, Wilson and Griffen (1907) believed that obesity was a frequent concominant of weakened colonic musculature. Bland-Sutton (1903) found obesity in 77 per cent of cases of diverticula of the colon, while Babcock (1941) considered that obesity was a factor in 17 per cent.

On the other hand it must be admitted that diverticular disease of the colon can, and does, occur in lean and wasted individuals. Ochsner and Bargen (1935) concluded that patients with diverticula of the colon were no fatter than normal subjects. Their view was supported by Morton (1946) and Horner (1958).

In the Northern Ireland clinical survey, it was found that the weights of patients with diverticular disease were marginally higher than those of the general population. In the autopsy specimens examined locally it was estimated that excessive fat was associated with one-half of the diverticular colons compared with one-quarter of the non-diverticular colons. It is probable that in some cases of diverticular disease the obesity is apparent rather than real and is due to shortening of the muscle wall resulting in bunching of the fat.

Associated Pathological Lesions

Table 4 gives the frequency of some pathological conditions which occurred in 521 patients with diverticular disease surveyed clinically (Parks, 1969b). Since many patients did not have any radiological investigations of the upper gastro-intestinal tract or gall bladder, it is likely that the true incidence of associated or coincidential lesions is rather higher than that recorded.

The association of hiatus hernia, cholecystitis and colonic diverticula, known as Saint's triad, has been generally accepted. The tendency to hernia formation and diverticular formation in other regions of the body is of particular interest and raises the question of a more widespread muscular or connective tissue defect. Foster and Knutson (1958) studied patients who had had previous cholecystectomies and found that in 19 per cent of cases both hiatus herniae and colonic diverticula could be demonstrated. Horner (1958) made a specific examination for hiatus herniae in 292 patients with diverticular disease and noted a frequency of 15.3

TABLE IV

Associated or Co-incidental Pathological Lesions in 521 Cases of Diverticular Disease

	Number of Patients Affected	*% of the Total Cases*
Cholecystitis + gallstones	72	13.8%
Hiatus hernia	38	7.3%
Abdominal hernia (excluding excisional)	65	12.5%
Incisional hernia	18	3.5%
Peptic ulcer	76	14.6%
Duodenal diverticulosis	8	1.5%
Small bowel diverticulosis	9	1.7%
"Appendicitis"	76	14.6%
Carcinoma of colon	16	3.1%

per cent, which contrasted with a 3 per cent incidence of hiatus hernia in non-diverticular controls. De la Vega, Naves and Ponce de Leona (1964) considered that there was a predisposition to inguinal and femoral herniae in patients with colonic diverticula and reported an incidence of 20.5 per cent of groin herniae among 190 diverticular patients.

Colonic diverticula may be associated with diverticulosis of other viscera. Acording to Fifield (1927) this may be as high as 11 per cent. Conversely, it is claimed that patients with diverticula of the duodenum or jujeno-ileum are more liable to diverticula of the colon than controls. Lee and Finby (1958) studied 45 patients with diverticula of the jujenum and/or ileum and noted associated colonic diverticula in 25 cases, an incidence of 53 per cent. Other workers found that the frequency of large bowel involvement in cases with the small bowel disorder ranged from 30 to 50 per cent (Benson, Dixon and Waugh, 1949, Baskin and Mayo, 1952).

The association of visceral diverticulosis and Marfan's syndrome has been reported by Clunie and Mason (1962) and Miekle, Becker and Gross (1965). These workers suggested that there may be a qualitative deficiency or alteration in the supporting connective tissue of the colon in diverticular disease.

MORPHOLOGIC DERANGEMENTS

Muscular Abnormality

Several workers have drawn attention to the muscle abnormality associated with colonic diverticula (Keith, 1910, Edwards, 1939, Morson, 1963, Arfwidsson, 1964). Whether this abnormality is primary or secondary to the development of diverticula is less certain. It is present in a high proportion of autopsy colons bearing diverticula and in virtually every surgical specimen removed on account of symptomatic diverticular disease. There is accumulating evidence that the

muscular abnormality may be a primary phenomenon and precede the formation of diverticula (Morson, 1963; Arfwidsson, 1964; Williams, 1967; and Parks 1970). The early radiological features of the muscular abnormality of diverticular disease is shown in Fig. 2: no diverticula as yet demonstrable.

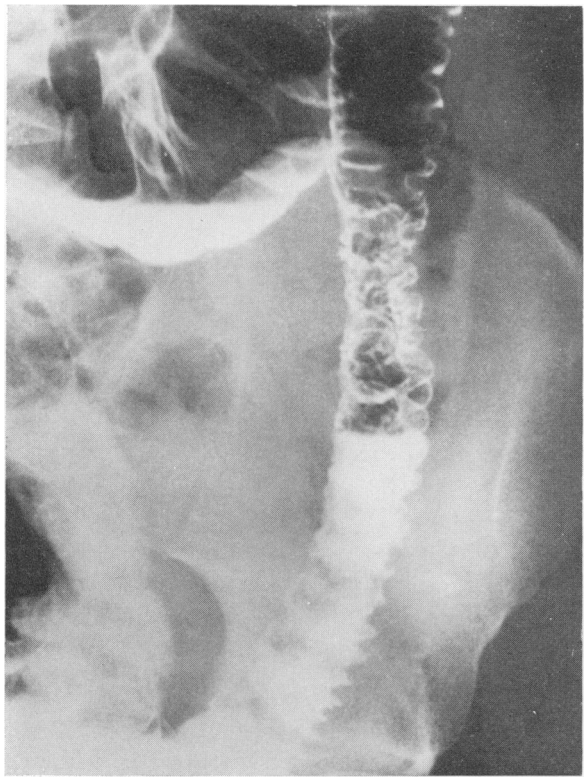

FIG. 2. *Barium enema of the sigmoid colon demonstrating the intraluminal projection of muscular folds in early diverticular disease. There are no diverticula present.*

One hundred and thirty consecutive colons were carefully examined for the muscular abnormality so frequently seen in association with colonic diverticula (Parks, 1968). Forty-five specimens were found to have diverticula and of these 14 (31 per cent) had a marked degree of muscle thickening. A further 19 (42 per cent) were judged to have a minor to moderate degree of thickening, although the distinction between normal and abnormal was not always easy to make. The thickened segments averaged 40 cm. in length. The circular coat of the sigmoid was especially involved and thick muscle bands which extend around one-half to two-thirds of the bowel circumference encroached markedly on the lumen. Heaping up of redundant mucosa, suggestive of bowel shortening, was a characteristic feature.

A similar incidence has been recorded in Australia by Hughes (1969 who found that 73 per cent of autopsy colons bearing diverticula had muscle thickening. An even higher incidence of muscle abnormality in surgically resected specimens has been reported by Morson (1963) who found that thickening was the most consistent and striking feature; the abnormality was present in all of the 173 cases treated by resection over a five year period at St. Mark's hospital.

Macroscopically and microscopically the muscle shows thickening and usually both the circular and the longitudinal coats are involved, sometimes to a marked degree. It may be that this thickening is produced by sustained contraction of the muscle bundles rather than either hypertrophy or hyperplasia of muscle cells (Morson, 1963). It has been suggested that shortening of the longitudinal muscle causes the circular muscle to be thrown in corrugations resulting in the formation

of prominent crescentic folds which project into the lumen. The mucosa is also made redundant and this further encroaches upon the lumen.

Williams (1965) considered that contraction and shortening of the colon are the predominant features in the pathogenesis of diverticular disease. Following a microscopic study Arfwidsson (1964) concluded that the increased thickness is due to hypertrophy of the muscle cells. As a result of detailed biochemical investigation of muscle cells Slack (1966) considered that the thickening is not due to hypertrophy, but he could not ascertain whether hyperplasia of the muscle cells or longitudinal contraction of the bowel wall is the more likely cause. It is thus true to say that the aetiology of the muscle thickening is still uncertain.

Distribution of Colonic Diverticula Lengthwise in the Bowel

Diverticula may occur in any or all of the segments of the colon, but there is a marked predilection for the sigmoid region. The descending colon is also commonly involved. Table 5 reveals the sites where diverticula were distributed along the large bowel in three separate studies by the author. The sigmoid was by far the commonest site affected. It was involved alone in 45 per cent to 65 per cent of the patients. In addition, the sigmoid was often also involved in combination

TABLE V

Distribution of Colonic Diverticular

Site of Colonic Diverticula	*Autopsy Series* (111)	*Clinical Survey* (461)	*Radiological Series* (151)
Sigmoid	50	302	77
Descending	2	14	4
Transverse	1	4	7
Ascending	3		1
Ascending and caecum			1
Sigmoid and descending colon	30	83	33
Sigmoid and transverse colon	4	5	5
Sigmoid and ascending colon	3	3	
Sigmoid and caecum	2		
Sigmoid, descending and transverse colon	6	19	7
Sigmoid, descending and ascending colon	1		
Sigmoid, transverse and ascending colon			2
Sigmoid, descending, transverse and caecum	2		
Sigmoid, descending, ascending colon and caecum	2		
Whole colon	5	31	14

with other regions so that 93 per cent of those with diverticular disease in the three series had this segment affected.

There has been much speculation as to the reason why diverticular disease affects the sigmoid colon more often than any other part of the bowel. Undoubtedly, the left half of the colon and particularly the sigmoid, differs both anatomically and physiologically from the right half of the colon. It has been postulated that pressure/tension relationships in the narrow segments of the colon may be a factor in the formation of the mucosal herniation. According to the law of Laplace, the tension in the wall of a hollow viscus is proportional to the radius multiplied by the pressure within the cylinder. If it is assumed that contraction of all the circular muscle fibres in the whole colon is equally strong and produces the same tension, then the intracolonic pressure would be greater in the narrow lumen of the sigmoid.

Position of Diverticula in relation to the Circumference of the Colon

The anatomy of the colon is such that concentration of the longitudinal muscle fibres into three bands or taeniae leads to relative weakness of the intervening areas. Between the taeniae, the muscle coat consists chiefly of circular fibres with a few longitudinal ones, and it is here that diverticula are apt to occur. Fig. 3 is a diagrammatic representation of the colon on cross section and demonstrates that the usual sites of herniation of the mucosa are in the lateral intertaenial areas.

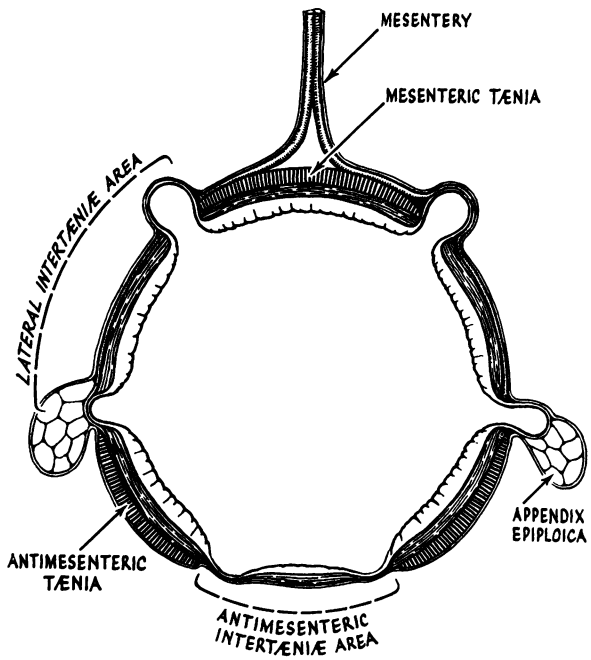

FIG. 3. *Diagrammatic representation of the relationship of diverticula and blood vessels to the taeniae coli.*

There is a tendency for diverticula to develop in two longitudinal rows on each side of the colon. Fig. 4 shows a pelvic colon which has been opened up along its mesenteric taenia. The central portion consists of the two antimesenteric taeniae with a narrow strip between them. On each side of this, the lateral intertaenial areas are shown and in each of these there are basically two rows of diverticula. The strip of colon between the two antimesenteric taeniae is narrow and diverticula in this area are rare. When they occur they are always small and globular, but again they tend to form in two rows (Fig. 5).

Klebs, in 1869, drew attention to the relationship of

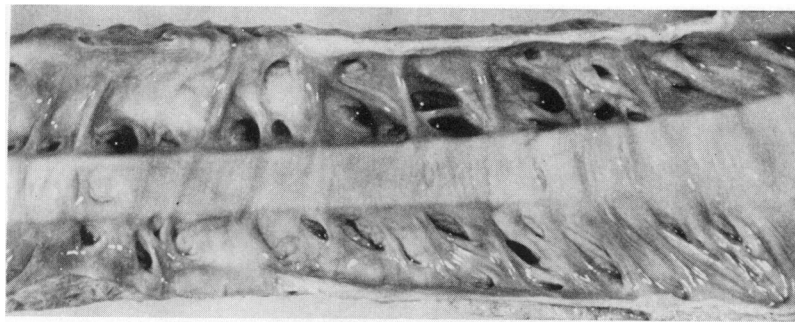

FIG. 4.

The mucosal aspect of a colon opened along its mesenteric taenia. Two rows of diverticula are seen in each lateral intraenial area.

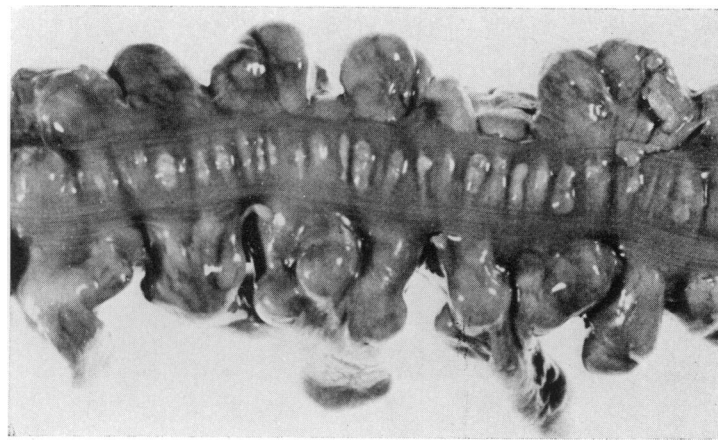

FIG. 5. *Colon showing early diverticular formation between the two antimesenteric taeniae.*

diverticula to the blood vessels of the intestinal wall and suggested that the pull on the bowel wall by the mesenteric vessels produces areas of diminished resistance. The proximity of diverticula to the site of the passage of blood vessels was also noted by early workers (Edel, 1894, Hansemann, 1896, Graser, 1899, Beer, 1904). Drummond (1917) believed that the blood vessels predispose to the formation of diverticula in much the same way as the spermatic cord predisposes to the development of an inguinal hernia. However, this is not a true analogy as there is no pre-formed sac adjacent to the blood vessels which penetrate the colonic wall.

The important role of the canal through which blood vessels pass has been re-emphasised recently (Slack, 1960, Tagliocozzo and Virno, 1961, Arfwidsson, 1964). Other workers do not subscribe to the view that the colon is less resistant at these points (Noer, 1955, Deelman, 1957, Laumonier and Martin, 1957, Fleischner, Ming and Henken, 1964). The relationship of diverticula to the blood vessels which penetrate the wall was also studied by the author following intravascular injection of dye. Sizeable vessels were frequently found adjacent to the necks of the diverticula (Fig. 6). The common symptom of bleeding is readily explained by the proximity of significant sized blood vessels but whether their presence is related to the aetiology of the diverticular disease is still debated.

FIG. 6.
Showing a blood vessel penetrating the colonic wall close to a diverticulum.

DISTURBANCES OF COLONIC MUSCLE FUNCTION

Theoretically diverticula of the colon might develop (a) if the intraluminal pressure is raised but there is no weakness of the colonic wall or (b) if the intraluminal pressure is normal but weakness of the colonic wall exists.

There is no evidence that colonic diverticula are more frequent in conditions such as Hirschsprung's disease or benign stricture of the lower bowel in which raised intracolonic pressure may be present for a long time. The importance of muscular contraction rather than passive distension as a cause of mucosal herniation was stressed by Stout (1923). He stimulated the resected appendix of the dog, having cut gaps in the muscular wall, and was able to produce protrusion of the mucosa through the defects. Wilson (1950) in similar experiments on human appendices, found that diverticula only appeared as a result of muscular contraction. If the results of these studies can be applied to the colon, the importance of muscular activity is apparent.

Intraluminal Pressures

There is now a considerable amount of evidence that abnormalities of physiological function accompany the morphologic derangements which are an integral part of diverticular disease. The advent of optical manometers and electro-manometers has led to more accurate and meaningful measurements of intraluminal

pressures in the large intestine. Using small bore open-ended water-filled polythene tubes or very fine air filled tubes with miniature balloons attached at their tips, resting intracolonic pressures and the responses to physiological and pharmacological stimuli are readily measured.

While reports differ as to whether or not there is an increase in intraluminal pressure under resting conditions (Painter and Truelove, 1964, Arfwidsson, 1964, Parks and Connell, 1969, Attisha and Smith, 1970), there is a general agreement that the colon responds excessively to certain pharmacological stimuli such as morphine and prostigmine. As pharmacological stimuli are uncommon in real life, it is important to consider the possibility of recurring elevation of intraluminal pressure in response to physiological stimuli. There is some support from motility studies for an exaggerated response to the ingestion of food (Arfwidsson, 1964; Parks and Connell, 1969; Attisha and Smith, 1969).

Following experiments using simultaneous pressure manometry and cine-radiography, Painter *et al* (1965) postulated that contractions of the interhaustral rings, which can effectively occlude the lumen, result in the formation of multiple short isolated segments of the colon. It is evident that in a colon with prominent crescentic folds of circular muscle and redundant mucosa, it is relatively easy for segmentation to occur. Contraction of the wall of a closed segment may lead to a considerable rise in intraluminal pressure.

Reilly (1964) introduced the operation of colomyotomy in which the circular muscle fibres of the colon are divided by a longitudinal incision along one of the antimesenteric taenia – a procedure corresponding to Heller's operation at the cardia or Rammstedt's operation on the pyloric canal. Attisha and Smith (1969) measured the intraluminal pressures before and after sigmoid myotomy in man. Pre-operatively the resting pressures were not elevated, but there was an excessive response to prostigmine. This was significantly reduced by myotomy but the effect was of a temporary nature and returned to the pre-operative values within two or three years (Smith – personal communication).

Recently Balfour, Giannakos and Smith (1972) measured the intracolonic pressures manometrically in rabbits before and after colomyotomy. For a time following myotomy the colon was less responsive to prostigmine stimulation than pre-operatively, but there was a complete return to pre-operative values within four months of operation. These workers concluded that the effects of myotomy in the rabbit, and by analogy in man, are of a temporary nature. From the limited number of studies in man and animals it would appear that there is little experimental support for the operation of sigmoid myotomy.

Hodgson (1972) has used adult rabbits in an attempt to reproduce an animal model for the study of diverticular disease. After preliminary intracolonic pressure measurements the rabbits were given a refined low-residue diet for four months. Repeat pressure measurements at this stage revealed an increased basal motility and a markedly exaggerated response to prostigmine which contrasted with the pre-diet values.

Compliance of Colon Wall

In addition to the question of raised intracolonic pressure the other major factor to be considered is the possibility of weakness of the colonic wall which

might yield to normal intraluminal pressures. In order to elucidate this point, Parks and Connell (1969) measured the resistance of the colonic wall to distension. By incremental distension of a balloon in the lumen of the sigmoid, the ability of the muscle to resist an opposing force was assessed. It was shown that in spite of its thickness, the colonic muscle was deficient, in terms of its capability to resist pressure. It may be that the pathogenesis of diverticular formation should not be explained simply on the basis of raised intraluminal pressure alone but cognizance should also be taken of another phenomenon, i.e. weakness or loss of compliance of the wall which tends to increase with advancing age.

Possible Relationship to Irritable Bowel Syndrome

In view of the fact that some features of diverticular disease are similar to those of irritable bowel syndrome, interest has been aroused concerning the possibility of a common underlying aetiological factor. Lumsden, Chaudhary and Truelove (1963) stated that the radiological appearance of the sigmoid in irritable colon syndrome closely resembles the findings in early diverticular disease. Fleischner *et al* (1964) believed that a relationship exists and contended that contractions of the irritable colon leads to heaping up of muscle folds with narrowing of the lumen, which may facilitate the development of diverticula. It is true that there are some similarities in the motility responses to parasympatheticomimetic stimuli in the two conditions but important differences do exist (Parks and Connell) 1972. Observations during the clinical survey of diverticular disease in Northern Ireland did not suggest that irritable colon was a precursor of diverticular formation (Parks, 1969a). The latter finding was in agreement with Edwards (1965) who failed to find any casual relationship on follow-up of patients with irritable bowel.

Conclusions

A number of factors which may be relevant to the formation of colonic diverticula have been discussed. Much new information has come to light on the pathogenesis of the disease and further approaches are currently being made. However, it is evident that the aetiology of diverticular disease is still not fully understood.

References

Almy, T. P. (1965). *Gastroenterology*, **49**, 109.
Arfwidsson, S. (1964). *Acta chir. scand.* **Suppl. 342.**
Attisha, R. P., and Smith, A. N. (1969). *Brit. J. Surg.*, **56**, 891.
Avery, Jones, F. (1969). *Recent Advances in Surgery* ed. S. Taylor. London, Churchill.
Babcock, W. W. (1941). *Rev. Gastroent.* **8**, 77.
Balfour, G., Giannakos, V., and Smith, A. N. (1972). *In preparation.*
Baskin, R. H. Jr., and Mayo, C. W. (1952). *Surg. Clin. N. Amer.*, **32**, 1185.
Beer, E. (1904). *Amer. J. med. Sci.*, **128**, 135.
Benson, R. E., Dixon, C. F., and Waugh, J. M. (1943). *Ann. Surg.*, **118**, 337.
Bevan, P. G. (1961). *Brit. med. J.*, **1**, 400.
Bland-Sutton, J. (1903). *Lancet*, **2**, 1148.
Boles, R. S. Jr., and Jordon, S. M. (1958). *Gastroenterology*, **35**, 579.
Bumm, R. (1963). *Langenbecks Arch. klin. Chir.* **174**, 14.
Carlson, A. J., and Hoelzel, F. (1949). *Gastroenterology*, **12**, 108.
Case J. T. (1914). *Arch. Roentg. Ray.*, **19**, 375.

CLEAVE, T. L., CAMPBELL, G. D., and PAINTER, N. S. (1969). *Diabetes, Coronary Thrombosis, and the Saccharine Disease.* 2nd. ed. Bristol, Wright.
CLUNIE, G., and MASON, J. (1962). *Brit. J. Surg*, **50**, 51.
DEELMAN, H. (1957). *Arch. Anat. path.*, **33**, 161.
DE LA VEGA, J. M., NAVES, J., and PONCE DE LEONA, A. L. (1964). *In Gastroenterology*, Bochus, H. L. (Ed.). vol 2. 2nd ed. Philadelphia, Saunders.
DE QUERVAIN, F. (1914). *Dtsch. Z. chir*, **128**, 67.
DRUMMOND, H. (1917). *Brit. J. Surg.*, **4**, 407.
EDEL, M. (1894). *Virchows Arch. path. anat.*, **138**, 347.
EDWARDS, D. A. W. (1965). *Ann. roy. coll. Surg. Engl.*, **37**, 275.
EDWARDS, H. C. (1939). *Diverticula and Diverticulitis of the Intestine.* Bristol, Wright.
FIFIELD, L. R. (1927). *Lancet*, **1**, 277.
FLEISCHNER, F. G., MING, S., and HENKEN, E. M. (1964). *Radiology*, **83**, 859.
FOSTER, J. J. and KNUTSON, D. L. (1958). *J. Amer. med. Ass.*, **168**, 257
FRASER, I. (1933). *Causation, Pathology and Treatment of Diverticula of the Large and Small Intestine.* M.D. Thesis, Belfast
GRASER, E. (1899). *Munch. Med. Wschr.* **46**, 721.
GREENE, W. W. (1957). *Amer. J. Surg.* **94**, 282.
HANSEMANN, D. V. (1896). *Virchows Arch. path. anat.*, **144**, 400.
HAVIA, T. (1971). *Acta chir. Scand.* **Suppl. 415.**
HODGSON, J. (1972). *In preparation.*
HORNER, J. L. (1958). *Amer. J. dig. Dis., N.S.*, **3**, 343.
HUGHES, L. E. (1969). *Gut*, **10**, 336.
KEITH, A. (1910). *Brit. med. J.* **1**, 376.
KLEBS, E. (1869). *Handbuch der Pathologischen Anatomie, Bd.*, **1**, 271, Berlin, Hirschwald.
KOHLER, R. (1963). *Acta chir. Scand.*, **126**, 148.
LAUMONIER, R., and MARTIN, E. (1957). *Arch. Path.*, **33**, 403.
LEE, R. E., and FINBY N. (1958). *A.M.A. Arch. Intern. Med.* **102**, 97.
LUMSDEN, K., CHAUDHARY, N. A., and TRUELOVE, S. C. (1965). *Clin. Radiol.* **14**, 54.
MAILER, R. (1928). *Lancet*, **2**, 51.
MANOUSOS, O. N., TRUELOVE, S. C., and LUMSDEN, K. (1967). *Brit. med. J.*, **3**, 762.
MAYO, W. J., WILSON, L. B., and GRIFFEN, H. Z. (1907). *Surg. gynaec. Obstet.*, **5**, 8.
MIELKE, J. E., BECKER, K. L., and GROSS, J. B. (1965). *Gastroenterology* **48**, 379.
MORSON, B. C. (1963). *Brit. J. Radiol.* **36**, 385.
MORTON, J. J. Jr. (1946). *Ann. Surg.*, **124**, 725.
MOURGUES, P. de (1913). *Des Diverticules acquis du gros intestin.* Thesis, Lyons.
MOYNIHAN, B. G. A. (1927). *Lancet*, **1**, 1061.
NAUNTON MORGAN, M., and ELLIS, H. (1969). *Brit. med. J.*, **2**, 53.
NOER, R. J. (1955). *Ann. Surg.*, **141**, 674.
OCHSNER, H. C., and BARGEN, J. A. (1935). *Ann. intern. Med.*, **9**, 282.
PAINTER, N. S., and BURKITT, D. P. (1971). *Brit. med. J.*, **2**, 450.
PAINTER, N. S., and TRUELOVE, S. C. (1964). *Gut.* **5**, 201 and 365.
PAINTER, N. S., TRUELOVE, S. C., ARDRAN, G. M., and TUCKEY, M. (1965). *Gut*, **6**, 57.
PARKS, T. G. (1968). *Proc. roy. soc. Med.*, **61**, 932.
PARKS, T. G. (1969a). *Brit. med. J.*, **4**, 639.
PARKS, T. G. (1969b). *Brit. med. J.*, **4**, 642.
PARKS, T. G. (1970). *Gut.* **11**, 121.
PARKS, T. G., and CONNELL, A. M., (1969). *Gut*, **10**, 534 and 538.
PARKS, T. G., CONNELL, A. M., GOUGH, A. D., and COLE, J. O. Y. (1970). *Brit. med. J.*, **2**, 136.
PARKS, T. G., and CONNELL, A. M. (1972). *In Press.*
PICCINNI, L. (1952). *Ann. Ital. chir.*, **29**, 829.
RANKIN, F. W., and BROWN, P. W., (1930). *Surg. gynaec. Obstet.* **50**, 836.
REILLY, M. (1964). *Proc. roy. soc. Med.*, **57**, 556.
REILLY, M. *In Recent Advances in Surgery* p. 504, Ed. S. Taylor, Churchill, London, 1969.
SLACK, W. W. (1960). *Gastroenterology*, **39**, 708.
SLACK, W. W. (1962). *Brit. J. Surg.*, **50**, 185.
SLACK, W. W. (1966). *Gut*, **7**, 668.

SMITH, A. N. *Personal communication.*
SMITH, N. D. (1951). *Amer. J. Surg.*, **82**, 583.
SPRIGGS, E. I., and MARXER, O. A. (1927). *Lancet*, **1**, 1067.
STOUT, A. P. (1923). *Arch. Surg.*, **6**, 793.
TAGLICOZZO, S., and VIRNO, F. (1961). *Ann. Ital. chir.*, **38**, 301.
TELLING, W. H. M., and GRUNER, O. C. (1917). *Brit. J. Surg.*, **4**, 468.
VAGUE, J. (1951). *Arch. Mal. Appar. dig.*, **40**, 1387.
WATT, J., and MARCUS, R. (1964). *J. Path. Bact.*, **88**, 97.
WELCH, C. E., ALLEN, A. W., and DONALDSON, G. A. (1953). *Ann. Surg.*, **138**, 332.
WELLS, C. (1949). *Brit. J. Radiol.* **22**, 449.
WILLIAMS, I. (1963). *Brit. J. Radiol.* **36**, 393.
WILLIAMS, I. (1965). *Brit. J. Radiol.*, **38**, 473.
WILLIAMS, I. (1967). *Radiology*, **89**, 401.
WILSON, R. R. (1950). *Brit. J. Surg.*, **38**, 65.

HYSTEROSALPINGOGRAPHY IN INFERTILITY

by **B. NORMAN BARWIN**

Infertility Clinic, Royal Victoria and Samaritan Hospitals, Belfast

Introduction

THE FALLOPIAN TUBES were first visualised radiologically as far back as 1909 by Nemenow and by Rindfleisch (quoted from Gillespie, 1965). The use of an iodized oil as a contrast medium was reported by Sicard and Forrestier in 1922. In 1926 Beclere in France, and Rubin and Bendick in the United States were the first investigators to report the use of lipiodol for the determination of tubal patency.

Hysterosalpingography has a dual purpose, to demonstrate any abnormalities congenital or otherwise of the uterus and tubes and also to act as a therapeutic measure. White and Green-Armytage stated that it was of unquestionable therapeutic value probably by virtue of the medium used with its small nascent iodine content.

The purpose of this study was to assess the number of conceptions following this procedure in cases of infertility, and also to compare the effects of Salpix (Ortho) and Lipiodol (May and Baker).

Selection of Cases

Five hundred patients who had attended the infertility clinics were sent a reply paid letter requesting the patient to fill out a questionnaire (Table I). All these patients were involuntarily infertile for at least two years. Hystersalpingography is carried out as part of the routine investigation of infertility.

Table I

Name: Age:

Years married:

No. of children before X-ray None/ (number)

Past History: Abdominal operations (e.g. appendicitis)

How soon did you become pregnant after the X-ray (hysterosalpingogram)?

Circle where appropriate:
- Not at all
- 1 month
- 3 months
- 6 months
- 1 year
- 2 years

Did you have any symptoms following the X-ray? Yes/No

If so was the X-ray painful? If so, where?
- Shoulder
- Chest
- Abdomen
- Back

Did you feel faint/weak/nausea?

Did it upset your menstrual cycle: Yes/No.

Materials

There are basically two types of contrast media in use for hysterosalpingography, one a water soluble material, for example Salpix, and the other an oily medium, for example Lipiodol.

Salpix was introduced in 1953 and consists of 53 per cent sodium acetrizoate with poly-vinyl pyrrolidine (P.V.P.) as a carrier medium. It has advantages over oily media as do other water soluble materials in that it does not cause emboli, has a quicker rate of absorption from the peritoneal cavity and also gives a better demonstration of uterine mucosal relief (Gillespie, 1965). Salpix however can cause abdominal pain (Griffiths, 1969) lasting up to two days (Sheach, 1959), and if peritoneal irritation does occur more severe reactions may be encountered than with oily media.

Lipiodol is a poppy-seed oil containing organically bound iodine. The main criticisms of its use are: the occasional intravasation into uterine veins and the occurrence of oil emboli; retention of medium in the fallopian tubes stimulating a foreign body reaction with granulomatous inflammation and iodine idiosyncrasy. The advantages of Lipiodol are: the contrast in the X-rays is superior; the delayed absorption gives a better 24 hour picture and may be a factor in maintaining tubal patency for a longer period of time. Gillespie (1965) reports a much better conception rate with Lipiodol than with water soluble media.

Technique

The test was carried out between the 7th and 12th day of the patient's menstrual cycle. This is considered important for three reasons (Cron, 1965). Firstly, restoration or improvement of tubal patency several days before ovulation enhances the possibility of pregnancy. Secondly, it is unlikely that an early pregnancy will be disturbed and thirdly, the danger of embolism appears to be less at this time.

The procedure was generally performed on an out-patient basis without sedation. The patient reported to the radiology department having fasted for six hours. The patient was placed on the radiology couch in the dorsal position. The vulva and vagina were washed with "Savlon" and a bivalve vaginal speculum inserted. The cervix was grasped with a tenaculum forceps and a Leech-Wilkinson cannula inserted into the cervix. By exerting pressure on the cannula and counter-traction on the forceps, a watertight junction was obtained with the cervix. Five to eight ml. of normal Salpix or Lipiodol was slowly injected without undue pressure while the uterus and fallopian tubes were being screened. In an occasional patient as much as 15 ml. was used. Care was taken that the contrast media filled the cannula before it was injected into the uterine cavity since air bubbles may produce an artefact. One or sometimes two X-rays were taken at some time during the procedure to demonstrate any abnormality or free spill from the fallopian tubes. If there was any doubt about spill a 24 hour film was taken.

Over the past 5 to 10 years hysterosalpingography has been improved by the use of image intensification and it is possible to record the process of the filling of the uterus and tubes with intraperitoneal spill if it occurs, or to take spot X-rays.

Results

Two hundred and forty-eight patients (49 per cent) out of the five hundred replied.

Eighty-three per cent of the patients were between 20 and 30 years of age and the periods of infertility varied from two to five years. Of the total 248 patients, 82 (33 per cent) were pregnant 2 years after the procedure. Table II illustrates the time interval between hysterosalpingography and conception. Fifty-four per cent conceived within three months and 29 per cent between three and six months. It can be concluded that 83 per cent of the patients who became pregnant did so within six months of hysterosalpingography.

Of the primary infertility group of 202 women 27 per cent became pregnant, whereas in the secondary infertility group of 46 subjects 59 per cent became pregnant. A higher pregnancy rate following hystersalpingography in secondary compared with primary infertility is well known (Cron, 1965; Geary et al., 1969).

TABLE II

Conception in 82 patients following hysterosalpingogram

	Number	*Percentage*	
0–3 Months	44	54	83
3–6 Months	24	29	
6–12 Months	10	12	
1–2 Years	4	5	

The selection of patients may have affected the results of this study. It could be argued that a higher percentage of non-pregnant patients would reply to the questionnaire in the hope that something could be done for them. However, if this was in fact the case, one would not have expected such a high percentage of success in the secondary infertility group.

The contrast media used made no difference to the number becoming pregnant in this study. This is in contrast to the findings of Gillespie (1965); using Lipiodol in 1958, 41 per cent of patients conceived within one year of hysterosalpingography, changing to a water soluble contrast medium only 27 per cent conceived; then changing back to Lipiodol again the conception rate returned to 44 per cent.

Salpix caused a higher incidence of nausea and abdominal pain than did the Lipiodol (Table III). A series of 52 patients given Salpix, Griffiths (1969) reported that 33 experienced abdominal pain, 2 nausea, 6 faintness and 3 collapsed. In the same paper, patients who were given Urografin (another water soluble medium) had an even higher incidence of side effects.

TABLE III

Comparison of Salpix and Lipiodol

	Total	*Pregnant*	*Nausea*	*Pain*
Salpix	60	20 (33%)	12 (20%)	36 (60%)
Lipiodol	188	62 (33%)	4 (2%)	42 (24%)
	248	82 (33%)	16 (6%)	78 (31%)

There were 37 (15 per cent) abnormal hysterosalpingograms; the results are shown in Table IV. The principal abnormality was unilateral blockage. No tubes were demonstrated in three patients. Paracervical isoxsuprine or inhalation of amyl nitrate was not used in these patients in an attempt to counteract tubal spasm should it have existed. It is interesting to note that only four patients with one patent tube became pregnant in the whole series.

TABLE IV

Abnormal hysterosalpingography findings

One tube only outlined	19 (8%)
Bilateral hydrosalpingx	7 (3%)
Filling defect in uterine cavity (fibroids)	5 (2%)
No tubes outlined	3 (1%)
Bicornate uterus	3 (1%)
Unicornate uterus	1 (0.25)%
	38 (15%)

DISCUSSION

The advantages of hysterosalpingography in established tubal patency are well recognised and its value in diagnosing congenital abnormalities of the uterus cannot be surpassed. In this small series some 15 per cent of abnormalities have been found.

Before an evaluation of the effectiveness of any therapy can be made a reasonably accurate knowledge of the behaviour of untreated infertile couples should be acquired. It has been found by many workers (Weir and Weir, 1961; Saulton, 1960), that ten per cent of all couples arrive at the end of their reproductive life without any children, whilst Buxton and Southam (1955) reported an impressively large series of patients attending an infertility clinic who had a 15 to 19 per cent conception rate. The available medical literature on hysterosalpingography indicates variation in the conception rate following this procedure (18–75 per cent). Many factors account for this discrepancy: (i) the duration of infertility prior to hysterosalpingography; (ii) the length of time after the procedure to the time of conception; (iii) whether other forms of treatment were used simultaneously or preceded hysterosalpingography.

It is suggested that the therapeutic effect of hysterosalpingography acts by causing mechanical clearing of the tubes by dislodging mucous or breaking down fine adhesions. Robins and Shapira (1931) demonstrated the release of tubal adhesions by the injection of Lipiodol in a post mortem specimen. Other possibilities are: (i) bacteriostatic action upon the mucous membranes of the uterus and tubes; (ii) stimulation of ciliary activity of the tubal epithelium; (iii) the iodine may stimulate the activity and longevity of the spermatozoa; (iv) a more favourable environment may be established for the ascent and penetration of the spermatozoa; and (v) iodine may have fibrinolytic value in reducing the oedema of the tubal wall.

The results in this series using either Lipiodol or Salpix are significant and it is our contention that hysterosalpingography plays an important role in the treatment of infertility. This opinion is shared by many workers (Weir et al., 1961; Green-Armytage, 1943; Cron, 1965). Many factors must be evaluated in treating infertility and more than one factor may be involved. Hysterosalpingography is not the panacea for all infertile females, it is however useful in excluding tubal and uterine factors and, as pregnancy occurs within three months in 50 per cent, the possibility of a therapeutic effect must exist.

Summary

Two hundred and forty-eight hysterosalpingograms have been reviewed. The primary indication for the test was infertility. There was an overall pregnancy rate of 33 per cent. The pregnancy rate of the primary infertility group was 27 per cent and 59 per cent in the second secondary infertility group. Of the patients who became pregnant 83 per cent did so within six months. There was no difference in the percentage becoming pregnant following the use of Salpix or Lipiodol. Uterine or tubal abnormalities were found in 15 per cent of the cases. It is suggested that hysterosalpingography has a therapeutic effect in overcoming the tubal factor in infertility.

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References

Beclere, C. (1926): *Gynéc. et Obstet.*, **14**, 105.
Behrman, S. J. and Poppy, J. H. (1957): *Canad. med. Ass. J.*, **77**, 938.
Buxton, C. L. and Southam, A. (1955): *Amer. J. Obstet. Gynec.*, **70**, 741.
Cron, R. S. (1965): *Aust. N.Z.J. Obstet Gynaec.*, **5**, 12.
Geary, W. L., Holland, J. B., Weed J. C. (1969): *Amer. J. Obstet. Gynec.*, **104**, 687.
Gillespie, H. W. (1965): *Brit. J. Radiol.*, 38, 301-302.
Green-Armytage, V. B. (1943): *J. Obstet. Gynaec. Brit. Emp.*, **50**, 23.
Griffiths, H. J. L. (1969): *Brit. J. Radiol.* **42**, 835.
Heuser, C. (1925): *Lancet*, **2**, 4.
Nemenow, A. (1909): *Staatsver;* ag Bd., 2, 597.
Palmer, A. (1960): *Fertil and Steril.*, **11**, 311.
Rindfleisch, W. (1910): *Berl. klin., Wschr.*, **47**, 780.
Robins, S. A. and Shapira, A. A. (1931): *New Engl. J. Med.*, **205**, 380.
Rubin, I. C. (1947): *Surg. Gynec. Obstet.*, **54**, 733.
Rubin, I. C. and Bendick, A. J. (1926): *Amer. J. Roentgenol.*, **16**, 251.
Sicard, J. and Forrestier, J. (1922): *Bull Soc. Med. Paris.* **46**, 463.
Sheach, J. M. (1959): *J. Fac. Radiol. (Lond.)*, **10**, 103.
Southam, A. L. (1960): *Fertil and Steril.*, **11**, 543.
Weir, W. C. and Weir, D. R. (1961): *Fertil and Steril.*, **12**, 443.
White, M. M. and Green-Armytage, V. B.: "The Management of Impaired Fertility", Oxford Press.

CAREERS*
At Least We Should Try!

A. GORDON SIGNY, F.R.C.P.
Assistant Director of the British Postgraduate Medical Federation and Regional Postgraduate Adviser to the South-West Metropolitan Regional Hospital Board

LOOKING BACK over the years it is fairly obvious that there has been little or no career guidance in medicine. Apart from the odd chat with a senior – often not much senior to the young graduate himself – nothing was readily available to the newly qualified doctor about future prospects in the great variety of medical fields – prospects, that is, of training needs facilities or vacancies. Yet little was heard of any frustrations – probably because the ratio of jobs to doctors was higher and few doctors needed to remain in unsatisfying employment.

There were many gifted young doctors with brilliant student careers behind them who felt they had a chance of being appointed to the staff of their own teaching hospital and who hung on in other subsidiary posts such as anatomy or pharmacology in the hope that they would be better prepared for the next senior staff vacancy.

However, these vacancies occurred only rarely with the death or retirement of senior staff – often occurring in alarmingly rapid succession to be followed by an exceptionally long latent period – and these men mostly made their marks and found niches in other teaching hospitals or in the larger provincial non-teaching hospitals. It was mainly the highly qualified and well experienced surgeons, physicians and gynaecologists who fell into this category; they had chosen their paths in a most single minded way early on in their careers and were not to be budged from their decision and dedication.

Enquiry into other specialties often showed however that it was a chance vacancy at a particular moment which had introduced the young doctor to his final specialty – a locum HS in ophthalmology, or otolaryngology, or a junior temporary demonstratorship in pathology had provided an opportunity for an insight into a specialty not achieved during student days. Similarly, a chance locum in an attractive general practice was the determining factor for the young doctor's choice both of career and location. Maybe there was a degree of inertia, in the past, for, having started in such posts it was easier to stay in them and go up the promotion ladder, especially if the prospects looked attractive – rather than seek new fields of experience.

Present Day

Surveys of student intentions as to their careers nowadays rarely reveal many new trends, except a peculiar swing to and from general practice – the cynics will

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*In view of its importance to all concerned in post graduate medical training this article from *Teach-in* – the journal for junior hospital doctors and medical students – is reproduced by kind permission of the editor and Update Publications Ltd.

say that this varies with the financial rewards of general practice. However, a certain proportion of medical students, especially those from medical families, have, as would be expected, already made up their minds when they start at medical school that they will be following in father's or uncle's footsteps into a particular branch of medicine. The difficulty about the other students is that they do not have much insight into the great variety of possible careers in medicine and are rather heavily exposed in their formative years to the attraction and glamour of the senior medical, surgical and gynaecological consultants and their work. Which young medical student does not have a secret desire to become successor to the Knight who is so brilliant a surgeon and successful a man!

The students necessarily spend the greatest amount of their clinical time in the general medical and general surgical wards and out-patients and the brightest and more ambitious students will be fired with ambition and set their aims and aspirations at this high level.

The next exposure to general medicine and surgery is at the pre-registration year when another full year may be spent as resident. This orientation towards hospital specialist medicine, often in the climate of thinly veiled criticism of the general practitioner who sends the patients – especially by the junior and middle grades of hospital staff – creates an unfortunate impression on the student towards general practice and it is little wonder that those not already committed, and who have seen little or nothing of general practice, do not even consider this as a possibility unless they fail to get on the consultant ladder. This tends to produce a frustrated general practitioner, perhaps with an F.R.C.S. or M.R.C.P. to show for his years of hospital apprenticeship.

I believe that there is inadequate exposure of undergraduates in their formative and impressionable years to the many facets of medicine in its widest possible range, not only for their educational and training importance but also to provide an insight into careers which are available and the great satisfaction which can be obtained in most of them. Even now only one or two weeks, either compulsory or as an elective period, may be the total amount of time devoted in the curriculum to an introduction to general practice – or family practice or the practice of primary medical care. In a very recent visit to a country hospital I found some recently qualified doctors who had had no lectures on, nor contact with any general practitioners throughout their whole student curriculum!

In some new medical school considerable thought has been given to a reorientation of the whole curriculum so that students are given this view of medicine – i.e., family and community medicine as the first periority. Every course is built up thereafter on this basis. In a new medical school in Turkey students are exposed from the very beginning to general practice, family practice and community medicine and have to assist in such practices for a number of hours each day from their first year as medical students – thus providing a proper orientation. After all, if some 40 or 50 per cent of our students are destined to become general practitioners we surely must encourage the proper teaching of good general practice as soon as possible in their careers. To emphasise this same point once more, vocational training programmes for general practice, which are now being advocated for two or three years of post-registration training, are still so

arranged that two out of the three years will be spent in *hospital* posts – thus making a total of seven out of the student's total of eight years (or eight out of nine if three years vocational training are needed) to be spent in *hospital practice* and only one in the *total general practice* atmosphere.

Career Guidance

I have made a practice of speaking to individuals and to groups of junior doctors and discussing their career prospects with them and am aghast to find that hardly one of these young men and women have ever spoken to anyone but their immediate seniors about their careers, and even that is rare.

In one general practice which has taken some 100 senior medical students over the years, it was found that only about ten had a firm idea of what they wanted to do, and another 20 had a vague idea as to their future but the majority were looking to the final examinations and no further.

Dr. J. O. F. Davies, Secretary to the Council for Post-graduate Medical Education, has said on the C.C.T.V. to London Medical Schools that out of a cohort of 100 graduates about three will become consultants in general medicine and a similar number in general surgery, four will become anaesthetists, two obstetricians, between four and five psychiatrists, two radiologists, two traumatic and orthopaedic surgeons, four pathologists. Then in practically all the other disciplines less than one in that 100 will become consultants. There will be a need for more than 50 of that cohort of 100 in general practice. This must surely be publicised as widely as possible and must be the basis of career guidance taken together with the inclinations and the aptitudes of the young doctors.

Occasionally a H.S. will have been recommended by his chief to go off and take his Primary F.R.C.S. before taking another job if he wishes to continue in surgery and similarly the hurdle of the Membership looms large in the vision of young H.Ps. and S.H.Os., but this is only regarded as a barrier to be overcome after which he will look around and apply for posts. Most of the career guidance at this level comes in fact from chance discussions between fellow students, house officer colleagues and registrars.

What we must avoid at all costs is the 'drifting post-graduate'. Some post-graduates have seen the 'charts' and the 'starred' careers but have taken little or no notice of them, yet the published figures show how slender are the chances of the average student to rise from S.H.O. to Registrar and on to Senior Registrar. Yet when questioned they are mostly prepared to take this chance in order to do surgery (or medicine or gynaecology). They therefore prepare themselves for Primary and Fellowship exams and will have held S.H.O. and Registrar posts with a great deal of surgical experience only to find that they are baulked at the next level. After years of hard grind and donkey work and long, long hours of emergency and casualty posts, they give up the ghost and go abroad. What a waste to this country and yet who would blame them? Occasionally one meets a senior 'time expired' Registrar and even now still a 'time expired' Senior Registrar who refuses to go abroad for a variety of family reasons or because he values the quality of life – medical or non-medical but more often the latter – which obtains in this country.

Many worse circumstances may be found amongst some of the overseas graduates who, though filling many junior posts, seem rarely to achieve Senior Registrar status which could lead to a consultancy. Yet many of them are now occupying their fourth or fifth consecutive surgical or gynaecological post in hospitals where, of course, their extensive and recent experience will be of the greatest value – but they could hardly be said to be occupying training posts, nor are they in any way consolidating their careers.

Yet if you murmur to any of these doctors that there are 83 consultant vacancies in radiology in the country as a whole or suggest re-training, they are hurt that they should be so relegated and regarded as failures! When you press further you find that they are not even vaguely aware of what a consultant radiologist really does or what his department undertakes. They have never really been exposed to the range of work of such a department either as undergraduates or postgraduates. Perhaps more academic departments of radiology are required to give the specialty increased academic status not least in the eyes of the student.

How can we ensure an adequate supply of consultants in this specialty and others which are undersubscribed? How can you persuade a young doctor that in your opinion he would be well suited to a post in laboratory medicine – that you think his scientific outlook and background training is ideally suited to a career in say, clinical chemistry, when he believe he is God's gift to surgery?

Occasionally, easy passage to a consultancy with good planned posts and perhaps smooth promotion will attract a man when he faces what was described to me by a bright young graduate as the 'rat race' in other popular specialties. However, it may be true that this very competitiveness does produce the top men whereas other methods may encourage mediocrity. I do not fully subscribe to this but there may be a germ of truth in it. Progress in a specialty must be neither too easy nor too hard. We must, however, positively encourage anyone with an aptitude towards those specialties which have obvious and readily achieved goals, and perhaps discourage the long-term plodder who may reach consultancy later in life after long experience and much heartache for himself and his family, but with little or no flair.

In the projected redistribution of manpower much thought must be given to the redistribution between the North and the South and between university and district hospitals, and as many firmly and intelligently linked appointments as possible must replace the old rather inbred ladders of promotion of some famous hospitals.

The most important preliminary to this must be a great drive in career guidance.

Future Career Guidance

How can we start at least to make general practice and the 'minor' specialties attractive? Are there perhaps special aptitudes which the educationalist and careers specialist could identify for us which would enable us very early to spot a man clearly marked out for radiology or biochemistry or ophthalmology for example (we all easily recognised the potentially successful gynaecologist, even as students!). If so, what inducements can we offer such a man to make him

believe that he has this potential and also possibly as high a future as if he went into neurosurgery.

With the Colleges and Faculties all proposing new and lengthy training schemes and granting recognition of posts for vocational training, we should know the manpower position clearly and match it to the demands of each specialty and the opportunities already existing. Perhaps this could be done by some 'negative' direction by limiting the number of registrar posts in the popular specialties which offer little future to so many registrars, and positively increasing the number of registrars in other specialties such as anaesthetics, radiology, pathology, haematology, biochemistry, bacteriology, E.N.T., ophthalmology, etc. Senior Registrars are already restricted and we must go further down the ladder and prevent young doctors becoming too committed in the overcrowded specialties. Yet this will have to be equated to the heavy service demands in the main clinical disciplines in hospitals. Perhaps this is where increased involvement of the general practitioner in positions of responsibility – non training posts – in hospitals will be most helpful.

It should also be noted that even when he has decided upon a speciality, a young doctor still needs guidance within the specialty. This decision sometimes needs to be taken rather too early before the man has had a good look around the prospects within the specialty. For instance, specialisation in orthopaedics can really only take place after the Fellowship and now there are planned training programmes in several regions. In pathology, where in this country we no longer train or employ general pathologists, specialisation within pathology has to be decided upon perhaps too early – in order to take that one subject within pathology even at the Primary examination level (albeit together with a multiple choice paper which covers the whole field). Perhaps this sort of guidance will become easier when vocational training programmes have eventually been agreed. But even this would not be enough unless at the same time these new posts were seen to be attractive training posts with bright career prospects.

Talks on careers in medicine are as important to the fourth and fifth year medical student as they are to the sixth former at school. Yet at schools they have careers masters, speakers and lecturers available all the year round.

Who shall undertake this guidance? It could be the Medical School Dean or Sub-Dean appointed by the School to deal with the new graduates in their pre-registration year, but my experience is that they are usually pretty fully committed with school and hospital and university affairs as well as their own specialty. Each School should, however, have a careers section in the Dean's Department and should arrange series of talks by senior and successful practitioners of all the branches of medicine. First and foremost a successful family doctor. He should be in an established general practice, preferably group practice or in a Health Centre, on the senior teaching staff of the Medical School and dedicated to spreading the doctrine of family practice. In addition to undertaking teaching in the hospital and in the practice he should regularly take students into the practice working there for not less than a month at a time. Such elective periods in other specialties are already useful for career planning.

The physicians and surgeons should be allowed their say (!) but only in the context of the whole series of talks by all other specialists. T.V. might also play a part, and career guidance programmes on medical television channels might be at least as important and rewarding as talks on obscure endocrinology. The wide sweep of medicine with all the opportunities which present, particularly with details of careers which a young doctor normally rarely thinks about like public health or community medicine, epidemilogy, venereology, physiology, aviation medicine, the newer forms of medical administration and even medical journalism would make a wonderfully fascinating picture and would, I believe, be compulsive viewing for the medical student and young graduate. This material could be shown at medical schools and the medical centres where the Postgraduate Deans and Clinical Tutors must, I feel, make career guidance one of their important duties.

Career guidance should thus be the responsibility of the Postgraduate Committee in each region. For the time being, only broad guide lines can be laid down, and detailed guidance will only be possible when the Council for Postgraduate Medical Education, the Royal Colleges and their Faculties, the Department of Health, and the Universities have an agreed policy on manpower for the professions a whole and for each specialty within the profession, when vocational training programmes have been agreed and recognised, and specialist registers inaugurated.

This may sound a long way off, but it is surely a matter of urgency that we press for a solution to the chaos which exists and which is reflected in the bewildered and perhaps cynical outlook of our young doctors. At least we should try!

BOOK REVIEW

ANTIBIOTIC AND CHEMOTHERAPY by L. P. Garrod, M.D., Hon. LL.D., F.R.C.P. and F. O'Grady, T.D., M.D., (Lond.), M.Sc., M.R.C.Path. Third Edition (Pp. ix+499; figs 39. £3.50). Edinburgh and London: Livingstone, 1971.

THIS third edition is an expanded version of its predecessor retaining its qualities and general format, and adding new stores of information and advice of wide importance. The contents are clear, well-balanced, authoritative, and informed with commonsense; qualities that experience leads one to expect of this useful and important work.

It should be available in every practice, hospital ward, teaching department and laboratory —there can be few fields in medicine where it does not have some part to play, and few to whom it cannot offer some practical use. It would be difficult to overstate its value, and it is a very good buy.

The physicians and surgeons should be allowed their say (!) but only in the context of the whole series of talks by all other specialists. T.V. might also play a part, and career guidance programmes on medical television channels might be at least as important and rewarding as talks on obscure endocrinology. The wide sweep of medicine with all the opportunities which present, particularly with details of careers which a young doctor normally rarely thinks about like public health or community medicine, epidemilogy, venereology, physiology, aviation medicine, the newer forms of medical administration and even medical journalism would make a wonderfully fascinating picture and would, I believe, be compulsive viewing for the medical student and young graduate. This material could be shown at medical schools and the medical centres where the Postgraduate Deans and Clinical Tutors must, I feel, make career guidance one of their important duties.

Career guidance should thus be the responsibility of the Postgraduate Committee in each region. For the time being, only broad guide lines can be laid down, and detailed guidance will only be possible when the Council for Postgraduate Medical Education, the Royal Colleges and their Faculties, the Department of Health, and the Universities have an agreed policy on manpower for the professions a whole and for each specialty within the profession, when vocational training programmes have been agreed and recognised, and specialist registers inaugurated.

This may sound a long way off, but it is surely a matter of urgency that we press for a solution to the chaos which exists and which is reflected in the bewildered and perhaps cynical outlook of our young doctors. At least we should try!

BOOK REVIEW

ANTIBIOTIC AND CHEMOTHERAPY by L. P. Garrod, M.D., Hon. LL.D., F.R.C.P. and F. O'Grady, T.D., M.D., (Lond.), M.Sc., M.R.C.Path. Third Edition (Pp. ix+499; figs 39. £3.50). Edinburgh and London: Livingstone, 1971.

THIS third edition is an expanded version of its predecessor retaining its qualities and general format, and adding new stores of information and advice of wide importance. The contents are clear, well-balanced, authoritative, and informed with commonsense; qualities that experience leads one to expect of this useful and important work.

It should be available in every practice, hospital ward, teaching department and laboratory —there can be few fields in medicine where it does not have some part to play, and few to whom it cannot offer some practical use. It would be difficult to overstate its value, and it is a very good buy.

THE NORTHERN IRELAND COUNCIL FOR POSTGRADUATE MEDICAL EDUCATION*

Foreword by EMERITUS PROFESSOR SIR JOHN H. BIGGART, C.B.E., M.D., D.Sc., F.R.C.P.(Lond.), F.R.C.Path., F.R.C.G.P.,
Chairman of Northern Ireland Council

WHILST in Northern Ireland arrangements for postgraduate training were developed through the Postgraduate Board of the Medical Faculty as early as 1965, a great stimulus to further development in postgraduate training was given by the publication of the Report of the Royal Commission on Medical education. Refresher courses for general practitioners were already well developed, and training committees for the surgical and anaesthetic specialists had already reached a high standard of competence. However, with the report of the Todd Commission it became obvious that a much broader approach to postgraduate education was necessary. The Royal Commission differentiated between 'academic' and 'professional' training and recommended that while the former was a proper charge on the universities the latter should be paid for by the National Health Service.

Further, with the development of more and more specialisation within the hospital services, it became apparent that the young graduate required more career guidance, and that having embarked on a specialty further advice was needed for his training and his direction and its successful conclusion. Obviously, too, some mechanism for the competent correlation between academic training and service commitment and opportunity for clinical experience had become necessary. Deans of medical schools, postgraduate deans, university professors have all in their time endeavoured to satisfy these needs, but there was never the desired continuance of supervision in training or the necessary solution for the non-conformist individual.

An attempted solution of these problems has been sought in the establishment of Postgraduate Councils of Medical Education—one for England and Wales, one for Scotland and one for Northern Ireland. In Northern Ireland the Council is composed of members who can speak on behalf of Queen's University, the various Royal Colleges and professional bodies, the Ministry of Health and Social Services, the Hospitals Authority, the General Health Services Board, the British Medical Association and the Society of Medical Officers of Health. By ensuring that many members represent more than one interest the number of Council has been confined to 25.

The Council has now been in existence for one year. It has appointed a series of training committees in the various specialties, which will advise each and every trainee on the rotational appointments which he should pursue. Every effort is being made to keep programmes elastic so that each individual, within

* The Journal acknowledges generous financial support from the Council for Postgraduate Medical Education.

the overall necessity of obtaining recognition, should be able to pursue his natural inclinations. As its function is guidance in 'professional training', a close liaison has been established with the Hospitals Authority so that professional requirements and service commitments are as closely correlated as possible.

It is hoped to give advice to the pre-registration doctors early in their career. We also hope that all subsequent appointments as S.H.O. and Registrar will be centralised and that the Council will play an important role in giving advice on such appointments.

In the ultimate the Council is purely an advisory body—advisory to the Ministry, advisory to the Hospitals Authority, advisory to the Faculty. Possibly because it has no executive power it will have a greater influence on the professional training of medical graduates. Possibly because of the peculiar circumstances in Northern Ireland and of the intimate relationship which happily exists between the various bodies controlling medical education and medical services it will attain a degree of competent success and ensure that our local graduates will continue, as heretofore, to compete on equal terms with the best graduates of other schools and other regions. We hope that the recent graduate will realise that the Council has as its main object his professional welfare, and that it is so constituted that the best advice that the local profession can provide will always be readily available to him.

PROGRAMME FOR 1972

Council has now been in existence for just over a year and during this period has been finding its feet.

It has moved to temporary premises at 107 Botanic Avenue, Belfast, BT7 1JP and has enlarged its staff by the appointment of Mr. J. A. Refaussé as Administrative Officer and Dr. N. D. Wright as Postgraduate Adviser in General Practice with responsibility for the Northern Ireland General Practice Vocational Training Scheme and for the continuing education of practitioners.

Its sights for 1972 are set on three main objectives.

First, a major effort to do something about postgraduate training and re-employment of women doctors.

Many women doctors give up practising medicine, either when they marry or once they start having children. Although many of them return to practice when domestic circumstances permit, others may be lost to medical work. The contribution married women can make to staffing in general practice and in hospitals is vitally important. Nearly 500 women qualified last year and women constitute a rising proportion of a rapidly increasing annual entry to medical schools. If the tendency of women doctors to leave practice on marriage or on having children continues, this will mean increasing losses from the profession as a whole. It is therefore important to do everything possible to enable married women doctors to pursue medical careers. Otherwise, it will not be possible to provide the growing numbers of doctors essential for development of the service.

Many feel that it is imperative that women doctors should always keep a foot in the door, even at considerable financial and domestic sacrifice, and equally

that women doctors should pursue career objectives. If this objective is to be achieved provision will have to be made for extended vocational training schemes and advice sought from the colleges and other professional bodies as to how their vocational training programmes may be amended.

Second, career advice which is of two kinds. First, advice for the uncommitted where the wishes and abilities of the individual seeking guidance must be matched with the opportunities for career posts which lie ahead, and second, advice on vocational training to help doctors who have already chosen their career goal to acquire the qualifications and experience necessary for a career appointment by the most acceptable and appropriate route.

In an attempt to help the first group a questionaire will shortly be despatched to all pre-registration house officers inviting them to give details of their curriculum vitae; to state their career preferences; and to offer them advice from the chairman of the appropriate speciality committee.

The needs of the second group will be met by the various specialty committees whose members will be au fait with the vocational training programmes in each specialty and whose chairmen will act in close liaison with the various service bodies.

The third objective is the approval or recognition of training posts by the various Colleges or Faculties. While this is primarily a matter for the Colleges and Faculties who will inspect and approve posts it is of importance not only to Council but also to the service authorities. Several inspection teams, including orthopaedic surgery, plastic surgery, and urology, have already visited Northern Ireland and it is hoped that all general surgical and general medical posts will be inspected by the end of 1972. This may mean that in a few hospital posts which do not come up to the required training standards may have to be filled by doctors in non-training grades or by general practitioners on a part-time basis. Similarly, the teaching practices which have already been approved for the purposes of the Northern Ireland General Practice Training Scheme will be subject to review by both the General Practice Committee of Council and possibly also by an inspection team from the Royal College of General Practitioners for the purposes of the M.R.C.G.P.

J. E. McK.

ANAESTHETICS COMMITTEE

The Anaesthetics Committee with Professor J. W. Dundee as Chairman, is similar in composition to the old "Training of Anaesthetists" Committee, Drs. S. M. Lyons and J. Moore being from teaching hospitals and Dr. R. King from a provincial hospital. New members are Dr. R. S. J. Clarke from the Department of Anaesthetics and Dr. J. Galway a Senior Registrar. The Committee has met frequently since its inception and dealt with a number of matters pertaining to the training of junior staff. It has not however concerned itself to date with routine classes which are still run by the Department of Anaesthetics as in previous years. There are half-day release classes for both primary and final F.F.A.R.C.S. candidates as well as two one-week intensive courses at each of these levels.

The Committee has involved itself with the suitability of posts for training of anaesthetists, seeing that each junior has an adequate "exposure" to the necessary types of anaesthesia experience and that those in higher grades rotate through the sub-specialties. This has necessitated making certain recommendations to the Northern Ireland Hospitals Authority concerning rotation, particularly in regard to registrars in "country relief" and it will advise the Northern Ireland Hospitals Authority as to the most suitable placement for juniors from year to year. At present it is looking into the lack of dental and E.C.T. teaching facilities in the main teaching hospital groups. The individual requirements of each trainee have been discussed in detail and the Committee is prepared to give advice as regards career structures.

At the request of the Northern Ireland Hospitals Authority the Committee looked at the potential future of junior staffing and having visited every hospital in the Province or consulted the anaesthetists involved has prepared a detailed report which should serve as a useful guide to the new Area Boards. This is based strictly on the number of people who should train in anaesthesia to meet the present and future needs of the specialty and while this has on some ocasions been tied to the service requirements it has not always been possible. Where there has been a discrepancy between these two aspects it was recommended that posts should be filled by service rather than trainee grades.

J. W. D.

COMMUNITY MEDICINE COMMITTEE

"Community Medicine" is the term currently used to describe that branch of medicine which is involved with populations or groups rather than with individual patients. Taken in its widest sense it is the specialty practiced by medical officers of local authorities, medical officer administrators of the hospital services, central government departments and university departments of social and preventive medicine. It requires special knowledge of the principles of epidemiology, of the organisation and evaluation of medical care systems, of the medical aspects of administration of the health services, and of the techniques of health education and rehabilitation which are included within the field of social and preventive medicine. As the functions of all doctors working in this field are closely related there are no intrinsic differences in the requirements for their basic training, or in the techniques they employ.

In some fields such as environmental health and sanitation the functions which brought organised community health services into being are passing out of medical hands. Nevertheless medical leadership in community medicine is as important as ever. Wider fields of opportunity will undoubtedly open and specialist training in this branch of medicine will be all the more essential. Recruitment of young doctors to community medicine has within recent years not been satisfactory as the medical curriculum has tended to direct students' interests mainly to the cure of illness and the care of individual patients. In the new curriculum much more emphasis is placed on the social aspects of health and disease, stressing the importance of prevention, patient welfare and health education. For young doctors expressing an interest in community medicine as a career it is

important that proper systems of training are introduced and that trainees should see, in this specialty, prospects clearly as good as those in other specialties.

The two main clinical services in which doctors are employed in local health authorities are child health and school health. For the foreseeable future these services will continue under the new health authorities and it is important that doctors engaged in them will have an opportunity of specialised training and refresher courses which they need in this chosen field of practice, e.g., infant welfare, child care, school health, etc. The establishment of such courses is at present under consideration by Council. Specialised training courses for general practitioners will also ensure that they can become more closely identified with these child care services which have for many years been the responsibility of local health authorities.

Until the present almost all formal post-graduate courses in community medicine have led to the Diploma in Public Health, this qualification being registrable by the General Medical Council and obligatory for doctors holding the post of Medical Officer of Health. The profession has been aware for some time of the need for a professional body which could embrace all the interests, academic and practical, involved in this specialty and the support and strength to undertake the assessment needed during and at the end of general professional training. In this connection a Working Party composed among others of representatives of the Royal Colleges of Physicians (London, Edinburgh and Glasgow) and representatives of the Society of Medical Officers of Health, the Society of Social Medicine and the Department of Health and Social Security has studied the problem over the past twelve months and a recommendation has now been made to the Colleges that they should combine in the formation of a Faculty of Community Medicine which would be part of their own structure. It is envisaged that membership of the Faculty will be the recognised specialist qualification for those doctors in the future who make community medicine their career.

In order that Council may be fully informed and continually up-to-date with developments, it has appointed a Community Medicine Committee which submits reports to meetings of Council. This Committee will act as a liaison and careers advisory body and will have close links with similar committees in England, Wales and Scotland. The Committee consists of the Dean of Faculty of Medicine, the Chief Medical Officer of the Ministry of Health and Social Services, the Medical Officers of Health of Belfast and County Down, the Senior Administrative Medical Officer of the Northern Ireland Hospitals Authority and the Secretary of Council. The Chairman is Dr. J. McA. Taggart, Medical Officer of Health, Belfast, who is available to advise undergraduate and postgraduate students on matters concerning career prospects in Community Medicine.

J. McA. T.

GENERAL PRACTICE COMMITTEE

The members of the General Practice Committee are:—Dr. J. E. McKnight, Chairman, Dr. H. Baird (Ballyclare), Dr. J. M. Brown (Castlederg—representing younger practitioners), Dr. J. J. Doherty (Enniskillen), Dr. T. Horner (Belfast), Dr. R. P. Maybin, Professor W. G. Irwin and Dr. N. D. Wright.

The Committee advises Council on matters relating to General Practice and including the appointment of teaching practices and the selection of trainees.

The Council has recently appointed Dr. Wright Postgraduate Adviser in General Practice on a part-time basis and he will now carry out most of the work in the general practice field previously done by Dr. McKnight. The main areas of his work will be continuing education for general practitioners, the vocational training scheme and career advice for general practice.

Less reliance is now being placed on formal courses as a means of continuing postgraduate education. Instead meetings in medical centres, health centres, hospitals and elsewhere organised locally by clinical tutors, college tuors, medical societies, B.M.A. divisions, etc., are being encouraged. This means that doctors have shorter distances to travel, can attend lunchtime, afternoon or evening meetings without the need for a locum and at the same time it increases local contact between general practitioners and hospital and local health authority service doctors.

It is the Committee's opinion that many general practitioners are no longer content to listen to didactic lectures but prefer to participate more actively in continuing education. Therefore it is encouraging general practitioners to act as chairmen of sessions, present papers or clinical cases and to take part in discussion. Tutors of the Royal College of General Practitioners who have been appointed in most areas in Northern Ireland, have a key function to fulfil in this respect, as part of their remit is to assist clinical tutors in arranging general practitioner participation.

The appointment of Professor W. G. Irwin to the Chair of General Practice is an event of major importance for general practice in Northern Ireland. While his main responsibility will be in undergraduate education, a Department of General Practice will produce a marked effect in the postgraduate field.

There are at present 35 young doctors in the vocational training scheme and of these nine are attached to teaching practices. One will finish training on 1 February 1972 and eight on 1 August 1972. On completion of their training they are encouraged to take advantage of the extended study leave facility which enables them to study practice outside Northern Ireland. This usually means an attachment to two practices in Great Britain for periods of a fortnight each.

The following general practitioners have obtained postgraduate qualifications:

M.R.C.G.P.

Dr. J. M. Brown, Castlederg; Dr. J. Hendron, Belfast; Dr. O. Hunter, Belfast; Dr. B. J. Ireland, Lisburn; Dr. W. W. Jefferson, Ballyclare; Dr. P. G. McClements, Newtownards; Dr. J. R. McCluggage, Belfast; Dr. R. L. Miller (with distinction) Belfast; Dr. W. J. Montgomery, Dundrum; Dr. J. B. Pitt, Belfast; Dr. F. J. Porter, Lisburn; Dr. D. S. Rainey, Randalstown; Dr. R. J. Richardson, Belfast; Dr. J. D. Simpson, Ahoghill; Dr. W. G. C. Trimble, Belfast.

F.R.C.G.P.

Dr. D. Cuming, Belfast; Dr. F. C. Calvert, Limavady; Dr. O. M. Anderson, Killough; Dr. J. J. Doherty, Enniskillen.

D.C.H.

Dr. A. Graham, Belfast.

Trainees have also obtained:

D.R.C.O.G.

Dr. S. Moore, Lisburn; Dr. A. Thompson, Belfast.

N. D. W.

OBSTETRIC AND GYNAECOLOGICAL COMMITTEE

The members of this Committee are:

Mr. R. S. Casement, Mater Infirmorum Hospital; Dr. R. J. Hunter, Postgraduate Tutor and South Belfast Hospital Group; Dr. T. J. M. Myles, Lurgan and Portadown Hospital, Lurgan; Mr. J. F. O'Sullivan, Council and South Belfast Hospital Group; Dr. R. M. Shearer, General Practitioner, Belfast; Dr. C. R. Whitfield, Belfast and South Belfast Hospital Groups and Professor J. H. M. Pinkerton—Chairman.

This Committee concerns itself with postgraduate education in Obstetrics and Gynaecology in Northern Ireland relative to the training of specialist obstetricians and gynaecologists and also to continuing education in obstetrics and gynaecology for family doctors. There are at present about forty trainee specialists in obstetrics and gynaecology in Northern Ireland, and in the past five years some 50 have succeeded in passing the M.R.C.O.G. examination. The Committee is responsible for the rotation of these through their various posts during the three years of training. Although S.H.O. appointments are the responsibility of the hospitals concerned we have been able to centralise these appoinments in the Belfast area. We hope eventually that similar arrangements may be made throughout the Province to include such other hospitals as may wish to be associated with a centralised scheme. At registrar level of course the Hospitals Authority is responsible for all appointments and the Committee advises it in detail on these. The Council runs a preparatory course for the primary M.R.C.O.G. examination. In addition it provides a two-year course of lectures, demonstrations and ward rounds in preparation for the final membership examination of the Royal College of Obstetricians and Gynaecologlists; Dr. R. J. Hunter, who has overall responsibility for this Course, is a member of the Committee and turns to it for detailed advice on its content and format. The Committee is concerned to maintain and improve the standards of both these courses.

With regard to gynaecology in general practice, including family planning and cervical cytology as well as diagnostic and medical gynaecology, the Committee is considering how best the interests of the family doctors throughout the Province can be served making the best use of all the excellent consultant and hospital facilities available. The Committee is also interested in the organisation of general practice obstetrics and how continuing education in this field, possibly by resident refresher courses in the teaching hospitals, can be improved. The presence of Dr. Shearer on the Committee ensures that a proper balance is maintained during our deliberations on these topics.

J. H. M. P.

Psychiatry Committee

The members of the committee are: —Dr. W. O. McCormick (Chairman, Department of Mental Health), Dr. E. Casement (Holywell Hospital and member of Council), Dr. W. A. G. MacCallum (Purdysburn Hospital), Dr. W. B. McConnell (St. Luke's Hospital), Dr. E. Jones (Gransha Hospital), Dr. K. Donan (Downshire Hosipital), Dr. J. B. Walsh (Tyrone and Fermanagh Hospital)), Dr. G. B. Scally (Eastern Special Care Unit), Dr. W. McC. Nelson (Child Psychiatry) and Dr. F. J. Bereen (trainee representative). It was with profound regret that the committee learned of the recent death of the second trainee member, Dr. B. J. Quinn of Gransha Hospital.

The activities of the committee to date have included recommendations to the Northern Ireland Hospitals Authority for postings of trainees and about their study leave. Career guidance is offered by individual members to trainees already in the service and usually by the chairman to would-be trainees.

Plans for a training scheme which could be arranged for all future trainees in psychiatry are being made; they have had to take account of the requirements of training for membership of the Royal College of Psychiatrists. At the time of writing these requirements are only beginning to be made clear.

An *ad hoc* extra psychiatry course was arranged for senior trainees to assist them in preparation for the first examination for M.R.C.Psych. This has been very well suppported in contrast to experience elsewhere reported in the medical press.

The Committee wish to congratulate the following doctors in obtaining higher degrees and diplomas.

Dr. D. J. King, M.D. (Q.U.B.); Dr. S. C. Jain, M.R.C.P. (U.K.); Dr. S. Soni, Ph.D. (Q.U.B.) and D.P.M.

D.P.M.

Dr. G. Fitzpatrick, Dr. D. Nugent, Dr. G. Nolan, Dr. D. M. Young.

W. O. McC.

RADIOLOGY COMMITTEE

In the period since Spring 1971, the Radiology Committee has as its major activity, been planning the implementation of the new Fellowship in Radiology of the Faculty of Radiologists in England. The Faculty of Radiologists, having recognised the enlargement of the scope of radiology and the parallel investigations associated with other physical means of diagnosis, such as radio-isotopes, ultra sound and thermography, has expanded the syllabus considerably, while reducing the amount of theoretical physics that was previously required. As details of this new syllabus have only gradually become available, the latest publication being received just prior to Christmas, this has engaged the Committee exhaustively, as the first candidates will sit the primary examination in early April this year.

The major change associated with the re-organisation of the Health Services in Northern Ireland has created a rather unstable situation but the Committee has also considered the implications of the recognition of the large area hospitals as teaching hospitals and take a unanimously pessimistic view of the capability of the radiological departments of these hospitals being able to achieve a reasonable teaching commitment. This is with the notable exception of Altnagelvin Hospital, but even there staffing accomodation and teaching aids are less than satisfactory.

When one looks forward to the teaching of radiology, one is impressed by the necessity that while radiology will continue, only clinically applied radiology will advance. It is felt that radiology in particular lends itself to the use of teaching machines in training and it is to be hoped that an integrated policy regarding the implementation of the use of teaching aids will be followed in future.

The members of the Committee are: Dr. E. M. McIlrath (Chairman) (Royal Victoria Hospital), Dr. A. D. Gough (Royal Victoria Hospital and The Ulster Hospital), Dr. R. S. Crone (Royal Victoria Hospital and Musgrave Park Hospital) and Lieut. Col. D. G. C. Whyte (Altnagelvin Hospital).

E. M. McI.

BOOK REVIEW

'SCHIZOPHRENIA IN CHILDREN'. J. Louise Despert, M.D. (Pp. vi+215; £3.00). New York: Brunner/Mazel and London: Butterworth, 1971.

THIS book is composed of previously published papers by the author, Dr. Despert, the papers dating from 1937 to 1952. It consists of eleven chapters, each chapter being the subject of a separate previously published paper.

It is quickly apparent from reading through this book that Dr. Despert has had continued and detailed contact with a great number of disturbed children and has recorded in some considerable detail her observations of these children. I feel this is perhaps one of the most valuable aspects of the book.

The title of the book 'Schizophrenia in Children' raises some questions. One school of thought believes that these disturbances are related to adult schizophrenia. Another school feels that the processes occuring in childhood are quite different from those taking place in the adult schizophrenic. There is considerable confusion in the childhood literature about the use of the term 'schizophrenia' and the term 'childhood schizopherenia'.

The papers range from the qualitative or quantitative differences in the disease process in childhood, a fairly detailed examination of delusional and hallucinatory phenomena in children and an examination of the differential diagnosis of obsessional compulsive neuroses and schizophrenia in children with similiar symptoms. There is also a very good description of the psychological disturbance in the parents of the children, although much present-day thinking throws some doubt on the specific nature of this disturbance. Finally there is a very good description of the psychotherapy process with these children .

This is a book one would recommend to anyone working in the field of childhood psychiatric disturbance. It is perhaps not a textbook that would be easily followed by someone only peripherally involved. I feel the individual descriptions of these processes and symptomatology are excellent but like any good examination of the subject it raises a great number of questions to which the answers remain to be found. W.McC.N.

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BOOK REVIEWS

HISTORICAL ASPECTS OF CEREBRAL ANATOMY by Alfred Meyer, M.D. (Pp. ix+230; figs 27; £3.00). London: Oxford University Press, 1971.

THIS careful and detailed history of neuro-anatomical thinking sets present-day concepts in their historical context and fulfils a useful function. As one might expect from the title of the book, the subdivisions are anatomical and the author reviews descriptions of the basal ganglia and diencephalon, the 'olfactory brain' and the cerebral convolutions and fissures from the time of Galen to the twentieth century. The earliest references are among the most interesting and from such writers as Eustachius, Malpighi, Willis and Vieussens, Professor Meyer has selected and shown the development of neuroanatomy. The complexities of the nineteenth century literature are adequately dealt with and although anatomical eponyms are not used, due recognition for important descriptions is given.

This volume is essentially a reference book which will be bought by libraries rather than individuals. Nevertheless it makes interesting reading and will be useful to workers in the neurological sciences. I.V.A.

SAMSON WRIGHT'S APPLIED PHYSIOLOGY. Twelfth Edition by Cyril A. Keele and Eric Neil. (Pp. vii+576; figs. 481. £3.50). London: Oxford University Press, 1971.

THE student of physiology, be he a medical, dental or science undergraduate or a post-graduate working for a primary examination, is faced with a large range of textbooks which may be classified as small, medium and large, and as basic or applied. The small textbook, e.g. Binnion, Green, contains considerable factual information adequate for examination purposes, but there is not much room for detailed explanation and illustration from experimental and clinical sources. The medium-sized textbook, e.g. Ganong, Horrobin, contains more explanation and/or more facts, and is suitable for the average student as a working textbook which he will buy. The larger textbook, e.g. Bell, Davidson & Scarborough, Best & Taylor, Davson & Eggleton and Ruch & Patton, contains many diagrams of original research work, and lists of references which in some cases, would require a lifetime for their complete assimilation. I would classify Samson Wright as one of the smaller of the large textbooks. As such, it is probably best reserved for consultation, or for the student who can cover the basic "facts" without difficulty and is particularly interested in their experimental basis. Despite the book's name, the application of physiological knowledge to the study of human disease processes comprises quite a small proportion of the book, which is mainly concerned with basic physiology.

This latest edition of a textbook dating from 1926 differs from the previous edition in having a more modern style—the pages are smaller, the book is available in soft-back form—and the traditional picture of Professor Samson Wright has been omitted. I was disappointed that the foreword consisted solely of a catalogue of changes since the previous edition, without any suggestion as to the philosophy and aims of the book. My impression is a book crammed with facts, useful for reference by the advanced student or his teacher, but making rather dull reading.Perhaps this is almost inevitable in a venerable textbook gradually brought up-to-date. W.F.M.W.

GROWTH CONTROL IN CELL CULTURES. Edited by G. E. W. Wolstenholme and Julie Knight. (A Ciba Foundation Symposium). (Pp. ix+ 275. Illustrated. £3.00) Edinburgh and London: Churchill Livingstone, 1971.

THE factors which cause cells to divide, as in wounds, to stop dividing when healing is complete, or to start dividing and failing to stop, as in the growth of tumours, are scarcely understood. Cell culture offers a means of searching for and studying these factors separately and this Ciba Symposium, from which only the initiated will get full value, shows

BOOK REVIEWS

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THIS careful and detailed history of neuro-anatomical thinking sets present-day concepts in their historical context and fulfils a useful function. As one might expect from the title of the book, the subdivisions are anatomical and the author reviews descriptions of the basal ganglia and diencephalon, the 'olfactory brain' and the cerebral convolutions and fissures from the time of Galen to the twentieth century. The earliest references are among the most interesting and from such writers as Eustachius, Malpighi, Willis and Vieussens, Professor Meyer has selected and shown the development of neuroanatomy. The complexities of the nineteenth century literature are adequately dealt with and although anatomical eponyms are not used, due recognition for important descriptions is given.

This volume is essentially a reference book which will be bought by libraries rather than individuals. Nevertheless it makes interesting reading and will be useful to workers in the neurological sciences. I.V.A.

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THE student of physiology, be he a medical, dental or science undergraduate or a post-graduate working for a primary examination, is faced with a large range of textbooks which may be classified as small, medium and large, and as basic or applied. The small textbook, e.g. Binnion, Green, contains considerable factual information adequate for examination purposes, but there is not much room for detailed explanation and illustration from experimental and clinical sources. The medium-sized textbook, e.g. Ganong, Horrobin, contains more explanation and/or more facts, and is suitable for the average student as a working textbook which he will buy. The larger textbook, e.g. Bell, Davidson & Scarborough, Best & Taylor, Davson & Eggleton and Ruch & Patton, contains many diagrams of original research work, and lists of references which in some cases, would require a lifetime for their complete assimilation. I would classify Samson Wright as one of the smaller of the large textbooks. As such, it is probably best reserved for consultation, or for the student who can cover the basic "facts" without difficulty and is particularly interested in their experimental basis. Despite the book's name, the application of physiological knowledge to the study of human disease processes comprises quite a small proportion of the book, which is mainly concerned with basic physiology.

This latest edition of a textbook dating from 1926 differs from the previous edition in having a more modern style—the pages are smaller, the book is available in soft-back form—and the traditional picture of Professor Samson Wright has been omitted. I was disappointed that the foreword consisted solely of a catalogue of changes since the previous edition, without any suggestion as to the philosophy and aims of the book. My impression is a book crammed with facts, useful for reference by the advanced student or his teacher, but making rather dull reading.Perhaps this is almost inevitable in a venerable textbook gradually brought up-to-date. W.F.M.W.

GROWTH CONTROL IN CELL CULTURES. Edited by G. E. W. Wolstenholme and Julie Knight. (A Ciba Foundation Symposium). (Pp. ix+ 275. Illustrated. £3.00) Edinburgh and London: Churchill Livingstone, 1971.

THE factors which cause cells to divide, as in wounds, to stop dividing when healing is complete, or to start dividing and failing to stop, as in the growth of tumours, are scarcely understood. Cell culture offers a means of searching for and studying these factors separately and this Ciba Symposium, from which only the initiated will get full value, shows

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that knowledge of the subject is still at a stage which can be apprehended by most readers.

It seems that cell control involves a balance between numerous functions which are of two main kinds. One sort is formed of those stimuli and responses due to the cells themselves such as cell type, cell contact and cell density, and the other comprises responses to environmental causes such as natural and artificial substrates and growth factors in animal sera. Non-specific factors such as pH may have profound effects.

Specific functions, be they cell to cell stimuli or macromolecular substances in serum, pose two principal problems. Firstly, how do cells receive the message? Secondly, how is the message put into effect?

Clearly if a growth-inhibiting macromolecule cannot be taken up because the cell has lost specific surface receptors the cell will go on growing. It is in this context that virus-transformation of cells to malignancy is a valuable part of the field of study. Alternatively, instructive macromolecules may be taken up, but the cell may have learned to ignore them or environmental effects may not allow the cell to respond to them. Such balances are the heart of the matter and much of the discussion at the symposium is concerned with the best means of detecting, isolating, and analysing processes which may, in fact, not be too numerous. The cellular characters contact inhibition, topo-inhibition, saturation density, cell division and movement, growth in semi-solid substrate are observed primarily. Surface structure, agglutinability, antigenicity and exchange of macromolecules are studied in order to explain alterations of the primary characters. Of the methods used, a combination of genetic and biochemical studies appears to be the most hopeful means of obtaining sound and useful information.

The reported discussion is, as always, a very instructive part of the symposium and a very valuable table of standard data on the cell cultures is appended. K.B.F.

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In spite of the fact that this is a third edition the text shows very few of the characteristics of a revised text. There are very few places where the information does not conform to current views (as for instance in the precise mechanism of carbohydrate absorption and the description of insulin as a protein). I had to read the text right through to find these examples and was impressed also by the clear type and illustrations and the absence of misprints.

If a further edition is planned I would suggest the following alterations:—

(a) That more detailed information be given about the way in which food can cause diseases, particularly infections. The dangers of Grade A unpasteurised milk could be emphasised and also the dangers of bulk preparation of infant and oesophageal feeds, with notes of their storage on the wards between preparation and use.

(b) Low salt diets. These are described as of use in the treatment of heart failure and cirrhosis of the liver as well as in severe renal failure. In practice the widespread adoption of powerful diuretics for the treatment of heart failure and cirrhosis with ascites has replaced the low salt diet and produced salt depletion syndromes which should be prevented by dietary supplements.

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Some of the most important health problems which confront us today such as addiction to alcohol, tobacco, cannabis or LSD, suicide and attempted suicide, gonorrhoea and many road accidents are caused by faulty patterns of behaviour. Such behaviour is now in fact more fatal in the Western World than the bacterium or virus.

Another area of human behaviour which is closely related to the health of the community lies in the realm of reproduction. A lack of responsibility in this aspect of behaviour has

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Susser and Watson's book deals with many of these problems and contrasts the health experiences of peasant and industrial populations and in different social classes.

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The chapters on population, culture and health, social class and social mobility and health (chapters 1, 2, 3, 4 and 6) will be of most interest and relevance to the medical undergraduates, but medical students and doctors alike who wish to acquire the basic knowledge in this new and developing field will find the whole book of interest. It appears to be becoming the standard work in medical sociology. J.P.

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WHY does a college need a psychiatrist? This book attempts to answer that question. It consists of a collection of articles by different authors, most of whom work in the Harvard University Health Service as psychiatrists, psychologists or counsellors.

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The first nine chapters cover general problems including apathy, suicide and drug abuse. They are easy to read, informative and offer practical suggestions for therapy. The next five are of special interest as they discuss difficulties relating to studying. For example chapter 12 gives amusing but pertinent advice on note-taking and passing examinations. The last four chapters concern the special problems of women students, graduate students, business school students and medical students.

There is a lack of knowledge about the problems of the post-adolescent in general and of students in particular. This book presents the common syndromes clearly and recognisably. The final chapter on therapy is particularly helpful; it discusses the various forms of therapy available and also gives a straight-forward account of how short-term psychotherapy is actually conducted. This could readily be understood and utilised by therpists other than psychiatrists.

Anyone working with college students will find this book interesting and its general discussions deserve a wider audience. R.E.S.J.

PHARMACOLOGY FOR MEDICAL STUDENTS by J. P. D. Graham, B.Sc., M.D., F.R.F.P.S., F.R.C.P.E., F.R.S.E. Second Edition. (Paper £1.80; Boards £2.80) London: Oxford University Press, 1971.

I find this a useful book for quick reference, it contains a wealth of information, has a good index and the facts are concisely stated. The new edition is in the same paperback format as the old and the text is laid out in two columns with a large number of text tables and diagrams. The new edition is 30 pages longer, has two extra pages of black and white photographs and is double the price of the 1966 edition. I am not sure that it is the ideal textbook for medical students for a number of reasons. It is not easy to read because of the highly compressed almost telegraphic style of writing. This makes it more suitable for revision than for primary study. It is too big (21 x 27 cm) to carry in the pocket for reference while working on the wards and its comments on treatment are often misleading.

"Treatment. Acidaemia may be treated by reducing the production of excess acid in diabetes by administration of insulin and dextrose; by promoting the excretion of fixed acids by giving excess of fluids and a diuretic; by neutralizing acidity by intravenous infusion of solutions of bicarbonate or lactate, or by increasing the excretion of carbon dioxide by stimulating breathing."

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"Treatment. Acidaemia may be treated by reducing the production of excess acid in diabetes by administration of insulin and dextrose; by promoting the excretion of fixed acids by giving excess of fluids and a diuretic; by neutralizing acidity by intravenous infusion of solutions of bicarbonate or lactate, or by increasing the excretion of carbon dioxide by stimulating breathing."

led in the U.K. to increasing numbers of unwanted pregnancies with their toll of abortion and illegitimate babies and, in some countries, to serious overpopulation.

Susser and Watson's book deals with many of these problems and contrasts the health experiences of peasant and industrial populations and in different social classes.

The second edition has been enlarged by about one third due to the addition of material from the American experience of the authors and by the addition of many informative tables and diagrams.

The chapters on population, culture and health, social class and social mobility and health (chapters 1, 2, 3, 4 and 6) will be of most interest and relevance to the medical undergraduates, but medical students and doctors alike who wish to acquire the basic knowledge in this new and developing field will find the whole book of interest. It appears to be becoming the standard work in medical sociology. J.P.

EMOTIONAL PROBLEMS OF THE STUDENT by Graham B. Blaine Jr. and Charles C. McArthur. Second Edition. (Pp. xi+388; £3.00). London Butterworths, 1971.

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THIS guide is based on recommendations of a working party set up at a conference of medical editors held in London in 1968 and should do much to reduce the existing confusion. It is stated that there are 2,632 different ways of setting out a conference. Editors will readily believe this and too often authors use half a dozen or more in one article. It is suggested that the confusion of abbreviations for the names of journals be avoided by giving the name in full. We think the value of this is over-rated, but increasingly welcome it from our contributors. Abbreviations are best avoided in a general medical journal, but, when required to avoid the repetition of long words or phrases, those given are commended to our authors. Certain usuages recommended may seem unnecessarily pedantic, but in these days when many journals employ professional copy writers the old excuse' Tis well enough spelt for a gentleman' no longer applies.

PSYCHOLOGY IN MEDICINE by J. E. Orme and F. G. Spear. (Pp.xiv+1–218). London: Bailliere Tindall, 1971.

THE medical student to-day is becoming increasingly aware of the fact that a knowledge of clinical psychology can help him in his work with patients, and the problems arising from their illness. His work with psychiatric patients helps him to focus more sharply on some of

these problems, but it is important for him to appreciate that much of what he learns is applicable to a wider field.

This book is divided into two parts. The first part provides a balanced description of the investigations that can be carried out in the fields of intelligence, brain damage, perception and personality to mention but a few of the areas covered. The second part gives a very useful account of the various psychological methods of treatment, including psychoanalytically based treatment and behaviour therapy. The psychological aspects of physical methods of treatment are described, and a helpful analysis of the psychology of groups, both large and small, is included. There is a very clear account of the concept of the therapeutic community, and reference to the sociological structure of some general hospitals. The last chapter deals with statistical methods and experimental design.

The authors have achieved their goal in writing an account that is informative, lucid and of practical value for those working in the fields of medicine, including psychiatry, and clinical psychology. J.G.G.

THE CHALLENGE: DESPAIR AND HOPE IN THE CONQUEST OF INNER SPACE by Rudolf Ekstein, Ph.D. (Pp. xii+354. £3.50). New York: Brunner/Mazel; London: Butterworth, 1971.

THIS book stems from the work of Dr. Ekstein and seven of his colleagues at the Reiss-Davis Child Study Centre in Los Angeles, California. The treatment of severely distrubed children and adolescents is described within the framework of psychoanalytic concepts. It is the reviewer's opinion that this book would be of greatest value to those who have a detailed knowledge of the psychoanalytic approach, and are fully conversant with the terminology used within that framework. It illustrates the changes in the psychoanalytic approach that have taken place over the years with particular reference to the role of the therapist in the therapeutic situation. J.G.G.

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IN the introduction to this book, it is suggested that in many ways the material included reflects attempts to examine data derived from cognitive studies of human situations rather than those based on the behaviour of laboratory animals. Dr. Macdonald Critchley, in his chapter on Development Dyslexia, as a Specific Cognitive Disorder, gives the definition of 'cognition' he intends to use and then clearly develops his theme. Other writers are concerned with, amongst other things, studies having considerable relevance for those who are responsible for the education of young children, including those who have various difficulties arising, for instance, from blindness, their position in a given social structure or ethnic group.

It is perhaps, surprising how little has been written about the cognitive development of blind children. In this book, there is an excellent contribution by Witkin and his colleagues on congenitally totally blind and those who were blind because of retinoblastoma. The illustrations of clay models made by blind children are very revealing of how they perceive people around them. This is a field in which further research could tell us much about the adaptation of the blind to the problems of psychosexual maturation.

Cognitive Defects in Schizophrenia: overinclusive thinking are described in detail by R. W. Payne. This is an excellent account of the subject. There is a thought-provoking chapter by Fowler on Cognitive Baselines in Early Childhood. Forms of competence, including those relating to survival coping under conditions of high social density and disorganisation in a difficult urban scene, are described. The importance of recognising the ways in which different forms of competence fostered by a child's background have a bearing on his educational needs is indicated. The child who is expected to function in a middle-class cognitive verbal world may be at a disadvantage and require special educational techniques to overcome his difficulties.

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These are but some of the questions raised by a series of articles by experts who have demonstrated the value of applied research.

The psychologists, the psychiatrist and the educator will find much to interst them in in this book. J.G.G.

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SOME 250 references form the basis for this book. Their contents are categorised chapter by chapter. If the reader wants, say, a list of references dealing with the size of populations forming the basis of studies of psychotherapy, he will find it on page 174. Similarly he will find techniques and interventions arranged alphabetically, with appropriate references in Chapter 6.

Studies of Outcome (Chapter 12) do not seem to include comments by Eynsenck on the efficacy of psychotherapy generally. In the reviewer's opinion, it would have been helpful had a general critique of this kind been critically reviewed.

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Goldschmidt uses the word 'Arete' to denote the qualities a person should ideally possess, according to the norms of his community. This must be known for each person if we are to understand the character of his behaviour. The youth who does not have a clear idea of himself as individual in relation to his background is quite severely handicapped.

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