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THE ULSTER MEDICAL JOURNAL

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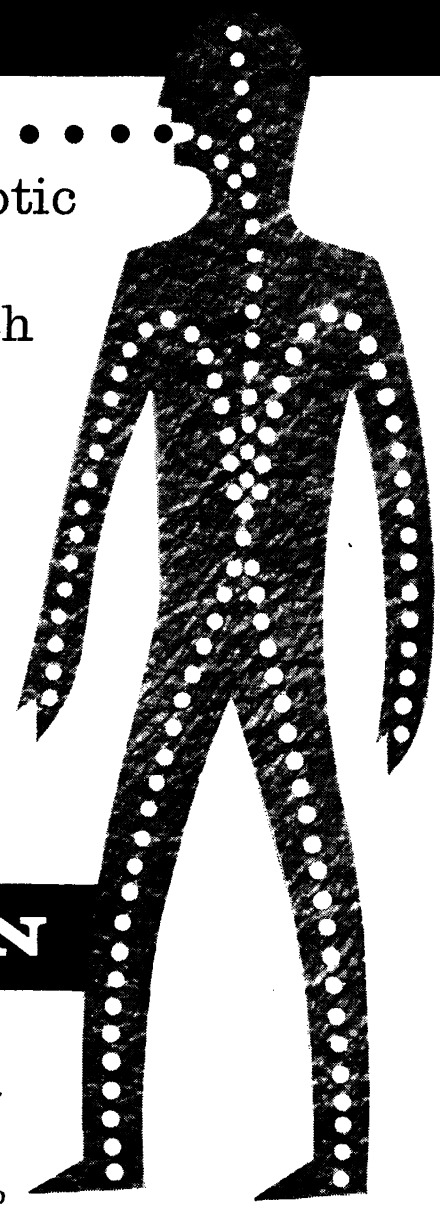

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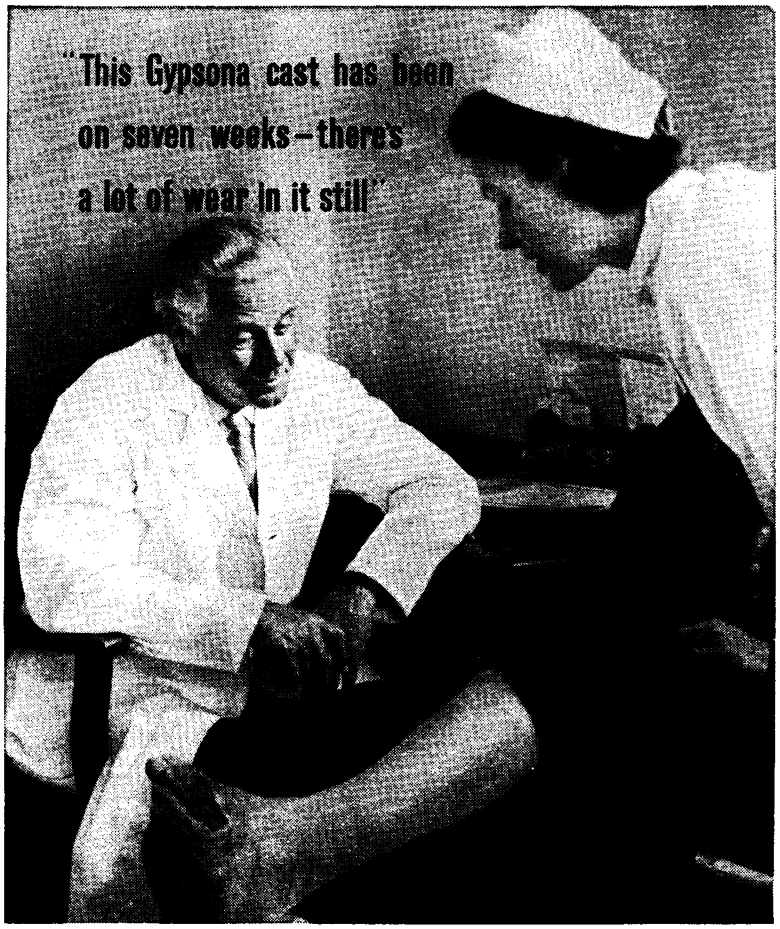

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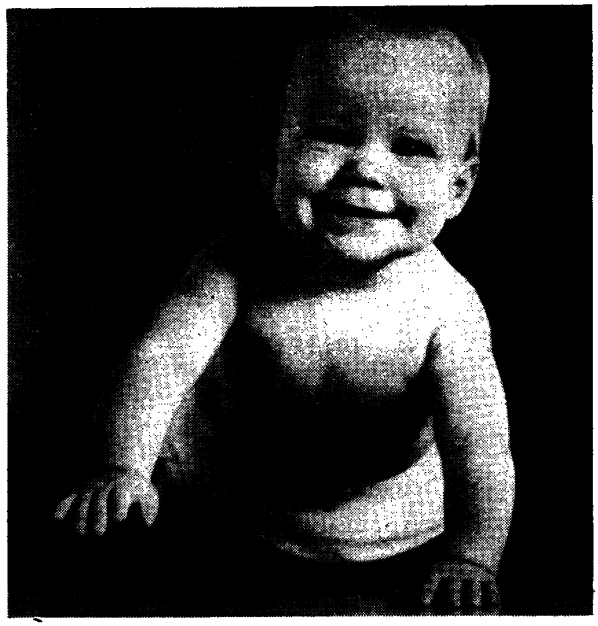

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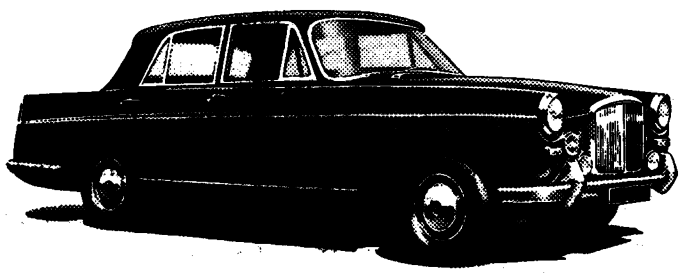

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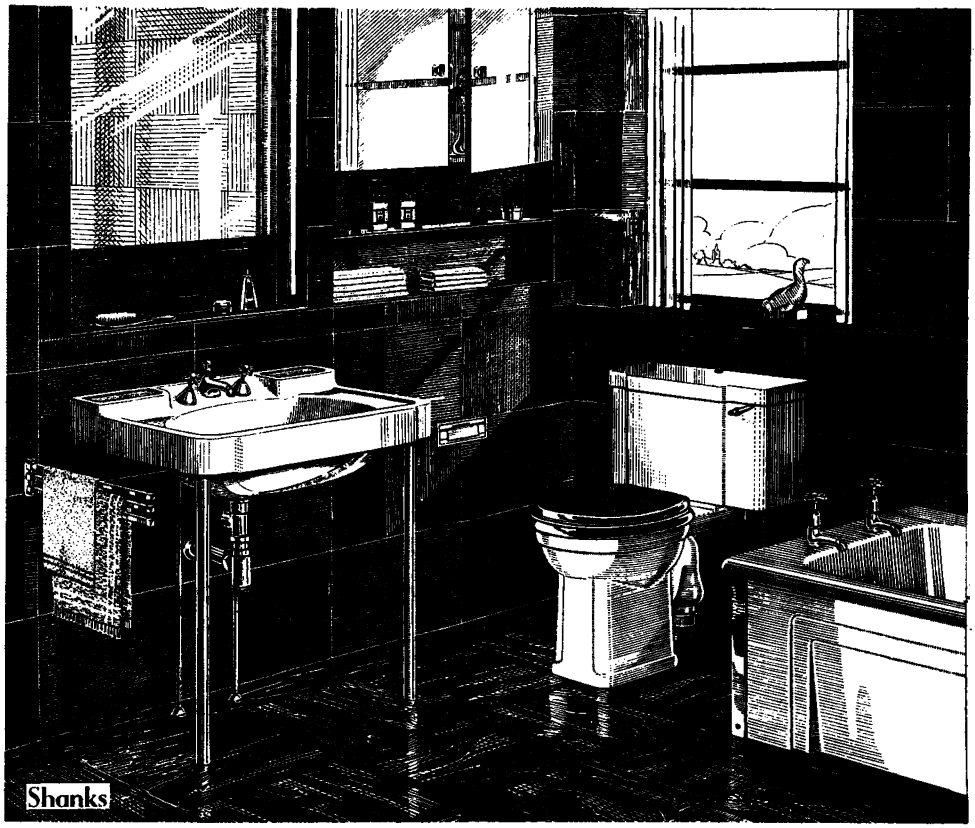

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No. 2: December, 1960

The Ulster Medical Journal

VOL. XXIX

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1960

CONTENTS

Fellows and Members of the Ulster Medical Society receive the Journal free.
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THE ULSTER MEDICAL JOURNAL

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THE
ULSTER MEDICAL JOURNAL

PUBLISHED ON BEHALF OF THE ULSTER MEDICAL SOCIETY

Vol. XXIX 1st DECEMBER, 1960 No. 2

THE MEDICAL HISTORY OF DERRY AND LONDONDERRY

By **DR. J. A. L. JOHNSTON, M.D.**

PRESIDENTIAL ADDRESS
to the Ulster Medical Society, 20th October, 1960.

I HAVE chosen as my subject for this address—The Medical History of Derry and Londonderry. My chief reason for doing this is that the present year has been something of an "annus mirabilis" in the life of that city as it has seen the opening of the new general hospital built from the ground on a new site at Altnagelvin and also the putting into service of new blocks and annexes for the care and treatment of the mentally afflicted at Gransha.

I feel that such an occasion should not go unmarked, particularly as I am a Derry man myself. I can assure you that the citizens of Derry all feel very proud of this magnificent new hospital and everybody feels highly honoured and very grateful that it should have been built in Londonderry. It would need a more eloquent tongue than mine to express fully our appreciation and thanks but I will make amends to one class of people who have never yet been thanked by name and that is the British Taxpayer who has been the "fons et origo" of the whole venture. Speaking as the senior member of the Medical Staff at Altnagelvin Hospital, I can answer for the loyalty and efficiency of all its officers, and I feel that by their enthusiasm this hospital has been most successfully launched on its destined career, and let us pray that this will be a long and distinguished one in the service of the community.

Just in passing it is worth recording that by an odd coincidence St. Columb's Cathedral was the first to be built in the British Isles after the Reformation and Altnagelvin is the first major hospital to be built since the passing of the National Health Act in 1947.

I think the medical history of Londonderry falls naturally into four well-defined chapters, viz.:

(1) Early history leading up to the Siege (A.D. 1688-89).
(2) From A.D. 1700 to the Great Famine of A.D. 1846 to 1850.
(3) From A.D. 1860 to 1900.
(4) The present century.

Dealing first of all with the early history of Derry, as it then was called. Geography teaches us that the site of a town is, to a large extent, pre-determined by the physical features of the countryside in which, sooner or later, it comes into being. Thus with Derry situated as it is, as the nodal point of several valleys stretching far into a hinterland to the North, South, East, and West of the town, and on the banks of a broad and navigable river down to the sea, which makes it also of great strategic importance from a military point of view. It is due to these factors that most, not only of the triumphs, but also the trials and tribulations of the town came about. The rôle that Derry played in the last war has not, for security reasons, even yet been fully delineated but as the furthest West guardian of the Western Approaches it was most important.

Derry makes its bow to recorded history in the year A.D. 546, that is over 1,400 years ago, but long before that, for the reasons mentioned above, there must have been some sort of settlement on the same site. However, in the year A.D. 546 St. Columb came and founded a monastery in Derry. It can be presumed that once this monastery was established there would be some sort of medical service for the community at large. After all these monks had some degree of education and many of them, surprising as it may seem, were much travelled men going on pilgrimages and so forth. It was the custom in other such communities for the monks and nuns to do what little they could to alleviate sickness and distress and under such an enlightened leader as St. Columb was, you may be sure that there was a succession of Brother St. Lukes to carry on the tradition. There was no hospital, however. Princess Macha of the Golden Locks has stolen the headlines in that respect. So far as one can gather this lady was no saint but nevertheless it seems to be well authenticated that she did actually found a hospital, the first in Ireland, for the treatment of the sick and wounded and it was a very nice gesture on the part of whoever thought up the idea to have her name perpetuated in bronze at the first of the new hospitals to be built in Northern Ireland at Londonderry. In the story that the statue tells, tribute must also be paid to the sculptor for conceiving the idea of putting a dove perched on the left forearm of the figure which surely must symbolise St. Columb himself, who is known as the "Dove of the Church," by reason of his missionary zeal and prowess. Having established his monastery in Derry in A.D. 546 he sailed to Iona with twelve disciples in the year A.D. 563 for the purpose of "preaching Christianity to the northern Picts, who were still in a state of paganism and for the better instruction of his countrymen who were settled in Argyle and other adjacent tracts."

It is a long, long cry from A.D. 546 to 1960, more than fourteen centuries in fact since Derry first came on the map, and whilst it was never a large town nevertheless by virtue of its history it has a claim to greatness and I have found it to be a most fascinating task going into its history. Being a centre of strategic importance has not been an unmixed blessing and down through the centuries this is evidenced by the number of times the town was burned and looted by raiding Danes and Norsemen by whom Ireland was first infested in A.D. 795. All of these seem to have been plundering raids and no attempt seems to have

been made to gain more than a temporary foothold in this part of Ireland, as they did around Dublin.

From about A.D. 1150 onwards a different sort of invader came to Ireland, an invader that intended to stay and in fact did stay, and with the help of their English compatriots have stayed ever since. First of all there were the Norman knights and their men at arms in isolated forays, but by A.D. 1300 there were several settlements in Ulster and in fact all over Ireland. To this day there are streets in Derry named after the De Burghs, the De Moleyns and the De Courcys. By Tudor times in the early part of the sixteenth century the whole of Ireland was held in a fitful and uneasy state of suzerainty to the English Crown. The rebellion of Shane O'Neill—the Earl of Tyrone—gave the first occasion for the presence of an English garrison in Derry in A.D. 1566, but this remained for only a few years. This project was not forgotten by Queen Elizabeth the First and her government, and the failure of the Earl of Essex to hold the town was one of the chief articles of complaint in his indictment. "How often," writes the Queen to him, "have you resolved us that until Lough Foyle and Ballyshannon were planted there could be no hope of doing service against the capital rebels."

Eventually an expeditionary force was organized and the very first mention of a hospital is contained in a manuscript entitled "A narration of the Services done by the Army employed to Lough Foyle under the leading of me, Sir Henry Docwra, Knight," etc. In reciting the stores given to him he goes on, "The provisions wee carried with us at first were a quantitie of deal boards and spars of firr timber, a 100 flock beds with other necessaries to furnish an hospitall withall." After giving an account of his stewardship in other directions he states that "he did as he was tould" (sic "*tould*"). So speaks this honest old Elizabethan soldier. Incidentally this is a good example of the persistence throughout Ulster of the Elizabethan manner of speech. This sort of pronunciation is still common tongue and anybody wishing to knock it out of their children have to begin at a precious early age in their lives to make a success of it.

There is a map dated A.D. 1600 showing the site of this hospital. It was outside the ramparts of the town and, judging by its position, probably was some sort of an isolation hospital because by that time the English settlers were familiar with various epidemics of plague and so on.

The life of this hospital was short because in A.D. 1607 it shared the fate of the rest of Derry in being razed and burned to the ground by Sir Cahir O'Doherty in his revolt against the Crown. This act of vengeance led to the confiscation of vast areas of land in Ulster and eventually the Plantation by English and Scottish settlers in the reign of James the First. In A.D. 1609 an agreement between the Lords of the Privy Council and the Corporation of London set up the Honourable the Irish Society and shortly afterwards it received the first charter of the City of Londonderry as it was thence afterwards named. One of their first concerns was to look to the defences of the new town they proposed to build and the gentleman who was asked to make a survey rejoiced in the name of Sir Basil Brooke, a direct ancestor of our present Prime Minister who was also Sir Basil Brooke. Eventually the walls were built at a cost of £8,357, and they are still

there. Another name that must be mentioned is that of Matthias Springham, who was sent by the Irish Society as a sort of civil administrator but who is remembered more by the fact that he founded the Free School, later to become Foyle College.

During the whole of the seventeenth century England and the whole of Europe were ablaze with religious and dynastic wars. Ireland did not escape the general upheaval and during this time Londonderry survived no less than three sieges and was never taken, thus earning the title of the Maiden City. So far as medical history is concerned the only constructive step taken seems to have been the establishment of dispensaries by the Irish Society.

Any account of the medical history of Londonderry must take notice of the famous siege of 1689. The political or military history of this does not concern us, but just to keep the record straight those inside the walls were the Williamites and those outside the Jacobites. The only thing that does concern me is to give a very brief account of the sufferings of the besieged.

The main source of trouble was of course the overcrowding of the city by civilian refugees from all over the Province. Remember the walls were rather less than one mile in circumference and into this very limited space some 25,000 to 30,000 people were crammed in somehow or other, but of this number only some 8,000 souls survived. By any standards of human conflict that was a frightful holocaust—only one person in three surviving.

The greatest trial of course was starvation and as a sequel to starvation pestilences of all kinds. The siege lasted for 105 days—that is to say the close investment of the town. There is no doubt that in the early days of the siege sufficient care was not taken to husband the resources of the commissariat but as week after week passed and the expectations of early relief faded away a strict rationing system was adopted and as time went on this became progressively more restricted. This must have been particularly galling as during July the citizens could see the relieving ships in Lough Foyle. In the interests of defence an attempt was made to allow the garrison troops a slightly better ration than that given to the civilians but by the first week of July, with the siege still four weeks to run, this was down to 1 pound of tallow and 2 ounces of meal per day. By the middle of June the civilian population were brought to the extremity of feeding upon anything they could lay their hands on such as horses that had died of starvation and even rats and mice, all of which had their price. There are many harrowing accounts extant of the sufferings of the besieged but time will only allow me to give one quotation. It is from the pen of one John Hunter of Maghera and reads, "I could not get a drink of clear water and suffered heavily from thirst and was so distressed by hunger that I could have eaten any vermin but could not get it. Yea there was nothing that was any kind of flesh or food that I would not have eaten if I had it. The famine was so great that many a man, woman and child died from want of food alone leaving aside the scores of hundreds that died from the plagues and pestilences that ravaged the city." Holmes, one of the chroniclers of the siege, asserts that no child survived the siege at all.

How was all this vast emergency dealt with medically? The answer is that it was not dealt with at all. I have read scores of documents relating to the siege and can only find the names of three doctors, viz., Dr. Joseph Aicken, Dr. Herman and a Mr. Alexander Lindsay, and the latter was killed by a bomb in the streets attending the wounded and that was quite early on in the siege.

It is not to be wondered at perhaps that medical men were so thin on the ground so to speak. There may have been and probably were some apothecaries of various degrees of skill and knowledge and even the so-called Chirurgeon Lindsay, who was killed, may have belonged to this group but they could not have been more than a few. It must be remembered that the renaissance of medicine was only just taking place. William Harvey died in 1657, Thomas Sydenham in 1689, the year of the siege, Malphigi died in 1694, and Von Leewenbock, the inventor of the microscope, in 1724. All the great discoveries made by these men had to come before anything could be done in establishing medicine on a scientific basis and goodness knows that was slow enough in coming. The "School of Physick" in Trinity did not begin until circa A.D. 1720 and the School of Medicine in Queen's University of Belfast was fated to gestate in the womb of time for a further century and a half or thereabouts.

Before leaving the siege it is worth recording that after it the city was uninhabitable for fully three years. After the bombardment the town had practically to be rebuilt and not only that but because of the corpses, which kept on being dug out of the cellars and yards, the stench of putrefaction was terrible in the extreme. Also there was a terrific plague of rats and sporadic epidemics of typhus fever kept adding fuel to the fire, because in the absence of any public health service the dead were left to bury the dead.

By the year A.D. 1700 things in general had become settled. The wars were over, the city had been rebuilt and trade began to recover. Gradually it became apparent that some sort of institutional treatment was necessary for the nursing of the sick and the care of the mentally afflicted. Now, interesting as it may be to trace the origins of hospitals and so on, I think it is necessary to reorientate our minds with regard to the function of such hospitals. They were really only for the very poor and destitute people of the community and being such as they were nobody decent, so to speak, would go into them; such people were nursed in their homes. However, everything has to have a beginning and so far as can be ascertained sometime about 1710 a Poor House and Infirmary was established on a site inside the walls where later there was a vegetable market and now a cinema. By 1750 this establishment had been gradually growing and in 1769 the sum of £150 was voted for its use by Parliament. In April, 1790, there were 114 distressed people supported in it.

Now there comes on the scene a certain Wm. Patterson, M.D., who seems by all accounts to have been a man of erudition and character. He was born in Ramelton and came to practice in Derry in 1774. It was through the unwearied exertions of this man that the first stone of the new Infirmary was laid in 1791 and he was appointed its first surgeon. Dr. Patterson wrote quite extensively

and submitted several treatises to the Royal Irish Academy, of which he was a member.

This building was found to be inadequate and it was decided to make a change and seek pastures new. The dispensary was hived off and the Infirmary rebuilt on the site of the present City and County Hospital in 1810, that is 150 years ago, at a cost of £9,104. 5s. 11d. There is a slight but rather significant difference between this and the £2½ million for Altnagelvin.

The management of the financial part of this venture is rather interesting. A fund was started in 1799 and from 1804 onwards levies were made off the City and the County of Londonderry at either the Lent or Summer Assizes amounting to about £1,400 per annum. As for the upkeep, the surgeon's yearly salary was £92. 6s. 1½d. and the Matron £14 per annum. The steward or secretary got £30 per annum. Nurses were paid £6 each per year, only 8s. more than that paid to female house servants at £5. 12s. each. The annual expenditure for medical and nursing staff amounted to £263. 16s. 1½d.

Income was received from a variety of sources, the principal being levies by the Grand Jury already referred to and also Parliamentary grants usually of £100 per annum. Then there were subscriptions and donations amounting to about £250 per year on the average. A very interesting source was fines on potheen stills at Petty Sessions courts. The best year for this was 1816 when these fines amounted to some £394. 10s. and the worst only £16. 3s. 6d. in 1831. The total income on the average was £1,000 and the expenditure the same. Any deficit was made up at the next Assizes. The average annual bill for medicines was about £60 and for provisions about £500 per annum. In 1835 some 470 patients were admitted, of which 315 were discharged cured and some 21 died—not bad figures at all.

There are lots of interesting old documents relating to this old hospital but time forbids mentioning them in detail. One, however, I will mention. This is a return of some sort with a classification of the diseases dealt with during the year and one is surprised at the up-to-date look it has. There were two conditions mentioned, however, which quite defeated me for a long time. One was designated "Sibbens" and the other "Cynanche." The first, Sibbens, was a disease formerly endemic in the Scottish Highlands and resembled Yaws. The other, Cynanche, was a disease affecting the upper respiratory tract and later on was very prevalent during the famine.

I am pleased to record that from the beginning, under the guidance of a Dr. Rogan, a good job of work appears to have been done. In 1827 a report addressed to the Marquis Wellesley the Lord Lieutenant of Ireland about this hospital by Elizabeth Fry and Joseph Gurney states that in point of cleanliness, comfort, and good order this Infirmary is the one which of all others in Ireland they would "mark as excellent."

This old institution, perhaps the oldest in the Province, added lustre to its fame during the 150 years of its existence on its present site and then, like the old soldier, it did not die but simply faded away across the river that has seen so much history, to Altnagelvin during February of this year of grace, A.D. 1960.

I for one, and I speak for many others, will always have a soft spot in my heart for the old "City and County," having been on its staff for thirty-three years.

Coming now to the care and treatment of the insane, which has been such a problem down through the ages. During the decade from 1820 to 1830 three asylums were built in the Province of Ulster, one in Belfast, one in Armagh, and one in Londonderry. The Derry house cost £25,678. 2s. 4d. The odd shillings and pence in these old bills of costs always amuse and fascinate me and I like quoting them in full. Right from the beginning this institution got off to a good start and seems always to have been fortunate in its Medical Superintendents, the first of which was a Dr. P. R. White. It invariably got a first-class report from the various inspectors who always seem to have taken their duties very seriously indeed. One such report in 1834 caught my eye particularly. "This asylum," it states, "maintains its rank amongst those already established in Ireland, for neatness, good order and economy, and manifests the success that invariably follows wise and humane treatment. Nothing could be more satisfactory than the inspection of the Londonderry Lunatic Asylum." Then comes a sentence which made me think that some of the recommendations we hear nowadays are perhaps not so much up to date as their authors imagine. Touching upon the shortage of accommodation, the report goes on: "The number of incurable cases remaining in the institution is an evil it would be very desirable to get rid of as they occupy the room and prevent the admission of recent cases where most hope exists of recovery; and thus should the malady be on the increase, would finally close these asylums against the curable cases. The intelligent medical officer of this institution in Derry suggests that a provincial asylum should be erected for incurables only and states the vast numbers still unprovided for as an unanswerable reason." The number of beds available at that time in the Derry House amounted to 190 and it was estimated there was need for 800 and that if nothing was done it meant that numbers of people who were not criminals would remain to languish in gaols.

During the eighteen-forties the Poor Law Workhouses and Infirmaries were built throughout Ireland. The history of these places is somewhat sordid, a few were fairly good, a lot were very indifferent but most of them were rank bad.

The dominant feature of the health of the community during the first half of the nineteenth century was yearly epidemics of one sort and another. Derry had its fair share of these. In 1832, for instance, there was an epidemic of Cholera Morbus claiming almost a thousand victims with two hundred deaths.

The year A.D. 1800 marks a turning point in Irish history. In 1801 the Act of Union was passed through the Parliaments both at Westminster and College Green in Dublin. The era of British suzerainty was over and now it became the United Kingdom of Great Britain and Ireland. Unfortunately although promised as a stimultaneous measure an Act of Emancipation was not put on the Statute Book until 1823. During those 23 years seeds of frustration and hostility were sown which grew like rape and it cannot be gainsaid, militated against the harmonious development which the protagonists of the Act of Union, on both

sides of the Irish Sea, envisaged. The ashes of the '98 rebellion smouldered on and leapt into active flame from time to time with the results we all deplore.

This is only, however, an historical landmark in my account of the Medical History of Londonderry and the only bearing it has on the medical history of the town is that, in common with the rest of Ireland, more money began to be made available for the building of infirmaries, hospitals, and asylums. During the first 45 years of the century we have seen the establishment of the Derry Infirmary, the Derry Asylum and the Union Workhouse and Infirmary. During these 45 years these three institutions seemed to cope adequately enough with what came their way but it must be remembered that they only had to deal, as I have pointed out previously, with the lower strata of society. What then of the general practitioners of the town? I have not been able to uncover the names of any doctors or apothecaries practising in the city during this time but in Colbys Ordnance Survey I came across a list of medical periodical publications which were in 1834 distributed throughout the town. There were seven people taking the Lancet, nine Johnson's Medical Journal, seven the Dublin Medical Journal and four the Edinburgh Medical Journal, so there must have been some doctors taking an interest in their work. Also, quite by accident, I came across a copy of an old Almanack printed in Dublin in 1823 and, browsing through the pages of this, I found a list of the Fellows and Members of the Royal College of Surgeons in Ireland. One of the names was that of a Sir John Magennis, M.D., of Londonderry. There was an asterisk in front of his name. Looking up what this meant I found, as might be expected, that he was an obstetrician and gynæcologist.

I feel I must make a digression here. It does not concern Londonderry directly but I am certain it will please a lot of my listeners. By 1820 the population of Belfast was beginning to overhaul that of Derry—then of about 20,000 inhabitants each. The year 1815 saw the commencements of Frederick Street Hospital which was later to become so famous. Almost from the start of Frederick Street attempts were made to establish a Medical School. At first these were abortive but eventually in 1845 became an accomplished fact by the establishment of the Queen's College of Belfast. It is gratifying to realise that the first medical school to become established in the Province was opened in Belfast under the ægis of the Royal Belfast Academical Institution. Surely that is something to be proud of. I have never heard of any other school being the foster-parent of a Faculty of Medicine and it was to this Faculty which Queen's owed its first Professor of Midwifery, none other than the Dr. Wm. Burden, whose ghost had such an instructive walk with Professor Macafee not so long ago.

We come now to the greatest disaster that ever befell Ireland as a whole and from the effects of which she has not even yet fully recovered. The great Irish Famine started in A.D. 1845 and raged for three long desperate years until 1848, and remember that is only a little more than one hundred years ago. From one cause and another the population was reduced from eight million plus to four million minus. Under the strain of this catastrophe the hospital administration,

such as it was, broke down completely. Even the gaols were full of dead and dying.

By 1843 the Poor Law Workhouses and Infirmaries had come into being, but as such they were only meant to deal with the chronic sick of the lower classes, the blind and the destitute people. Generally speaking, those who could not look after themselves and had nobody to look after them even in the most primitive manner. Private charities had done a great deal to alleviate distress amongst poor working people but there was still a large mass of penniless and destitute people just able to exist above the starvation line and no more, who were forced to seek relief. The conditions obtaining in these Poor Law Infirmaries were very primitive indeed. There was no nursing worth talking about and medical supervision was of the very sketchiest type.

The Derry House, as it came to be called, was no worse than any of the others; in fact it was better than most, but yet just as woefully inadequate as them all, and it broke down completely under the stresses and strains that were to come during that decade. By 1846 the first signs of serious trouble began to be manifest. Cases of typhus fever, relapsing fever, and all the rest of them began to pour in, in ever-increasing numbers. Nothing really was done or could be done for these unfortunate victims; they either died or got better and over 50 per cent. did die. Expedients such as temporary fever hospitals were employed but they were little better than open sheds and the conditions were truly appalling.

So far as Ulster was concerned actual famine conditions did not prevail in what are now the Six Counties of Northern Ireland, although there were black spots in the counties of Derry, Tyrone, Fermanagh, and North Antrim. Donegal, however, was one of the hardest hit areas in all Ireland and large areas of Monaghan and Cavan were not far behind.

In Derry, and the same remark applies to Belfast and other towns, the trouble was mainly what is called nowadays a refugee problem. The figures show that Derry bore the brunt of it due to its proximity to Donegal. The actual number of cases dealt with was about the same in Derry and Belfast, but Belfast being by this time twice the size of Derry had the better accommodation and, above all, the advantage of having two or three really outstanding physicians in their time and generation. One of these, a Dr. William Reid, was afterwards looked upon as one of the leading authorities on famine diseases. In both towns of course there were many cases of typhus fever, etc. This was not due to famine and starvation but simply to ignorance of the mode of the spread of the diseases through infestation by lice. It took another sixty years before that fact was fully established and even then there were those that doubted its truth.

I have the advantage of having heard an eye-witness's account of these dreadful times. My grandfather died in 1915 at the ripe old age of 96, which means that he was born only three years after the Battle of Waterloo and was thus in his thirties when the Famine was at its worst. Some of his stories would have made the hair stand on your head. These were usually provoked when he saw some-

body throwing away a crust of bread. One incident he related has always stuck in my memory. It referred to a journey he made in Donegal when in six miles he counted over thirty corpses by the wayside. There was not one single inhabited cottage, nor cow or sheep or ass to be seen; nothing but rats and you can imagine what their food was. A scene of utter desolation in a beautiful countryside.

Many causes have been assigned in the bringing about of this disaster but the ostensible reason was the failure for three years running of the potato crop due to a fungus disease known as the blight and potatoes were the staple diet of millions of people. This can be controlled by a solution of copper sulphate. This discovery was made by a Professor Millardet of Bordeaux, but it took forty years before it was anything like generally put into use. Incidentally this present year was a bad one for blight even with spraying.

The memory of the Famine lingers on to the present day and this is not to be wondered at because whole families were wiped out in the worst affected districts. Also there were sporadic outbreaks of the Famine fevers, particularly typhus, right up to the present century. The stained glass window in the library of this very building commemorates the heroism of Dr. Smith in dealing with a serious outbreak in Arranmore Island off the west coast of Donegal in which he himself lost his life as did his successor. I myself had a case in Derry as late as 1941, but this was something out of the ordinary as the vector was a cat picked up from a raft in the Atlantic at the sinking of the "Bismark" and landed in Londonderry by one of the destroyers taking part in the action. The case was a typical textbook case and she recovered.

Looking back on it, it is easy to see that having a few inadequately equipped and understaffed hospitals and infirmaries was not enough; something else was needed but that something else was very slow of coming along. During the seventeenth, eighteenth, and nineteenth centuries all sorts of discoveries had been made but they were made in isolation and were not put into use for years and years, because of stupid ignorant prejudices and jealousies. When this could happen amongst the colleagues of those who made the discoveries what chance was there of lay understanding. Think of what happened to Lister and Simpson and their attempts at reforms in their own spheres of clinical surgery and medicine, and that was late on in the nineteenth century. Is there any wonder at the passionate appeal made by William Harvey when he announced his great discovery of the circulation of the blood at his Lumleian lecture in 1616. After recapitulating the steps by which he had come to his conclusions he reached the dramatic moment in his lecture, so dramatic that his exact words must be quoted—"But what remains to be said upon the quantity and source of the blood which passes is of a character so novel and unheard of that I not only fear injury to myself from the envy of a few, but I tremble lest I have mankind at large for my enemies, so much doth wont and custom become second nature. Doctrine once sown strikes deeply its root and respect for authority influences all men. Still the die is cast and my trust is in my love of truth and in the candour of cultivated minds."

The first "something else" I referred to was public health and the second

"something else" was nursing. Both came about the same time during the second half of the nineteenth century.

The Public Health Act was passed in 1875 and I need not dilate upon its provisions. Suffice it to say that it represented the title deeds of a new partnership between medical men and the state, a partnership which inaugurated a new era in the history of preventive medicine and I suppose led on inevitably and inexorably to the National Health Act of 1948.

Anyone visiting a modern hospital would say that nurses were a "sine qua non" and how right they are. Good nursing is of primary importance both to the doctor and the patient and yet it is a surprising fact that there were no nurses of the type we now know before 1850. Prior to that there was, of course, always nursing of some sort but the efficiency of these depended very largely on the personality of the persons concerned. Some were quite good, some were perfectly awful, but I should think the general average was poor; certainly according to modern standards. The exposures of Florence Nightingale during the Crimean War did much to focus attention upon the paucity of the nursing services and eventually the whole thing was put on a proper basis. So far as the Derry Infirmary was concerned it was not until 1869 that the first properly trained and registered nurse was installed—she was a pupil of Florence Nightingale herself.

No medical history of Londonderry would be complete without mention being made of its one and only specialist hospital dealing solely with ophthalmic diseases and later, of course, ear, nose, and throat cases. A Dr. Donaldson and a Dr. Hunter were the moving spirits in this adventure. A hospital was built in Bridge Street in 1894, later transferred to more commodious premises in the Northland Road, well known as the Eye, Ear, Nose and Throat Hospital, and now part of the new hospital at Altnagelvin.

Coming to the present century, 1900 marks the beginning of the vast acceleration which has since taken place. Seeds sown during the second medical renaissance now began to bear fruit. Pride of place so far as provincial districts are concerned must, I think, be given to a remarkable generation of county and districts surgeons which held sway right up to the advent of the National Health Service, that is through a span of fifty years or so. There was Tait of Downpatrick, Thompson of Omagh, Kidd of Enniskillen, to mention only a few, but all of them did a great service and exerted a great influence, not only in surgical practice but also in medicine, gynæcology, and obstetrics. They were all men of strong character and were rugged individualists. The Derry representative of this school was Galway Cooke, a most erudite and practical man who by sheer grit and determination overcame a most crippling physical disability and carried out his work with the greatest skill. He pretended to be very fierce, but in reality he was a most lovable man and a great gentleman. Some of these men were succeeded by others equally able such as Robb, Eaton, Alexander, Fleming, and Deans, again to mention a few, and I am glad to say some are still with us.

In other directions also a "new look" became apparent, not so much in the realms of pure medicine for the moment, but in such things as treatment of fever diseases. The latter indeed was quite a problem. In the nineties there were

several severe epidemics of diphtheria with a high rate of morality. However, anti-diphtheritic serum was to change all that.

The late Dr. William Rankin of Newtowncunningham used to tell a very good story about all this. At the height of one of these epidemics word went round that a supply of the new serum would be forthcoming and that all the doctors concerned were to assemble on Derry Quay on a certain date to await its arrival from Glasgow. All the doctors were there with their gigs and traps, their best ponies between the shafts and their carriage lamps all winking in the dusk. It must have been quite an exhilarating sight—much more romantic than a score or so of Austins, Fords, and Morrises. Each doctor had his list ready and before midnight each suffering child had had its first dose of anti-serum. Then in his narrative there was always a dramatic pause. He would say, "gentlemen," then another pregnant pause, and finally, "Do you know that in one week the mortality rate was reduced by half and in another week to nothing at all."

In the early part of the present century there were two or three serious epidemics of typhoid fever and a particularly severe epidemic of diphtheria in 1941 which strained the existing accommodation to the utmost. The mortality rate kept creeping up and it became obvious that in certain cases the anti-serum treatment was breaking down. However, that was the last epidemic. Nowadays, thanks to prophylactic treatment, a case of diphtheria is a rarity. The last serious epidemic was poliomyelitis in 1954. Some 112 cases were admitted to the Fever Hospital. The pattern of mortality rate, etc., was much the same as in other countries. Perhaps we were lucky to have escaped so lightly, but it is a horrible disease to have to deal with, in whatever degree it occurs. Here again phophylaxis seems to have saved the day.

During the last war hospitals were set up in Derry both by the Royal Navy and the United States Navy to treat their own personnel but the City and County Hospital had to deal with several hundred merchant seamen of all nationalities who were casualties in the Battle of the Atlantic. When the war was over the Tuberculosis Authority took over the Royal Naval establishment and it became and still is known as St. Columb's Hospital for Chest Diseases and has carried out a most valuable service to the community.

It has been a most interesting experience to have witnessed the growth of the hospital services during the past thirty years, the demand for such always seeming to far outstrip the supply. The reason for this, to a very large extent, has been an economic one and has been greatly hastened by inflation. At first hospital services were only provided for the lower social strata but now all classes have to be catered for simply because with rising costs many forms of treatment are far beyond the means of quite wealthy people and in order to make them available to every person, rich and poor alike, it was inevitable that such could only be provided by the State itself, as the only corporate body with the necessary financial resources. It is extremely doubtful, even had there not been a second world war, that the old "pay your way" system could have been sustained, but most certainly the second world war put paid to it; hence the National Health Service and all that it implies.

Turning now to the hospitals themselves. At the present moment Altnagelvin stands as the most modern general hospital with perhaps the best amenities in the British Isles, but remember Altnagelvin cost nearly three million pounds to build and equip. There are a few places like Belfast lucky enough to have a hospital such as the Royal Victoria, but remember the Royal is a comparatively modern structure and has been kept well up to date. Just look around the hospitals in the towns and cities of Great Britain, even in London itself, and you will find that for the most part they are old, semi-derelict buildings constructed mostly when British architecture had reached its lowest nádir. They have been renovated and restored with the greatest ingenuity and resource but there is a limit to all this and in many instances this limit has been reached and further expenditure would be uneconomic. This brings me back to my original point—what community, even of two or three million souls, could afford between 2½ and 3 million pounds, the price of Altnagelvin, without adding a crippling burden on their rates?

Now back to Londonderry again in conclusion. In 1938 the Board of Governors of the City and County Hospital, becoming more and more aware of the inadequacies of their hospital to meet the demands of the city and district it served, decided after anxious deliberation to build an obstetric wing and certain other additions, including a new surgical theatre and a children's ward. In 1939, by one means or another, some £45,000 was collected, but then came the war and that was that. During the war the position with regard to the City and County Hospital got worse and worse. However, the money was kept intact, and at the very first meeting of the Board of Governors after the war it was decided to put their original resolve into effect. The £45,000 was in hard cash and it was hoped to get sufficient credit to raise £100,000 or so in order to get going with their plans. Mr. Grant, the then reigning Minister of Health, received a deputation most sympathetically and you can judge of their surprise and delight when Mr. Grant announced that the Government in fact envisaged the building of a completely new General Hospital in Londonderry. That decision was taken in 1945 and the result was Altnagelvin in 1960.

It would be wearisome to attempt to go into any detail of the ups and downs attending the construction but it was worth it all and we were all very proud and happy when the first patient was admitted on 1st February, 1960. There was no flag waving or ceremonial. One day we were all working in the City and County and the next we were all working at Altnagelvin.

To end on a personal note. I have enjoyed my innings in Derry very much indeed. It has all been most interesting and if I had my life to live over again I would do the same thing again. When I set up practice in Londonderry in 1927 there were only four of us engaged in a specialist or consultant practice. Now there are twenty-four all told, including psychiatry. Each of them is busier now than I was for many a long day after I started, so where it is all going to lead I just don't know, but let us hope and pray that we do not revert to the pre-Listerian days of Hospital Fever.

WHITHER MEDICINE

THE OPENING ADDRESS

to the Medical Students in the Royal Victoria Hospital

By PROFESSOR HAROLD RODGERS

Professor of Surgery in the Queen's University of Belfast

THE title of this talk is "Whither Medicine," which means of course that, at any rate for part of this address, I intend to try and examine the changes that may come about in our profession, and more still those changes which we should try to produce. The future does not just happen; it is made by our own efforts, or lack of them, now in the present; and what we do now depends on what has gone before, what we believe, what we have learnt, and what experiences we have had.

MEDICAL EDUCATION.

Let us start these conjectures of the future with a look at medical education. You, of course, are seeing it at very close quarters at present. Although this is called the Opening Address, at which I am supposed to welcome you to the clinical part of the Medical School, most of you have already been here for several months and have had a very fair sample of the teaching of clinical medicine. So you will be able to criticize, at first hand, what I am going to tell you. Your judgment will mature as the years bring your education into perspective.

I do not, of course, mean to say that you must not criticize now. It would be quite useless even if I did say so. I am sure you will agree that the most important thing in medical education, as in any education, is that you, the student, must do the learning. You must read the books, and especially in clinical medicine you must see the phenomena of disease and try to understand them, at the bedside, in the X-ray Department, in the Department of Pathology, or anywhere else where you meet them. It is your own initiative; and your own keenness; and your own energy which will bring you to the intellectual and geographical point at which you can learn, rather than any passive absorption of teaching from others. Your teachers, as it were, can take the horse to the water but it is you that have to do the drinking. And I am sure you will find, if you have not already done so, that very often you have to find water for yourselves. Indeed I think some of the thrills in the learning of medicine is the finding out of things for yourself and later on reading in the textbooks that somebody else before you has found the same thing and agrees with you.

Now in any conclave and committee of medical teachers, and there are lots of them, you will often hear that we must teach the student basic principles and we must teach the students how to learn. I do not think I have yet met a medical teacher who does not believe that that is what he does—teaching the student how to learn and teaching him general principles. You cannot, of course, learn the

broad principles until you have acquired a knowledge of sufficient details to see how these principles work out. Take an example from botany. You cannot understand the broad classification of plants and flowers until you have seen a sufficient number of examples to see that there is some thread of continuity or of inter-connection running between them. It is necessary, therefore, for you to learn both facts and principles but use the principles as soon as you can discover them, to put the facts away in the filing systems in your mind, each in its appropriate place. Keep in mind the great framework of the science or department of knowledge in which you are working. It is a thrilling experience to make an observation yourself and then realise that it fits in with the wider scheme of things. (It is an even greater thrill to forecast what you are going to find from your knowledge of other similar phenomena. Especially if you can prevent something nasty happening.)

Discipline.

There is another thing that you will have to learn yourself and that is self-discipline: that, you cannot be taught by any teacher. You can have discipline imposed on you, and rules and regulations that you have to obey, suffer, or dodge. But that is not the most important thing for you to learn in the Medical School.

There is much debate whether students should be made to attend lectures compulsorily, or not. Some people believe that attendance at every lecture should be voluntary. As with the operation of a free economy a lack of demand will dry up the supply. That argument has a lot to commend it. But putting my mind back to the time I was a student, I felt that the compulsory attendance at some courses of lectures was a good thing. Public appeal was not always a good guide. While the majority of lectures, I think, should probably be voluntary, there are some like the Combined Course we run here which should be an integrated course at which all students attend.

Teaching the Teachers.

If you become a kindergarten schoolteacher you would go through a long course of training in the technique of imparting knowledge to the very young. If you were to become a teacher in a secondary school you would be required to have a year of training at a Teachers' Training College, but if you reach the heights and are appointed a university teacher it is very unlikely that you will have any instruction in teaching at all and your power of imparting knowledge will be examined only by your students. It is true that in some departments all the members of the department rehearse some of their teaching or their papers in front of their colleagues, but in general in a university there is no instruction in the art of explanation. If this state of affairs still exists when you become teachers put it right. Universities should appoint people whose duty it is to investigate the effectiveness of the teaching. This will be very difficult because the experts in the technique of teaching may have little or no idea of the substance of the university lectures they are criticising. But, even so, they might be useful if they did no more than increase the audibility of some lecturers.

I wonder what changes you, when your time comes, will make in the medical curriculum, whether they will be serious changes, or the sort of superficial change which has been going on for the last twenty-five years, since I have had anything to do with medical education. I wonder, for instance, whether you will divide the profession into those who do a short course to become general practitioners, and those who do a long course and become specialists. I hope not. We already add to the common course the longer specialists' training. If, for instance, you want to become a surgeon you have, after qualification, to take your Primary Fellowship and then your Final Fellowship. This, even for the brighter people, means at least nine years and an average of over ten from the time you enter the school until you become Fellows of the Royal College of Surgeons, and can start learning something about practical surgery. Perhaps you will wish to introduce an entirely different kind of course for those who are academically dedicated and wish to proceed to a life of research work in the laboratory and the wards.

Lunch-table Views.

Opinions on what should be taught, and how much, and for how long are not lacking. The most casual remark at the medical lunch-table looses a flood of ideas. Some will want less anatomy, some will want more physiology, some will say there is not enough integration, some will pity the hard lot of the modern student, and some will say this is a soft life compared with the days of yore. But sooner or later someone will say, if most of them are going to be general practitioners, why on earth do we teach this, or what is the use of insisting on that? They might criticize the curriculum and say, "These specialists want you to know how to do the operations. Why should you? You will never have to do them yourself." Or they might say, "Why should you be taught to recognise things under a microscope? Most general practitioners do not even possess one." "Why should you want to know how to read X-rays, when all you need to know is how to read the report?" You could go on to say, "Why do you need to use the stethoscope when you can refer people for an X-ray?" I am glad that you hardly ever hear anybody say, "Why do you want to teach them to examine the patients when they can be referred to a hospital?" So what are we to teach the future general practitioners?

What is Education for?

Now before we can answer this sort of question we must pause and settle in our own minds what education is for. There is, at one end of the scale, the course of technical instruction to fit the pupil for some particular craft. You can be taught very accurately how to plaster a wall, or lay bricks, without having any knowledge of the physical chemistry of mortar and cement. At the other end of the scale there is a desire for a broad education in the humanities and in mathematical and scientific studies. Let me, in parenthesis, say something about the humanities. This means the study of the literature and language, and history and art of human culture, and it particularly refers to the classics (the Oxford Dictionary refers to it as polite scholarship). But the humanities have nothing to

do with the first-hand study of humanity as you see it when you study medicine and surgery. That has always seemed a bit odd to me but the custom has grown up that way.

We do quite a lot of lip service to the humanities, hoping somehow to include them in the curriculum of the medical student, but recently we have excluded Latin from our entrance requirements. I believe that this is a correct decision on our part, because the Latin required was only at junior level, and at this level it gave pain rather than education. As a set part of our curriculum I do not think we should include the humanities and I do not think we can. But surely the study of literature and language and history and art must be the study of all educated human beings, it must be not so much part of their training for life as a habit of self-education, a development of an attitude of mind, a habit of mental progression, an enduring appetite for learning, and the power of explaining and imparting the knowledge to your neighbour, and so making life more intelligent and more enjoyable for yourself, and ultimately, and as its most important goal, to make you of greater service to your neighbour and to the community at large.

But, nevertheless, I believe in the future we must guard against regarding our education as doctors becoming a purely technical training. It must be a wide and multipotent education from which we can, in the future, as heretofore, branch out into any one of many different departments. If there is any person that we should keep in mind in planning the education in the future I believe it should be the multipotent resident medical officer.

Shortening the Curriculum.

If any of you were to suggest shortening the medical curriculum he would meet with universal approval from all medical teachers. They would form a committee to discover how this shortening could be brought about. A. would say that the amount of B. ology or C. ology should be reduced and D. would say that he was in complete agreement with A. but he thinks that A. ology should be reduced as well. And so it goes on until in the end you are left with a curriculum, as a rule, slightly longer than it was before because it is discovered that since they last met the importance of E., F., and G. ology have become so great that we cannot ignore their demands for some place in the curriculum.

Even if we do not lessen the amount to be learnt we can shorten the process of what is usually called integration by bringing together the parts of a subject in time and space, and teaching them as a whole. You have had here a very good example recently in the Skin Symposium, organised by the B.M.S.A., under the presidency of Dr. Beare, and I am sure you have learnt a lot from it. That was integration. It took a great deal of trouble but it worked.

The process of learning can also be made simpler if we are more systematic. That is to say, if we work more methodically and learn more according to a plan and not in a sporadic and unintentional sort of way. No schoolmistress, teaching her young pupils arithmetic, would think of teaching them one day that twice four is eight, and three sevens are twenty-one, and seven sevens are forty-nine,

and then leave for another day the teaching of the facts that twice five are ten, and four sevens are twenty-eight, and seven eights are fifty-six, and then on a third day a similar jumble of the multiplication tables. No, they are taught, of course, the two times table one day, the three times table a little later on, and then the four times table, and so on. But it is precisely what the kindergarten schoolmistress must not do, that we have to do in clinical medicine. We have to learn and we have to teach the phenomena as they arrive at the hospital. The patients do not come in the right order and so the systematisation must occur in your own heads. You must piece together the various bits of information you pick up, sometimes far apart in time and space, and you must put them together, as it were, in your own multiplication tables.

Television.

That is quite correct, but that is no reason why we, as teachers, should not in the future attempt more and more integration of our teaching. We have already begun but we have not pressed on hard enough. We have remained individualists too much. But if we really want to integrate our curriculum better we have a tool for the purpose which is second to none. That tool is television: close circuit, colour television. At present it is very expensive. To put in a television apparatus here, to provide us with three points from which a programme could be obtained, and one room in which it could be viewed by a class of students, would cost us £60,000. Although I believe it to be cheap at the price, it will be difficult, for a while, to persuade those who provide us with our money, that it would be money well spent. But it offers us the best hope, so far, of shortening the medical curriculum, and at the same time, making it a good deal more effective than it is at present. So great would be the change in our methods that we might, indeed, have to wait until a new generation of teachers had arisen, willing to spend much time and effort in learning to use it.

You know how often you hear people say, "I never forget a face but I cannot quite put a name to it." If you were to meet a hundred people and get to know their names, it may be that some time later that you would be able to recognise 80 per cent. of the faces, but recall only 20 per cent. of the names. But the more you saw them the higher would rise the percentage of those whose names you could recall. Recognition is a much easier process than recall, but it is the power of recall that is required in most of our work. Not only must we be able to say that we have seen something like that somewhere before, but we must be able to say what it is and what we have to do about it. And to some extent the facility with which we can recall is related to the number of times we experience the phenomenon or disease, or whatever it may be. Television would increase the frequency of our experience and allow a much higher rate of recall.

It will, undoubtedly, be argued that you cannot possibly learn how to operate by television. You cannot possibly learn to recognise disease by television. And that, of course, is quite true. One would not attempt to replace any part of the first-hand clinical experience of the student by the second-hand experience of television. I would like to make it quite clear that I do not suggest that any part

of our present clinical teaching is replaced by television and I hope that no one discussing or reporting this will make the mistake of suggesting that we should stay at home looking at television rather than working in the wards. I hope I am quite clear about that. However, one could argue like this. If you have seen a large number of photographs and portraits of some famous person and then at last you get an opportunity of seeing that person face to face, your experience is very much more vivid than if you are seeing a stranger, and the few moments you are in their presence become a vivid, unforgettable memory. Those of you who have seen Her Majesty face to face, I am sure, will appreciate my point.

We must be very careful not to use television as a stunt. (I believe it is now called a 'gimmick.') Its serious use will be to show *the small to the many*. You know how often you crowd round to try unsuccessfully to see some small lesion which is being demonstrated to you. This applies, perhaps most intensely, to various forms of endoscopy. It is a most difficult thing to demonstrate convincingly what you see in a bladder on cystoscopy, or the liver on peritoneoscopy, to more than one or two people at a time. But with television it is quite possible for cases to be demonstrated to as large a crowd as you wish, and demonstrated very effectively, as Mr. McMechan was able to show to the Association of Surgeons here two years ago.

It is dangerous for a large number of people to crowd into an *operating theatre*, and even if you do you often cannot see anything worthwhile. But with the use of television the main points of living pathology of the patient and the procedures carried out will be demonstrable to everybody without the delay and expense of their scrubbing up and wasting long hours in the operating theatre. Viewing galleries may be better but are more expensive and give a view to a smaller number of people.

Television can take you into the screening room of the X-ray Department without the delay of dark adaptation or even the necessity of leaving the ward and going to the department and breathing down the neck of the radiologist. Indeed the radiologists themselves are already seeing their cases by various forms of television interpretation.

The frightened child who comes timidly and reluctantly to hospital is often appalled at the crowd of students that collects round him especially if he is hurt. In this sort of case and many others, particularly in child psychiatry where the presence of spectators spoils the psychiatrist's work, television would offer many good opportunities to the student.

A great deal of skill and experience is needed in the care of the *dangerously ill*, or seriously injured, and we just cannot teach on them to a class. We can only demonstrate to one or two at a time. But with the aid of television it would be possible for the sick room, or the casualty room to be visible to a whole class, without any inconvenience to the patient.

We could multiply these examples almost indefinitely. But before leaving the subject of television I would like to say one thing. And that is I believe that in developing this very important method of teaching, and I am sure we must, we should be very careful to remember George Orwell's play, "1984." Wherever

possible the consent of the patient must be given in writing just as we have a consent for an operation now. And, furthermore, we must on no account allow the transmission of the hospital teaching television to go outside the hospital. The viewing rooms must be open only to students who are under a professional oath, not to divulge anything that they have seen to anybody. Indeed I would like to say, in parentheses, that the oath should be taken when we enter the wards as a student, and not only when we qualify.

Indirect Teaching.

If you specialise in one subject you can hardly be expected to be an expert in a lot of other subjects as well; if you are a good surgeon or obstetrician you cannot also be expected to be an expert in psychiatry, social medicine, or morbid anatomy. As you grow older I hope that your surgery will remain reasonably up to date, but your psychiatry and your social medicine and your morbid anatomy may atrophy. If they atrophy so much that you become very ignorant about them you might react by disregarding them entirely, or even by condemning the subject as being somewhat unnecessary. Now for a teacher both these are bad. Another form of integration which I hope you will do better in than we have done is to keep up with your other subjects, at any rate at undergraduate level, not so that you can teach them but that you can understand what your students are learning in other departments and be willing and able to learn from them, and at least teach nothing which conflicts with better-informed opinion. I believe that this sort of indirect teaching applies perhaps more than any other to the subjects of psychiatry, social medicine, and morbid anatomy. If the clinician knew more about these subjects I think his teaching would be proportionately more effective.

Resident Appointments.

When you qualify and have donned your gowns and hoods and paid your money to the General Medical Council and have acquired a House Surgeon appointment you start on your year of compulsory residency. This was instituted a few years ago to make sure that everybody benefited by this valuable period of training. If you follow your predecessors in their habits you will do an average of eighteen months as a Resident House Officer when you are qualified. This is not enough for two reasons (1) because of its value to you, and (2) because more house officers are needed to run an efficient service.

In Northern Ireland there are just under 140 vacancies for resident staff; there are, say for the sake of argument, 70 graduates from Queen's University in a particular year. If none leave the country to find employment elsewhere but all stay and all do eighteen months resident appointments then it follows that of those 140 posts 35 will be permanently vacant and will have to be filled by graduates from other universities. Now this state of affairs is as bad, or worse, across the water. Many country hospitals and hospitals in industrial areas away from the teaching centres are being staffed by graduates who are from foreign universities, from Pakistan and India, Egypt, South Africa, the West Indies, West Africa, and, of course, Australia, New Zealand, and Canada. Most of these men come

here to do postgraduate studies and it is very unfortunate that they are sent out into country hospitals, very often to manage for themselves, without adequate supervision and sometimes to hospitals where there are only occasional visits from consulting staff. They come to learn their job by trial and error on British patients.

The period you spend as a resident in a hospital is probably the most informative period of your clinical career and should not be hurried through to reach the richer and riper fields ahead. In it you learn to put together the theory that you have learnt and the practice in which you will be spending the rest of your lives. It should last up to about four years; with the last year being one of considerably more responsibility. Not, I think, of the type of residency which they have in the United States and Canada. I know they are very proud of it and defend it very hotly but I think that their system is a bad and shortsighted one for all the glamour that Halstead and the American College of Surgeons have given it.

If the period of residency is to be prolonged, as I believe it should, it will be necessary to make provision in hospitals for adequate married quarters for the resident staff.

What else will you learn as a House Surgeon? Well, first of all as I have already said, you will consolidate your theory with practice. If you are wise you will develop the habit of punctuality.

A voice from the loudspeaker:

"You're a fine one to talk of punctuality;
Oh, what a platitude, what sheer banality!
Oh, I know you've always got an excuse;
But what the deuce is the use of excuse,
Unpunctuality is near immorality."

GALEN.

It is as important to learn the habit of self-education, even more intensely than you have learnt it as a student. One of the things that you will learn is to get away from Galen. Let me explain what I mean by this. Galen was a great man, he was physician and surgeon-in-ordinary to Marcus Aurelius, Emperor of Rome, and he flourished in the second half of the second century A.D. He was a prodigious worker and a prodigious writer. He covered most aspects of medical science with such learning and with so great a degree of accuracy that his works became the standard textbooks for fourteen hundred years after his death. It was not Galen's fault that all through the Middle Ages people clung to the habit of reading him and did not look or think for themselves.

Now in your student days you have perforce had to take a great deal of notice of what your teachers say. You could not sift everything they said yourselves, but when you become a house surgeon you will soon learn that a lot of the dogmatism that is thrust down your throats in lectures and demonstrations is really a little shaky. The dogmatic teacher in the demonstration room and on a ward round very often becomes, when you meet him over a difficult emergency,

very thoughtful and worried. I do not suggest that you take nothing from your teachers and that you try to find out everything for yourself. But you must learn to teach yourself from the phenomena you see in front of you. If you observe correctly and differ from the authorities it will be the authorities who are wrong.

Another thing that you will learn when you become a resident, and maybe some of you have learnt it already as pupils, is that there are times when you have to produce of your best, although you may be very tired and very sleepy. You must know some things so well that you can remember them even if you are hardly awake. There are certain common features of disease you may want to learn in so automatic a fashion that you can use them like a formula in mathematics, without, at the time of their use, bothering with the full proof of the formula. Collect clinical formulæ and know their "proof."

When you become a resident you will, for the first time, be left with the responsibility of relieving pain and giving succour to those in grief. No one can teach you this. You have to learn it in your own heart and it is one of the most taxing and important things that you will learn during this very valuable period of your training. When I say learn, you will begin to learn, for your learning will never be anything like complete, however long you may be at your task, and however long you may continue to practise medicine. You will never get used to this aspect of your duty. I remember some lines written in a hospital corridor "On Seeing an Old Man Come Away Grief-stricken at the Loss of His Wife":

"Slowly, dismayed, in grief's oblivion,
His wan face forlornly looking forward,
He moves down the cold corridor of time,
His memory fondly roaming in the past,
His lonely fears in dread the future shun;
Upheld by kindliness, but unassuaged,
The pangs of sorrow suffer only hurt.
Nothing can their sting remove but love.
Be gentle then, dear one, with all your grief;
God, in His time, will give you slow relief."

In this aspect of your work there is likely to be no change. Your duty will always be as urgent and your responsibility always as great. And if you are ever tempted to feel that you are doing a job of work like anybody else think back to that old man.

You will also have to learn to temper your enthusiasm with judgement and your burning desire to help the sick and to save life by a realisation of the inevitable. Nowhere will you feel the strain of conflicting claims more than in the care of the very ill and the dying. You will be taxed to your utmost physically, mentally, and spiritually. You may find one of the hardest things to learn is when to stand aside doing nothing as a doctor but to stand by in patience and sympathy as a friend.

Listen to some lines by a doctor in the post-mortem room:

"Calm and cold the struggle over,
We have fought but death has won.
Your white-haired dignity is conquered,
Beloved patriarch of Deeny Street.
The many wounds of my infusions
Mock me like the marks upon your brow,
Where with soreness strapping held our tubes in.
The arm splint left those marks; I see them now
Oh! if you could only tell?
When you had thoughts alone of heaven
Was I making earth a hell?"

What will Become of You?

When you have finished with that part of your career which is called your training what will become of you? If you are like the first 500 who qualified after December, 1947, half of you will have an address in Northern Ireland and a little more than a quarter elsewhere in the United Kingdom, and a little less than a quarter abroad. Thirty-two per cent. of the 500 are in general practice, 30 per cent. in specialities. Twenty per cent, were women, and of this 20 per cent. 13 are known to have married and given up whole-time medicine, another 5 are not in the Medical Directory under their maiden names. The remainder, 2–3 per cent. of the total and 10–15 per cent. of the women, are using their professional abilities full-time.

Of the 500, 29 are in Canada; 17 in the United States; 20 in Africa; 8 in Australia; 6 in the West Indies; 12 are missionaries; 11 have joined the armed forces.

We have not enough information to say what 43 are doing.

General Practice.

Now again if you are anything like your predecessors about a third of you will go into general practice, some in the country, and some in the town, and some in large towns. But it is with general practice in towns that I want to deal. We are fortunate in this part of the world in having a very large number of good, conscientious, learned, and hard-working doctors, and you will find many of them in the country and some of them in the towns. But in the towns as well there is a type of doctor growing up that will one day ruin his branch of the profession, and it will not really be his fault. The type of doctor I mean is the man who as soon as he sees a case with any difficulty about it at all, and sometimes with none, refers it to the hospital. Now he does this because he feels that if anything goes wrong with the case he will be to blame for not having sought specialist advice. He gradually allows himself to be driven to believing that a large proportion of the cases he sees require a specialist's advice. I suppose he ought to examine the case completely before he sends it up and make his own diagnosis, but he has a large surgery to get through; there may be 30, 60, 90 people waiting to be seen, and so, life being short, it is quicker for him to send

the patients straight up. Now the patient, as a rule, does not suffer because he gets his consultant opinion, or his X-ray, or whatever it happens to be, quickly. The important thing is, in this arrangement, that the patient does not suffer and therefore the doctor is tempted to do more and more of it.

Now what always surprises me is not that this sort of thing happens but that it does not happen more often. It seems to me that the good doctors, and there are many of them in this town alone, very good doctors, seem to me to do their work conscientiously and practise their skill from a sheer love of their profession, and a willingness to be helpful themselves to their patients. I believe these men are living on the disciplines of the past. They are trying to be the sort of doctor that has built up our profession into the position of esteem it still holds. I am afraid that they may be a dwindling race because there are so many handicaps put in the way of their doing their work well. How can this be improved?

Lord Taylor, in his article in the *British Medical Journal*, "Hospitals of the Future," says: "I must confess to seeing no future for general practitioner beds, except in very remote areas. That is not to say that some G.P.'s, with special experience, should not have a proper place in hospital. But if general practice is to mean full specialisation in extra hospital medicine, in the home, the surgery, the clinic, the school, and the factory, there is no time for looking after patients properly in hospital. What the G.P. needs is open access to the pathology, X-ray, and physiotherapy departments; a good domicilliary consultant; home nursing, home help, and health visitor service, at his disposal and proper secretarial help. All this is coming fast though most slowly round the teaching hospitals." Surely the best way of providing the access to the pathology, X-ray, physiotherapy, and secretarial departments would be best accomplished by being a member of a hospital staff, teaching or otherwise.

General Practitioners in Hospitals.

The general practitioners, within reasonable distance of a hospital, should have their consulting rooms and their secretaries and all their records in the hospital itself, and they should be part of the staff of the hospital. Their surgery should be conducted in rooms within the precincts of the hospital and they should have every facility for X-ray and laboratory investigation at their disposal. I can see that the planners will be getting ready with their spanners to throw them in the works of this scheme. Far too expensive! Flood the X-ray department! Swamp the laboratory! But the argument against all this is that if there are patients outside needing these investigations done and they are not having them done because of the cumbersomeness of the present arrangement then our service is not working. It will be easy, once the doctors are in the hospital and of the staff, to deal with the over-enthusiastic and, of course, the man who has so many investigations done he has no time to read the reports. This could all be dealt with, as it is now, by the Nelson touch.

The advantages would be enormous—an easy interchange of information and opinion, unhandicapped by letter writing. Life for the G.P. would be more interesting and his rôle of guide, philosopher, and friend would be increased in

its value to his patient by the great extent and accuracy of his information.

There would have to be, of course, initially an increase in hospital buildings, but there would be, in time, an enormous saving of expense. This would incidentally be less expensive and work more smoothly than building health centres all over the place, like the white elephant at Woodbury Down, of which we once heard so much and now so little.

But unless some such change as this is produced I believe that the public will gradually realise that many of the general practitioners, particularly in the large industrial towns, do not really do very much doctoring for them. They sign their certificates, they give them bottles of medicine, they provide them with letters to go to hospital, and perhaps a few other things. I think, if this generation might begin to see that, then the next generation might well begin to wonder if these doctors are really necessary and if they are worth their pay.

I only hope that those responsible for planning our service will be farsighted enough to see that the present system is gradually moving to bankruptcy, and cannot be allowed to go on.

This, of course, will leave a large number of general practitioners who do not live within a few miles of a hospital, and so could not be included on the staff of any existing hospital. They will either have to carry on as they do now, or if they can be grouped into sufficient numbers where there are not now hospitals they could be accommodated in health centres with a small number of beds provided. This has been done in some of the remoter parts of Scotland and England.

Surgery.

Surgery is still dividing itself up into specialities and these specialities are still producing an improved service to the patient. While that state of affairs goes on we must expect more specialities to branch off from the main body of general surgery. But what will become of general surgery? It is already something of an error to refer to it by that name, for more than half of surgery is now taken over by the specialist, leaving behind an ill-defined subject that could best be known as abdomino-miscellaneous surgery. But however much we general surgeons may deplore the removal from our hands of interesting cases we must do nothing to stop a better service being rendered to the patient, if that service can only be rendered by one man collecting together a series of cases and becoming an expert. What I think we can look at a little wryly, and with justification, is when the speciality begins to be less interesting to the individuals and they reinvade the territory of general surgery.

Let us turn our attention for the moment to the specialists. If they merely become technicians in their field they are doing surgery as a whole and the patient as a whole a great deal of harm. Those who go into the various branches, like neuro-surgery and thoracic surgery in particular, must become physicians in their own subject and know something of the radiology and the morbid anatomy, and from that they must spread out and maintain an interest in general medicine and surgery. If they allow themselves to become pure technicians then I think they are doing themselves and their work a disservice.

We often hear people talk about a general background, or a background in general surgery before specialising. This background has sometimes meant a training in general surgery before the individual branches out into his speciality. This, I think, is a dangerous thing because the specialist who thinks he is a good general surgeon, of say twenty years ago, is a dangerous individual. The background must be continuous, like the backcloth of a play. The background of general surgery, or general medicine for that matter, must be a habit of mind and not a training that is over and done with. The specialist must be interested in all branches of medicine that have any bearing on his subject and maintain a lifelong interest in them.

Research and the Future.

Galen, as I have said, wrote widely on all aspects of medicine and on much besides. Harvey in the seventeenth; Hunter in the eighteenth; Thomas Young in the first part of the nineteenth, all did the same. As the nineteenth century gave way to the twentieth most of the great names of medicine and science were the names of specialists. Specialists in physics like Rutherford and Kelvin; in surgery like Lister. But, while there was a great deal of fragmentation in all departments of knowledge, in the biological sciences the great advances usually came by the gap between the laboratory and the wards, between the student of basic sciences and the bedside clinician, being bridged by one or other, or both. Lister was aware of the putrefaction in Pasteur's flasks and understood what it was about. Fleming, Flory, and Chain were aware of the clinicians' problems and worked with the clinicians at Oxford. Kendall and Hench, by their interaction, produced Coritsone, and so on.

This generation is seeing an acceleration in the process with already the most exciting results and the very great probability of our whole field of knowledge moving in a new dimension.

In one direction we have progressed through the phase of gross anatomy and morbid anatomy, histology and morbid histology, to cellular studies and now to intracellular micrometabolism where many biological disciplines meet round the fascinating studies in molecular structures of more and more complicated organic substances, the structure of which is gradually being understood by the application of physics and mathematics. From all these investigations, very exciting to contemplate and even more difficult to understand, will emerge from time to time the answer to distressing clinical syndromes or a congenital disability if we, in clinical medicine, keep enough contact with these more fundamental studies of biology.

In another direction our knowledge of observational medicine is also accelerating. We are looking more intelligently, observing more closely, and recording more exactly than a generation ago. Controlled clinical trials were rare a generation ago but now one sees the results in every Journal one opens. Careful clinical observation is now more often truthfully sifted by statistics. The calculating machine has been part of the equipment of the average clinical laboratory for over a decade; and if we can learn how to make use of the electronic

computer, we may discover aggregations of clinical phenomena about certain physical disabilities, mental defect, or genetic misfortune. And having discovered them we may be able to go back to the basic scientist and find the key to the problem in some abheration of molecular structure. Professor Pauling, whose work in molecular biology and particularly on the hæmoglobulins is outstanding, thinks that by 1967 we will have the first complete structure determination of a protein molecule which will bring about the start of a change from microscopic and cellular medicine to molecular medicine.

These two processes, the study of the minute and the study of the whole, is likely to produce its most exciting results in the study of the nervous system. Intense work is going on with what has been called the single unit approach. The study of the single nerve cell was made possible by the intracellular microelectrode and the use of isotopes. At the same time the integrative aspect of nervous functions has advanced. We have a better understanding, for instance, of the ascending reticular system and its relation to consciousness. We do not yet understand the molecular mechanism by which nervous impulses are propagated to muscle and still less do we know how thought can influence the discharge or synthesis of hormones, or hormones influence processes of thought.

The pattern is fitting together rapidly and, as the jig-saw pieces fit together, loose pieces lying before us for a long time suddenly take on a new meaning.

For us the "abendland" is aglow but our "abendland" is your dawn.

My purpose in mentioning these things is not to pretend that I speak with any authority on any of these but to say that while I barely understand what I am saying I feel a hunger to know more; a hunger that cannot be satisfied until I understand much more than I now do of the subjects you have so lately left behind you. Keep your basic science bright; you will need it all in the intellectual atmosphere you may be entering. It will help you to put together much that now seems unrelated in medicine. You might, like Galen of old, be able to take within the compass of your understanding a greater width of our science. Perhaps by knowing more about molecules you may understand more about man.

There is a view among many people that there is something mystical about research and only rather special people can have a hand in it. And some believe that research is publishing articles in the journals and if you do not publish it is not research. Indeed the very bulk and volume of medical literature, much of it repetitive and useless, is a hindrance to progress. Look back at Tycho Brake, the great Danish astronomer, and his better-known assistant and pupil, Kepler. Tycho spent a lifetime observing the heavens and making exact and thorough records of the movement of the celestial bodies throughout the year and for many years on end. Working on Tycho's facts, and inventing the mathematics with which to express them, Kepler formulated the laws you learnt in your physics.

I might have cited Ptolomy and Copernicus. The point is that the careful observations of one man or one generation in a medical school may lay the foundation on which the next will build. We can all help in research if fame is not our only spur.

In the process of bridging the gap between the ward and the laboratory the whole-time professorial units, clinical and paraclinical, have an important part to play. While their primary duty is to serve their patients with a standard of kindness, conscientiousness, and skill at the highest level, they must seek to help in the bringing of the disciplines and discoveries of science to the problems of the sick man and the sick community. Where it is not possible for one man to do this, partnerships and teams must be formed. The exacting tasks of surgery make this necessary and I am fortunate in having as a colleague Professor Welbourn with whom to form such a partnership.

Like a painting of Sickert, I have left much of the canvas bare. I have not dealt with the B.M.A. and why it should spend more of its time on raising our standards of discipline and service.

I have not dealt with wide functions of the World Health Organization.

Nor have I touched on the medical aspects of space. There has been no time to mention the great speculative works of Jules Verne or Daniel Dare, or talk of sputniks or re-entry.

There are many things of great interest and importance that time and your patience require me to to leave unsaid.

The future is yours and those of us who are older will watch your careers and progress with affection and anxiety, hoping you do not repeat our mistakes and hoping that you, learning from our shortcomings, will enrich your knowledge with wisdom and your diligence with charity.

CHRONIC BRONCHITIS: DIAGNOSIS OR DELUSION

By **ALAN P. GRANT, M.D., F.R.C.P.I., M.R.C.P.(Lond.)**
Consultant Physician, Belfast City Hospital

"THE syndrome has its philosophical basis not in specific disease factors but in a chain of physiological processes, interference of which at any point produces the same impairment of bodily function. The same syndrome may thus arise from many different causes. This newer view inspires a far more catholic concept of ætiology and renders pointless many existing controversies."

—SIR HAROLD HIMSWORTH (1949).

"Chronic bronchitis" is today one of the commonest conditions diagnosed in the ageing populations of this country, especially males of the working classes. Much energy and expense is involved in the research into this social problem, so obviously if chronic bronchitis is not a disease entity eventually wasted time and poor treatment must result. Recently Logan (1959), while discussing the problem of flax dust byssinosis in Belfast, has drawn attention once again to the fact that this diagnosis is considered both confusing and dubious by certain physicians. He has stated that chronic bronchitis of primary bacterial origin if it does exist is rare, and suggests that the term Chronic Non Tuberculous Chest Disease (C.N.T.C.D.) should be used for all chronic pulmonary conditions not in the tuberculous category, in which presumably the cause is as yet obscure. The plea is made that the use of this terminology would lead to better identification of these diseases many of which at present are labelled "chronic bronchitis." Before accepting this suggestion and doing away with a term hallowed by tradition it is necessary to examine the history, clinical syndrome, pathology, and radiology of the diagnosis "chronic bronchitis."

It is the purpose of this communication to take stock of the concept and see if it is justified as describing a patient's illness or disease. If to call a patient a chronic bronchitic means giving another doctor a description of his condition and symptoms, it is reasonable, and especially so if there is a picture of a precise pathological state causing them. The word diagnosis is derived from the Greek words meaning "to know" and "between" and may be defined as distinguishing a disease state by means of its symptoms and signs. Unfortunately in chronic chest diseases it is often difficult to distinguish the different ætiological factors in individuals and the term C.N.T.C.D., although clear enough in a negative manner, must also be examined carefully before accepting it into common usage.

HISTORICAL.

The diagnosis of "chronic bronchitis" was introduced into medicine by Charles Badham, physician to the Duke of Sussex in 1808. He recognised a disease in men past middle age distinguished by winter cough and tightness in the chest. Symptoms were worse in the mornings and aggravated by bad weather conditions. Buxton, in an essay on "Winter Cough" written in 1810, gave a description of

the condition many of us call "chronic bronchitis" which could not be improved upon:—"Those who are affected with winter cough generally feel themselves very well during the warm weather of summer. But when the winter comes they are affected with severe coughing. It is generally brought on with a considerable degree of violence whenever they go out into the cold air; and is easiest during the time of their continuance in a warm room. The moment they open the door of the sitting room to go out they begin to cough severely. Their breath is generally extremely short and they frequently walk with a considerable degree of difficulty; and an exertion rather greater than usual is very severely felt."

Soon after this Laennec in 1826 considered the problem and introduced the conceptions of emphysema and asthma. The relationships between "chronic bronchitis," "emphysema," and "asthma" have continued as a source of discussion and sometimes disagreement to the present day. Laennec was not satisfied that "chronic bronchitis" was necessarily a true inflammatory condition and called it "pulmonary catarrh." Nevertheless in English literature the diagnosis has continued to be made, so much so that it has often been called the English Disease. In other countries and especially America many physicians have considered adequate investigation of "chronic bronchitis" should reveal some other underlying pathology, and as a last resort "diffuse tubular bronchiectasis" might be diagnosed. Emphysema is considered by others to be a separate entity. Even in British literature there have been doubters and Lister (1949), in an article entitled "Chronic Bronchitis—never a complete diagnosis," has discussed conditions which he considers may masquerade under the title. The points which he raised are summarised below:—

1. Left ventricular failure of mild degree may occur when an infective illness produces decompensation in an elderly arteriosclerotic patient.
2. Infected antra or other foci in the upper respiratory tract, bronchiectasis, cystic disease of the lung or pulmonary neoplasm should be thought of in every patient with a chronic purulent sputum.
3. Chronic senile phthisis may only come to light when frank tuberculosis develops in a younger member of the family.
4. Occupational diseases, for example, silicosis and asbestosis, should also be excluded, although the author considers byssinosis to be an allergic state of the asthma type.

He concludes that asthma or allergic bronchospasm may mask any of these underlying disturbances in a sensitive subject. Emphysema is the eventual result and infection is only secondary and due to the unhealthy mucosa. This view has been aptly put by Logan when he states that idiopathic emphysema results from external irritant dusts or fumes often combined with an inborn asthmatic tendency. There is, however, a trend even among the Americans to consider the diagnosis of "chronic bronchitis" respectable mainly as a result of publications from the Brompton Hospital which have been brought together in a monograph edited by N. C. Oswald (1958).

Clinical Features and Ætiology.

The usual application of the term "chronic bronchitic" has been confined by Oswald et al. (1953) to patients with "a disease which appeared to be predominantly affecting the bronchi and having cough, sputum and breathlessness as the outstanding symptoms, without evidence of other important primary or precipitating disease of the respiratory, of cardiovascular system or other part of the body. They all had some degree of disability from either breathlessness or infection or both and the symptoms had persisted not necessarily continuously for at least a year." Asthma was taken to mean periodic attacks of breathlessness with a feeling of tightness in the chest and difficult expiration. Exactness of definition Oswald (1958) felt to be difficult for the following reasons—(1) It is difficult to draw a clear line of differentiation clinically between asthma, bronchitis, and emphysema in many patients. In this respect the terms are not always used in the same sense in different countries or by different physicians. (2) Minor degrees of disability may have to be judged on one symptom alone, either shortness of breath or exacerbations of infection. (3) The time factor is important and symptoms may be either constant or intermittent. He concluded that the shortness of breath should exceed that of normal persons and the exacerbations of infection interfere with normal life, and considers pure emphysema without either bronchitis or asthma to be very rare. For statistical purposes the definition of the Pneumoconiosis Research Unit has been used by Olsen and Gilson (1960) in a comparison of the incidence of bronchitis in South Wales and Bornholm—patients had to have a persistent sputum and at least one chest illness in the previous three years. Fry (1954) found 10 per cent. of all attendances in a general practice to be due to "chronic bronchitis" which he diagnosed when there was a recurring productive cough and variable sputum to which some degree of dyspnœa was superadded. He excluded cases of asthma, bronchiectasis, tuberculosis and neoplasm.

The standard medical textbooks, when consulted on the subject of "chronic bronchitis," tend like most physicians to be a little vague and loose in terminology. Young, Beaumont, and Boland (1956), in Price's Textbook, state that inflammation of the bronchi may be induced by a variety of causes which they group as bacterial, chemical, and mechanical, and they state that classification is therefore difficult, especially as the extent and severity may vary so considerably. They stress the sex difference and climatic influence and note as favouring conditions —pulmonary congestion from cardiovascular disease or nephritis, as well as asthma, arrested pulmonary tuberculosis and the pneumoconioses. The underlying pathology is considered as a chronic inflammatory change of catarrhal nature with either atrophy or hypertrophy of the mucous membrane. This is always complicated by some degree of emphysema, and in severe cases there is an additional peribronchitis or bronchiectasis. Tidy (1954) notes as well as the above ætiological factors the importance of upper respiratory infection, excessive smoking, repeated attacks of acute bronchitis or fibrosis after pneumonia. The pathology, he states, is atrophy of the mucosa and the symptoms dyspnœa, cough, and sputum. Maxwell (1945) stresses that chronic bronchitis is a degeneration

of the mucous membrane primarily of vascular origin in which infection is superimposed. Coope (1945), although he diagnoses "chronic bronchitis" considering it to be a chronic catarrhal condition, does not believe it often results from acute bronchitis. The attitude of North American teachers as stated by Cecil and Loeb (1959) and Boyd (1944) is that there is a tendency to include emphysematous patients under the diagnosis of chronic bronchitis in Britain. Cough and spit are the only physical signs and these of course may simulate or co-exist with other diseases. The conception of the disease as a condition in which bacteria establish themselves in the bronchial walls and keep up inflammation year after year is considered unlikely. Other factors, especially chronic venous congestion from heart disease, sinus infection and bronchiectasis must be sought. The mucosa may be hypertrophied or in long standing cases atrophied.

It may be concluded from the text books considered above that there are various clinical types of "chronic bronchitis"—profuse expectoration of mucoid sputum or bronchorrhœa often leading to asthma; chronic suppurative bronchitis where the sputum is purulent and fœtid; chronic fibrinous bronchitis with severe dyspnœa abating after expectoration of fibrinous casts; bronchitis sicca with an atrophic mucosa and irritating cough but scanty sputum.

Physiology.

Since the war much interest has been taken in the disorders of respiratory physiology resulting from chest diseases. The concept of respiratory failure and its varying mechanisms has recently been stressed by Melville Arnott (1960) and the principles underlying normal and abnormal pulmonary physiology have been clearly set out in the monograph of Comroe et al. (1955). It would not be out of place to restate the main points which require appreciation in the functional assessment of chest diseases:—

1. The ventilation which includes not only the volume of air breathed in time but also the distribution throughout the lungs.
2. The rate of diffusion of gases between the alveoli and the blood which is primarily dependent upon the thickness of tissues in the alveolar wall, the so-called "alveolar capillary membrane." This is also influenced by ventilatory and perfusion defects which may reduce the area available for diffusion.
3. The perfusion or flow of blood through the lungs is normally uniform and the ventilation/perfusion ratios throughout the lung should be approximately equal.
4. The work or effort in maintaining respiration is of vital importance and may for example be greatly increased by resistance to air flow in the bronchial tree reducing the velocity at which air can be moved. On the other hand reduction in the lung volume may be more important, and this includes not only obvious lesions of chest wall or lungs but also increased lung stiffness. These main types of ventilatory defect have been termed "obstructive" and "restrictive" (Meneely and Calloway, 1956).

Before dealing with the defects in bronchitis, asthma, and destructive emphysema which are the commonest causes of disordered pulmonary physiology it is worth pausing for a moment to consider the implications of the term C.N.T.C.D. There are several forms of chronic chest disease which, while non-tuberculous, produce quite different abnormalities of respiratory function. Diffuse fibrotic lesions such as sarcoidosis or chronic diffuse interstitial fibrosis (Scadding, 1960) produce "alveolo-capillary block" syndromes in which the defect is mainly due to difficulty in diffusion of gases across the alveolar membrane. In this respect oxygen being less diffusible is mainly affected and severe dyspnœa occurs on minimal exertion while the carbon dioxide levels of the blood remain normal. Usually associated is a restrictive ventilatory defect in which the lungs being stiff the vital capacity is reduced although there is no obstruction to air flow. Abnormalities of the pulmonary circulation such as multiple embolisation may result in dyspnœa and cyanosis without ventilatory defect. To use the diagnosis C.N.T.C.D. might increase rather than decrease confusion by embracing all forms of disordered pulmonary function in the one terminology.

In the asthma, chronic bronchitis, and destruction emphysema group of conditions, physiological disorders are of the same type, and lung function tests, although of great value in ascertaining the degree of incapacity and responses to treatment, are of less help in distinguishing the exact amount of each of these three disabilities occurring in any one patient. Bates (1958) has considered the difficulties involved and only the main points will be discussed here. In pure reversible spasmodic asthma there is a temporary increase in resistance to airflow owing to a reduction in diameter of the airways from muscle spasm and probably in many instances œdema of the mucosa, while viscid mucus may obstruct the reduced lumen. Once the attack is over both physiologically and clinically there is considerable improvement. This temporary obstructive ventilatory defect which may be relieved by broncho-dilators obviously greatly increases the work of breathing. As the degree of bronchospasm is not uniform the distribution of inspired air through the lungs is uneven, while the blood flow is unaffected, the lung parenchyma being normal. In fact, as pointed out by Gough (1955), the overdistension of the lungs is a reversible process. True destructive emphysema is rare in pure allergic asthma in contrast to its frequency with the infections of chronic bronchitis. The main physiological abnormalities in destructive emphysema are permanent, although accentuations may occur with exacerbations of bronchitis. Again there is an obstructive ventilatory defect which is associated with severe air trapping as the bronchioles are no longer supported on expiration by normal lung tissue. In asthma there is some reduction in inspiratory airflow, although in both conditions the main disability is in expiration. Other disabilities apart from ventilatory defects occur in destructive emphysema. Disruption of the lung architecture may produce uneven perfusion, and the surface area exposed to diffusion is reduced. If it were possible to get a pure case of chronic bronchitis, swelling of the walls and over-production of mucus would produce a ventilatory defect of the obstructive type of lesser degree than in asthma. Exacerbations of respiratory disability in emphysema are due to this cause. It is necessary, therefore,

in any patient where bronchospasm, bronchitis, and emphysema overlap to consider the clinical findings as well as the physiological tests in one's estimation of the contribution each of these three factors makes to the general picture of an obstructive ventilatory defect.

Radiology.

There has been no general agreement that there are specific changes in the straight radiograph which can be attributed to chronic bronchitis per se and no convincing evidence that increased density of vascular shadows is more than an impression. Changes of emphysema, fibrosis, honey combing and transient pneumonia are, of course, found from time to time. A bronchogram, however, will show up the mucous glands like small diverticulæ on the main and segmental bronchi, and calibre changes in the bronchioles may be found throughout the lungs (Simon, 1958).

Pathology.

Little interest has been taken in the general picture of inflammation or catarrh of the bronchial mucosa until comparatively recently. Kountz and Alexander (1934) described the autopsy findings in advanced cases of bronchitis. Changes were scattered throughout the lungs in a random manner. In many instances there was obstruction of the lumen of the bronchioles by chronic inflammatory tissue and atrophy of all the bronchial structures while the glands were less numerous than normal. In other cases there was an element of bronchospasm and the muscle was hypertrophied and sometimes mixed types were found. More recently the careful assessment by Reid (1954) of lungs fixed in the inflated state and sectioned along the bronchi so that the alveoli supplied could be examined has considerably clarified the confusion of previous reports. She examined material obtained from various stages of clinical bronchitis, with or without emphysema, and her findings may be summarised as follows:

In early cases the consistent finding was that of excessive mucus which was associated with both increase in numbers of the goblet cells and hypertrophy of the mucous glands. As the condition progressed there were scattered areas of purulent bronchiolitis with infiltration of the walls by inflammatory cells and plugging of the lumen with pus and mucus. In advanced cases additional features were found associated with recurring infection and resolution that were of different ages and severity. Such changes, it should be stressed, involve the lungs diffusely and in a random manner so that they disorganise the normal anatomical pattern and thus the function of the lungs. In the bronchioles tiny abscesses destroy the bronchiolo alveolar junctions which may become flap valves on resolution, or more chronic inflammation and resultant fibrosis may narrow and even obliterate the lumen with post-stenotic dilatation. As a result of such pathology the alveoli concerned with these airways may show tiny areas of pneumonia or collapse in all stages of inflammation and repair. There may be œdema of the alveolar walls in relatively normal areas and mucus with pus in the alveolar space, while areas of emphysema of varying sizes may be present. In this stage of diffuse and recurring injury complete resolution of the affected bronchioles is impossible.

Reid (1958) has also considered emphysema and its development in detail. Pulmonary emphysema means distension of the lungs with air and there can be little argument with her distinction of two types, distension emphysema and destruction emphysema. The first type results from airway obstruction and may be seen in its pure form in acute allergic asthma. It is really physiological and once the obstruction is relieved the lungs come back to normal. In destruction emphysema permanent disorder of respiratory function results and the normal anatomy is disrupted. The initial mechanism causing this condition may be traced to inflammatory damage and the formation of flap valves at the ulcerated and disrupted bronchiolo alveolar junction, which lead to air trapping in the alveoli supplied by the bronchiole. The walls of these alveoli are weakened both from inflammation and from interference with their blood supply, and it is but a step to disruption of the alveoli and destruction of the capillary bed. Large bullæ may form in certain areas consequent on secondary mechanisms, especially so under the pleura where primary emphysematous areas are not supported. Bulging of the lung occurs and disturbs the normal anatomical arrangement of the septa which form secondary valves.

In fatal bronchial asthma the pathological criteria have been summarised by Robertson and Sinclair (1954) as being (1) Voluminous lungs which do not collapse when the thorax is opened, (2) Mucous plugs in the large and small bronchi with active mucous glands, (3) Hyaline thickening of the basement membrane of the medium-sized bronchi, (4) Hypertrophy of the muscle of the medium-sized bronchi, (5) Eosinophilia. These changes are in many ways similar to those of chronic bronchitis with distension, possibly because the body is limited to certain patterns of reaction in response to an irritant whether chemical, bacterial or viral. The mucous plugs are, however, viscous, eosinophilia suggests allergy and hypertrophy of the bronchial muscle is in keeping with sustained bronchospasm of nervous origin.

The importance of mucus has been noted above and would seem to be the vital component of the "chronic bronchitis syndrome." The relationship to infection has been stressed by many authors and summarised by Oswald (1954). Although mucus is a poor culture medium in vitro, in excess it protects bacteria from destruction by leucocytes and so lowers resistance to bacterial infection; on the other hand there is some evidence to suggest virus inhibition. The thin layer of mucus which covers the respiratory tract is essential to health—humidifying the air, absorbing irritant particles and dissolving noxious gases. The cilia are of equal importance and transfer the mucus from the bronchi to the pharynx and œsophagus. Normally they can deal with 150 ml. in twenty-four hours. In the majority of "chronic bronchitics" there is excess bronchial mucus which cannot be dislodged. It accumulates in the lungs, both obstructing the airways and reducing resistance to bacterial invasion. The viscosity of the mucus is significant and is proportional to its lack of hydration and mucoprotein content, while it is well known that excessively viscid sputum accentuates airflow obstruction.

It may be considered then that in the "chronic bronchitis syndrome" there develops a definite pathological pattern as the result of chronic and recurring irritation. The cause of this irritation may not necessarily be the same in every case and a combination of factors may be present in any one patient. Nevertheless, the diffuseness of the process and its consequent results are consistent with the clinical picture of chronic cough and increasing shortness of breath.

Bacteriology.

Sputum culture has long been in disrepute but modern techniques (May, 1954) (and Mulder et al. 1952) have consistently shown two pathogens, hæmophilus influenza and pneumococci, to be important as secondary invaders. The rôle of viruses in initiating the syndrome is probably great. Certainly on clinical grounds there is much to suggest that infections by these agents are important in many patients. They must reduce the resistance of the bronchial tree but as yet there is little exact information and various possibilities arise. There may be a combination of viruses with bacteria, and it has been shown (Himmelweit, 1947-49) that the bacteria mentioned above reduce the inhibitory effect of mucus on viruses. Latent, relapsing or chronic virus infection of the mucosal cells as occurs in herpes simplex could also be a cause for the recurrence of bronchitis, while from the bacterial aspect H. influenza is extremely difficult to eradicate permanently. It may well be that this organism is never truly destroyed and it has been demonstrated below the bronchial mucosa (Hers and Mulder, 1953). It is also a common inhabitant of the upper respiratory tract and this source could reinfect an unhealthy bronchial tree.

Conclusion.

"Chronic bronchitis," from the clinician's point of view, is a chronic chest condition of varying severity associated with a diffuse unhealthy condition of the airways. The ætiological factors vary from case to case, are multiple, and are both intrinsic and extrinsic, but once the condition is established a fairly uniform pattern emerges. Cough is present and expectoration results from catarrhal inflammation of the bronchial mucosa and although this may not be present constantly, a yearly exacerbation of symptoms is probably sufficient to diagnose the syndrome. There is a diminution of the patient's exercise tolerance due to deficient ventilation. Admittedly in a mild case the incapacity is slight but is quite definite during an exacerbation, and auscultation of the chest is consistent in showing adventitæ scattered throughout both lungs indicating bronchial swelling with increased secretions. These are coarse and maximal at the beginning and end of respiration. It is possible to have chronic bronchitis in association with localised chest disease when it is diagnosed by the diffuse chest signs mentioned above. In many instances bacterial infection is prominent and the sputum is purulent, but in the present state of our knowledge of the possible rôle of viruses and of the effects of atmospheric pollution it is difficult to say whether this infection is primary or secondary. Atrophy of the mucosa may result from a long continued cycle of infection and repair and diffuse bronchiectatic lesions may also occur as a complication. "Asthma" or difficult

breathing is associated with bronchospasm, a term which includes both spasm of the bronchial muscle as well as œdema of the mucosa and by usage is associated with hypersensitivity. It is distinguished clinically by dry sounds (sibilent rhonchi) and a wheezing respiration. We are on sure ground in distinguishing "allergic asthma" where the history, response to broncho-dilators and the severe but temporary nature of the airway obstruction are diagnostic. Eosinophilia and absence of infection are of great importance. In long continued cases of "allergic asthma," however, a permanent infective state of the bronchial mucosa may supervene "asthma and chronic bronchitis." On the other hand some patients with "chronic bronchitis" respond to irritants by developing bronchospasm "chronic asthmatic bronchitis," but whether these irritants are primarily bacterial, viral or inanimate inducing a degree of hypersensitivity in the patient is as yet unknown. It must be remembered that bronchospasm is normally a protective reflex such as might result from breathing irritant fumes. "Destructive emphysema" in the vast majority of cases is associated with a clear history of associated "chronic bronchitis." One occasionally meets cases where there is progressive shortness of breath, and where cough and sputum production are minimal. It is difficult to conclude, however, that these are instances of primary bronchial disease and it may well be that further knowledge will show a latent or relapsing virus infection of the broncheoles. The evidence for primary degeneration of lung elastic tissue in senile emphysema is still far from clear.

In the promotion of further thought on this subject there would seem to be no real advance in giving up the term "chronic bronchitis." In contrast it is suggested that we might qualify the diagnosis for clarity as follows:—

Allergic asthma;
allergic asthma with bronchitis;
chronic asthmatic bronchitis;
chronic mucoid bronchitis;
chronic suppurative bronchitis.

After this one might put in brackets the possible ætiological factors, such as chronic asthmatic bronchitis (byssinosis) and as an associated condition destructive emphysema if such is present. By this means the clinical variants of the "chronic bronchitis" syndrome, and the severity of the established condition are stressed and an awareness of basic ætiological factors relating to the symptom complex is encouraged.

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THE SURGICAL TREATMENT OF DIVERTICULITIS OF THE COLON

A REVIEW OF 38 CASES

By G. W. VAUSE GREIG, F.R.C.S.

Consultant Surgeon South Down Group of Hospitals

THE ætiology, pathology and clinical features of diverticulitis of the colon have been fully described by previous authors (Aird, 1957; Boyd, 1955; Edwards, 1954) and, except in relation to treatment, will not be discussed in this paper, which is primarily concerned with the surgical treatment and with a survey of cases so treated in the South Down Group of Hospitals.

In 1950 I reviewed the cases of diverticulitis of the colon admitted to the General Infirmary at Leeds over the previous five years (Greig, 1950). In dealing with the acute complications of the disease I strongly advocated conservative treatment with minimal palliative surgical intervention. This was in conformity with standard surgical teaching at that time, although as early as 1916 Telling and Gruner wrote that treatment ". . . is comprised in a single word—surgery." The reason surgical extirpation of the disease was not generally practised at that time was the high operative mortality—23 per cent. in Lockhart-Mummery's series (1938) and 21 per cent. in Arnheim's series (1940). However, as Smithwick (1942) pointed out, the survivors were cured of the disease whereas ill health and subsequent death from complications occurred in a large proportion of those patients treated conservatively, and in the past decade there has been a marked change in outlook with most surgeons now adopting a more radical approach. Colcock (1950), Bartlett and McDermott (1953) and Ryan (1958), among other authors, advocated resection for cases presenting with complications and also in those patients with recurring or persistent symptoms. The general acceptance of radical treatment has been due to the increasing knowledge of the management of fluid and electrolyte balance, the availability of various antibiotics to provide an aseptic surgical field, and, especially, the perfecting of the technique of low anastomosis in anterior resection for carcinoma of the sigmoid and upper rectum.

In the Leeds series already referred to seven cases were operated on in the five-year period 1945-49 and only one resection was done. Brown and Toomey (1960) review the cases admitted to the Western Infirmary, Glasgow, during the period 1945-56. There sixty-four cases were operated upon. Eleven cases had resection of the diseased colon with two deaths. These reviews were from large teaching hospitals and contrast strangely with the figures for the South Down Group of Hospitals (a small general surgical unit with one surgeon) where, in the period 1952-59 thirty-eight cases were operated on and seventeen resections done. Only one of the cases having radical resection died (5.9 per cent.).

Indications for Surgical Treatment.

Tables 1 and 2 show the indications for surgery in this series and the surgical treatment carried out.

TABLE 1.

Total Cases operated on 1952-59 = 38.

Indications for Surgery		Surgical Treatment		Deaths
General Peritonitis with or without obstruction - - -	11 ...	Laparotomy and Drainage only - - -	4	3
		Colostomy and Drainage -	7	Nil
Local Abscess - - -	2 ...	Laparotomy following conservative treatment -	2	Nil
Acute Obstruction—				
Large bowel - - -	3 ...	Immediate Resection -	2	Nil
		Colostomy - - -	1	Nil
Small bowel - - -	1 ...	Freeing of small bowel volvulus	1	Nil
Severe Urinary Infection - -	1 ...	Resection - - -	1	Nil
Recurring and Persistent Symptoms -	6 ...	Resection - - -	6	Nil
Pre-operative Diagnosis in doubt -	14 ...	Laparotomy - - -	11	Nil
		Resection - - -	3	Nil

TABLE 2.

Subsequent Treatment of Colostomy Cases.

Laparotomy and Closure of Colostomy - - - - -	2
Resection and later closure of Colostomy - - - - -	4
Resection. Died - - - - - - - -	1
Permanent Colostomy - - - - - - - -	1
Total - - - - - - - -	8

Acute Complications.

At present serious acute complications provide the commonest cause for the need for surgical treatment, but it is hoped that with the growing realisation of the safety of radical surgery in the treatment of cases with chronic or sub-acute symptoms the incidence will lessen, although perforation of a single diverticulum can occur with little or no previous disturbance.

(a) *General Peritonitis.*

General peritonitis may follow perforation of a single diverticulum, perforation above a stenosed area or rupture of a local abscess. Ryan (1958) strongly supports immediate resection in some of these cases, but it is felt that drainage, with divided colostomy, is all that should be attempted. The œdematous friable bowel wall, the disparity in size of proximal and distal loop in the presence of the frequently

accompanying obstruction, and the opening up of retroperitoneal areas to infection must add to the dangers in patients who are already seriously ill. Furthermore, as shown in Table 2, two cases who had peritonitis treated by colostomy and drainage were found subsequently to have minimal evidence of diverticulitis and no stenosis. At laparotomy resection was not considered necessary and closure of the colostomy was done. They are alive and well six years and six months afterwards.

Laparotomy and drainage alone as a method of treatment is to be condemned. In Brown and Toomey's series there was a 50 per cent. mortality and in the present series three of the four cases died—two within forty-eight hours of operation. They occurred in the early years under review and it is felt that, although desperately ill, the addition of a defunctioning colostomy and more vigorous treatment of the water and electrolyte balance might have been effective. The one patient who did survive refused further treatment.

(b) *Local Abscess.*

Local abscess formation without obstruction must be differentiated from the tender palpable colon of the case of sub-acute diverticulitis. Only two cases were seen in this series and with conservative treatment they resolved satisfac-factorily. Both were situated in the left iliac fossa and one extended into the left loin. Following the subsidence of symptoms laparotomy showed only a local area of diverticulitis without stenosis and resection was not done. The wisdom of this is in doubt because one case has had subsequent trouble and will probably require resection. It is considered therefore that cases with generalised peritonitis, cases of local peritonitis or abscess associated with obstructive symptoms should be treated by local drainage and colostomy. The colostomy should be a divided colostomy to rest completely the diseased bowel and should be made in the transverse colon to the right of the middle colic artery to facilitate any subsequent mobilisation of the distal colon. In two to three months, if the patient's general condition permits it, a further operation for resection of the diseased bowel and end-to-end anastomosis should be carried out. Rarely, if the disease is minimal, closure of the colostomy may be all that is needed.

(c) *Acute Obstruction.*

Some degree of obstruction is common in diverticulitis but acute obstruction without peritonitis is not very common. Three cases of acute large bowel obstruction have been seen. In one of these the obstructing factor was a gall-stone impacted in the very narrowed sigmoid colon. Immediate resection with end-to-end anastomosis was done in this case. A Paul's resection was done in one other case and a colostomy only in the third. Although both these cases treated by immediate resection recovered, a staged procedure is probably safer with a transverse colostomy as the first stage. This applies especially if much fluid has been lost into distended bowel or by vomiting. Resection of an extensive area of "diverticulitic" colon can be a difficult operation and the patient should be made as fit as possible before it is done.

Small bowel obstruction due to adhesion of small intestine to an area of diverticulitis is a recognised complication. One example was met in this series with volvulus of a loop of ileum, the apex of which was easily separated from the inflamed colon. Further surgical treatment of the causative disease was not pressed because of the patient's poor general condition.

(d) *Fistula.*

Colo-vesical, entero-colic, external, and even colo-vaginal fistulæ are described but no case has been seen in this series. One case, however, did present as a severe intractable cystitis. A big tender mass continuous with the bladder was felt in the left iliac fossa. Although he had no bowel upset this was found to be a grossly inflamed peridivarticular mass. Resection with end-to-end anastomosis resulted in resolution of his cystitis and return to normal of the bladder mucosa as seen on cystoscopy.

Recurring and Persistent Symptoms.

Diverticulitis is a disease of the older age groups (average age in this series, 62 years; youngest, 38) but the serious results of the inevitable consequences of progressive diverticulitis must be considered. Cure follows resection of the diseased area of bowel and should be considered in all cases where medical measures fail to bring relief, especially if there are recurring attacks of subacute obstruction. Bleeding, although not a common symptom in diverticulitis, may at times be severe and recurring. One of the cases in this series had repeated mild hæmorrhages and subacute obstructive symptoms. The other five had mild obstructive symptoms, persistent pain and tenderness in the left iliac fossa and recurring ill health. Resection brought relief in all cases. The average age in this group was 56.

Pre-operative Doubt in Diagnosis.

The clinical features of diverticulitis may closely mimic those of carcinoma. As Brown and Toomey point out, sigmoidoscopy is rarely of help in the differentiation but exfoliative cytological studies by an expert in this method of diagnosis might help. In the eight-year period under review fourteen cases showed diverticulitis on barium enema examination but the possibility of associated carcinoma could not be excluded. Even at operation in one case the diagnosis was not certain and an anterior resection was done. In two other cases which were recognised as non-malignant but where there had previously been attacks of obstruction a radical resection was done. In the other eleven cases, apart from the freeing of any adhesion or kinked sigmoid loop, nothing was done. As with those patients subjected to laparotomy following local abscess formation the wisdom of this is in doubt because of persistent symptoms in several instances and resection would be considered more seriously in future cases in this group.

Surgical Technique and Pre-operative Treatment.

Diverticulitis may affect any or all of the colon. Fortunately the sigmoid is the most commonly affected site, and even though diverticulosis may extend

round the colon diverticulitis rarely extends proximal to the splenic flexure. Ryan (1958) suggests that all the "diverticulotic" area (as opposed to the "diverticulitic" area) should be resected but the author's practice is to remove the "diverticulitic" area with any adjacent area containing many diverticula. In fact, at operation during a quiescent phase (and operation at any other time is not advisable), the differentiation may be impossible. In the present series the sigmoid and lower descending colon has been removed in fifteen cases. In only two cases was mobilisation up to the splenic flexure required. The operation may or may not be made difficult by pericolonic inflammation and adhesions (a ureteric catheter in the left ureter may sometimes save the surgeon much worry) but the absence of the need to remove the lymphatic drainage area makes it easier. Mobilisation of a proximal segment with adequate blood supply is also easier than in comparable resections for carcinoma. Following resection and end-to-end anastomisis (done through a long paramedian incision) drainage of the area of the anastomosis should be made—the drain ideally running extra-peritoneally and brought out in the flank. Some fæcal drainage occurred in three cases in this series but cleared spontaneously.

The pre-operative treatment of the "cold" case should be the same as prior to resection for carcinoma (the author's preference at the moment has swung back to the original "St. Marks" treatment—wash-outs, topical sulphonamides and vitamin replacement). In the pre-operative treatment of the cases which have had preliminary colostomy efficient cleaning-out of the de-functioned distal colon is considered essential, especially if radiography after barium enema (done in all cases) shows blockage. In these cases repeated wash-outs through the colostomy opening, in addition to rectal wash-outs, are needed. The only death after resection in this series was from peritonitis following breakdown of the anastomosis and was due to inadequate pre-operative preparation. The colon was found to be full of hard fæces at operation and some were spilled into the opened peritoneum when a clamp slipped. Even so, hard inspissated fæcal matter will be found in the diverticula and for this reason streptomycin is given parenterally for the day before and four or five days after operation.

Summary.

The surgical treatment of diverticulitis of the colon in a small surgical unit over the period 1952-1959 is reviewed. Although the numbers are relatively small, it is considered that the following points emerge:—

(1) The treatment of serious acute complications should be by colostomy with drainage if peritonitis is present.

(2) Resection of the diseased bowel and closure of the colostomy is the ideal and safe subsequent procedure in these cases.

(3) Although the treatment initially of the non-acute cases is by medical means radical surgical treatment should be practised in those with recurring and and persistent symptoms, providing the general condition of the patient does not preclude it.

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REVIEW

ST. PETER'S HOSPITAL FOR STONE 1860-1960. Edited by Clifford Morson, O.B.E., F.R.C.S. (Pp. viii + 64; figs. 18. 21s.) Edinburgh and London: E. & S. Livingstone, 1960.

When people know and love an institution any book describing it will be read by them with uncritical delight. The many friends of St. Peter's Hospital for Stone are to be envied in their reading of this book where every page shows the authors' joy in their task. A stranger reading the book tends to be more critical, but in this case the sheer ability of the writers as historians and their lovable habit of laughing at the institution and its characters make the reader feel that he is a welcome visitor at their hospital.

The history of the hospital in relation to the changing times is described by Cuthbert Dukes who was its pathologist from 1929-55.

The chapter on the management committee is all too short and the description of the old Hospital Secretary leaves the reader wanting more.

The deceased members of the consultant staff are described with an affection which does not attempt to conceal their weaknesses. In fact, this chapter is an excellent critical appraisal of the value of the life's work of each member of the consultant staff.

The chapter which gives most insight into the early days of the hospital is the description of the nursing staff with its quick succession of matrons at £30 per annum and £3. 15s. beer money.

The reviewer read this book with much too great interest to be able to produce any criticism.

The wisdom of the Board of Governors of St. Peter's, St. Paul's and St. Philip's in financing the publication from endowment funds should be copied by other institutions.

As usual the publishers (Livingstone) have left no room for criticism. S. V.

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ACUTE PUERPERAL INVERSION OF THE UTERUS

REPORT OF A CASE

By **T. WILSON RODDIE**
Obstetrician, Lagan Valley Hospital, Lisburn

and **DAVID H. WARDEN**
General Practitioner, Lisburn

ACUTE puerperal inversion of the uterus is a rare event and the frequency is controversial. Reports range from no cases in 250,000 to one in 3,000 deliveries.

Two reasons for reporting this case are well described by Cosgrove (1939). He says: "First, it has been well said that no man has seen enough of these cases to know very much, of his own knowledge, about them. Hence, a few more cases detailed and analysed, with suitable expression of tendencies towards conclusions derivable therefrom, may still have value. Second all truth, no matter how thoroughly known to the leaders of medical thought, must be reiterated again and again before it becomes so thoroughly impressed on the rank and file of practitioners as to be available for the benefit of all patients."

CASE REPORT.

The patient was a primipara aged 25 years and married eighteen months. The ante-natal period was uneventful and labour commenced spontaneously at term. On admission to hospital her general condition was good and labour progressed normally under routine sedation of seconal and pethidine. She was ten hours in the first stage of labour and after, approximately, one hour in the second stage the head was on the perineum. A low forcep delivery was performed under cyclopropane anæsthesia delivering her of a living male child weighing 7 lb. 14 oz. (3566 G.). An episiotomy was necessary. The placenta separated and was expressed normally ten minutes after delivery. The estimated blood loss was recorded as being 20 fl. oz. (570 ml.). At this stage her condition was quite satisfactory and her blood pressure and pulse rate were normal. However, within half an hour her pulse rate started to rise and her blood pressure to fall. She was not bleeding excessively but complained of abdominal pain. It was obvious that a state of shock was developing so the foot of the bed was raised, morphia was given by injection and blood transfusion commenced. One pint was given fairly quickly but her condition was no better. After two more pints of blood it was clear that something was radically amiss and inversion of the uterus was considered with rupture of the uterus, hæmorrhage and the like. At this time, about two hours since delivery, what felt like a firmly contracted fundus uteri was palpable in the abdomen in the position where a normal puerperal fundus ought to be. Also there was serious vaginal blood loss. A vaginal examination was now made and the condition of inversion easily diagnosed by feeling the inverted fundus

filling the uterine cavity and presenting at the cervix. As the condition of the patient was now so critical, and the invaginated fundus of the uterus seemed so tightly grasped in this position, it was felt that attempts to replace it vaginally would only aggravate the acute shock and produce a condition so severe that it became irreversible. Therefore the decision to perform a laparotomy and attempt abdominal replacement was made. It is interesting to record that, even at this stage, the apparent fundus level was just slightly below the umbilicus though a distinct dimple or depression could now be felt. Vaginal bleeding was still not a dramatic sign.

On opening the abdomen through a midline subumbilical incision a pallid uterus was seen with the tubes, ovaries and round ligaments drawn tightly up to the crater of the inversion funnel. Grasping the uterine mass with two hands over the apparent 'fundus' and with the thumbs over the foremost portion of the inversion kneading manipulations gradually corrected the invaginated uterus. When this was completed it was interesting to note the dramatic improvement in the patient's condition and the change in colour of the uterus. Her improvement continued and the abdomen was closed. Blood transfusion was continued throughout and after the operation and in all she was given six pints (3,420 ml.). Intravenous and intramuscular cortisone were also administered. The anæsthesia given for the operation by Dr. A. A. Miller, M.B.E., M.B., F.F.A.R.C.S., was as follows:—Inhalation of pure oxygen for several minutes followed by intravenous injection of 100 mg. thiopentone (4 ml. of 2.5 per cent. solution) and 40 mgm. of scoline. She was intubated with a cuffed tube after inflation with oxygen and the anæsthetic was maintained with 1 per cent. fluothane in oxygen, as delivered by the fluothane vaporiser, and using carbon dioxide absorption. Controlled respiration was used until after the inversion was corrected and then the patient was allowed to breathe normally.

Antibiotic therapy was instituted after operation and her convalescence was uneventful. She was discharged from hospital on the ninth day of the puerperium.

Comment.

Inversion of the uterus is a serious postpartum complication with a high death rate. Although mismanagement of the third stage can be an important causal factor, Easterday and Reid (1959) state that at least 40 per cent. of cases occur where the placental stage has been perfectly normal. Henderson and Alles (1948), in a review of twenty-four cases, noted a high incidence of the condition in primiparas and suggested that in certain patients there is a predisposition to inversion. However, some abnormality in uterine muscle tone must develop to permit the invagination to begin. A depression starts, the rim around it contracts and forces the introcedent wall downwards and more deeply into the uterine cavity. The rest of the uterus seizes this invaginated portion and, in attempting to expel it, turns itself inside out. The pain and shock are due to the ovaries being crushed together or dragged forcibly against the brim of the depression with marked tension on the tubo-ovarian ligaments. This acute shock is a fortuitous occurrence and hæmorrhage is another important sign. Nevertheless they may

occur separately and in the present case hæmorrhage was never the predominant sign.

De Lee and Greenhill (1947) state, with reference to the diagnosis of acute inversion: "If the physician bears this accident in mind, there need be no difficulty in making the diagnosis on direct examination. A large, round tumour in the vagina, with absence of the corpus from its proper place in the presence of shock and hæmorrhage, will clear up the situation at once." This is no doubt true but it is a late diagnosis. In the case reported the uterine fundus seemed palpable in a normal position even when the patient's condition was extremely grave. Henderson and Alles (1948) stress this point and say: "The findings on abdominal examination are unreliable because the inverted fundus is in the normal position in the pelvis, and if the examination is careless or if the abdominal wall is thick, the characteristic dimpling of the uterine tumour is not noted."

It is therefore suggested that early vaginal examination is of the utmost importance in all cases of postpartum hæmorrhage, with or without shock. Early diagnosis should make it possible for the inversion to be corrected by vaginal manipulations. When recognition is delayed attempts at vaginal replacement often fail and the combination of surgical trauma, blood loss and shock will produce a condition so severe that it becomes irreversible despite adequate resuscitative measures. It is not an obstetric triumph to successfully correct the inversion by vaginal manipulations at the expense of the patient's life. Therefore in cases like the one described preference must be for abdominal reposition because of the readiness by which the uterus can be replaced with almost instantaneous disappearance of the shock. This view is supported by Findley (1929).

Summary.

A case of acute puerperal inversion in a primipara, successfully corrected by abdominal operation, is described. Problems in diagnosis are briefly discussed and it is reiterated that all cases of abnormal postpartum shock and hæmorrhage should be immediately examined vaginally to exclude acute inversion.

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THE RESULTS OF SURGICAL REPAIR OF ATRIAL SEPTAL DEFECT

By G. C. PATTERSON, M.D.,
Registrar in Cardiology, Royal Victoria Hospital, Belfast

and B. S. L. KIDD, M.D., M.R.C.P.E.,
Registrar in Pædiatric Cardiology, Royal Belfast Hospital for Sick Children

ALTHOUGH atrial septal defect is one of the commonest of the congenital heart lesions, and the anatomical features have been recognised since the early nineteenth century, it is only in the last thirty years that a clearly defined clinical picture has emerged (Roesler, 1934; Bedford Papp and Parkinson, 1941). Precision in diagnosis came with the use of cardiac catheterization (Wood, 1950; Dexter, 1956).

With advance in diagnosis, methods of surgical correction were sought, and various "closed" operations—either distortion by external sutures or suturing of the free atrial wall to the edges of the defect—were proposed and achieved some popularity (Bailey et al., 1953). Gross (1952) repaired the defect at the bottom of an atrial well filled with blood, and this method is still in use. It became clear, however, that a method in which the defect could be seen and repaired under direct vision was infinitely preferable, and following the introduction of hypothermia—a procedure allowing circulatory arrest of up to ten minutes—Lewis and Taufic (1953) reported the first successful closure of an atrial septal defect under direct vision. Subsequently this method passed into general use and reports from various centres have described the results and discussed the problems of the procedure (Swan et al., 1953; Blount et al., 1956).

Among the 383 cases of congenital heart disease from the Cardiac Clinics of the Royal Belfast Hospital for Sick Children and the Royal Victoria Hospital, Belfast, which have been investigated in the Cardiac Catheterization Unit in the Royal Victoria Hospital there have been one hundred cases of atrial septal defect. Of these, forty have been submitted to operation. This paper describes the clinical features, the findings on investigation, the findings at operation, the complications, and the post-operative assessment of these forty cases. There were three operative deaths and one post-operative death in the series.

CLINICAL FEATURES AND INVESTIGATIONS.

Age and Sex.

The age at the time of operation varied between 2 years and 49 years, but the majority were submitted to surgery between the ages of 6 and 20 years. There were sixteen males and twenty-four females.

Presenting Symptoms.

These were varied and occasionally slight. Nineteen patients complained of shortness of breath; four had repeated chest infections; three were cyanosed and

four patients were in congestive heart failure. Two children were referred because of murmurs noted in the neonatal period and two because of failure to thrive.

Physical Signs.

All cases had the typical systolic pulmonary ejection murmur, and in all but one case it was noted that the second sound in the pulmonary area was widely split, and that the splitting did not vary with respiration. In five cases an early diastolic murmur was heard at the left sternal margin and two had a mid-diastolic murmur inside the apex.

Radiography.

The characteristic features of atrial septal defect—a large pulmonary conus with increased hilar vascularity—were noted in thirty-nine of the forty cases submitted to surgery. One case with associated high grade pulmonary valvular stenosis had normal pulmonary vascularity.

Electrocardiography.

In the present series twenty-six cases (65 per cent.) showed the rSR pattern without lengthening of the QRS complex, described as "incomplete right bundle branch block," four had complete right bundle branch block (age 9, 16, 17, and 20 years) while nine had records indicating right ventricular hypertrophy. One record was normal. None of the patients submitted to operation had left axis shift.

Cardiac Catheterization.

All patients were catheterized in the Cardiac Catheterization Unit of the Royal Victoria Hospital. This was carried out under local anæsthesia in all but fourteen cases who were under 10 years of age and in whom light general anæsthesia was maintained.

Blood samples were obtained from the pulmonary artery, right ventricle, right atrium, superior and inferior venæ cavæ and femoral artery. A shunt from left to right at the atrial level was present in all cases and was calculated as described by Cournand et al. (1949) and expressed as a percentage of the pulmonary blood flow. The size of the shunt varied from 29 per cent. to 77 per cent. In three cases the shunt was bidirectional; two of these had associated pulmonary valvular stenosis and one a low defect near the mouth of the inferior vena cava. Pressures were recorded by a strain-gauge electro-manometer during withdrawal of the catheter tip from the pulmonary artery to the right atrium in thirty-six cases. In two cases the pulmonary artery mean pressure was measured by a saline manometer and found to be normal. The pulmonary artery pressures ranged from 54/10 to 10/7 mms. Hg.: in one case the catheter tip could not be passed into the pulmonary artery, and in one case it could not be introduced into the right ventricle.

In two cases during the withdrawal of the catheter tip from the pulmonary artery to the right ventricle there was an abrupt rise in systolic pressure at the pulmonary valve of 105 and 100 mms. Hg. respectively, indicating coincident pulmonary valvular stenosis.

In many patients the catheter was passed from the right auricle through the atrial septal defect into the left atrium.

Dye Curves.

In pre-operative assessment efforts were made to predict the presence of anomalous pulmonary venous drainage. Re-direction of anomalous veins into the left atrium may require a relatively long period of circulatory arrest necessitating cardio-pulmonary bypass. The presence of one or more anomalously draining pulmonary veins from the right lung may be detected by seeing the catheter pass into a pulmonary vein directly from the right atrium or superior vena cava.

Anomalous venous drainage may be suggested by dye dilution records. Normally when dye is injected rapidly into the pulmonary artery the dye concentration recorded in the systemic circulation by means of an earpiece oximeter shows a steep rise, followed by a rapid fall and then a further rise due to recirculation. The pattern is similar whether the dye is injected into the right or the left pulmonary artery. When a left to right shunt is present the peak dye concentration is lower and the subsequent decrease is much slower.

The anatomical relation of the normal right pulmonary veins to an atrial septal defect frequently results in a larger proportion of the blood from the right lung crossing the defect than that from the left lung. Hence in the presence of an atrial septal defect dye curves obtained following injection into the right and left pulmonary arteries may differ somewhat. However, when an atrial septal defect is complicated by anomalous pulmonary venous drainage marked differences in records are apparent.

Operation.

Procedure.

All patients were cooled by immersion of the whole body in a bath at 10° C. after induction of anæsthesia. Body temperature was monitored by an œsophageal thermocouple. The patient was removed from the bath as the œsophageal temperature fell to 34° or 32° depending on the amount of body fat. The after-drop usually ensured that the body temperature was at 30—31° C. at the time when circulatory arrest was desired. Since cardiac irregularities are frequent at temperatures below 28° C., care was taken to ensure that hypothermia did not reach that level. At 30° C. lowered cerebral metabolism allows arrest of the circulation for eight to ten minutes without cerebral damage.

Temperature at Time of Arrest.

In the present series the œsophageal temperature at the time of arrest ranged from 28° C.—32° C., with a mean of 30.3° C.

Duration of Arrest.

Circulatory arrest lasted from 4 to 8½ minutes with a mean time of 5 minutes. In the two cases with associated pulmonary valvular stenosis, pulmonary valvotomy was carried out first with a circulatory arrest of 3½ and 2½ minutes respectively. The circulation was re-established. A further period of circulatory

arrest some minutes later allowed closure of the atrial septal defect. In another case an anomalous pulmonary vein was found and this was directed into the left atrium, so prolonging the period of arrest to nine minutes.

Arrhythmia.

Rhythm disturbances during the operation were usually transitory and had reverted before chest closure. Atrial fibrillation was common and varying degrees of atrio-ventricular dissociation were seen. In three cases ventricular fibrillation occurred and required electrical defibrillation.

Operative Fatalities.

Case 11 was a 6-year-old boy whose parents were perturbed because of attacks of cyanosis and who had electrocardiographic evidence of marked right ventricular hypertrophy and radiological evidence of gross increase in hilar vascularity. Cardiac catheterization showed a shunt of 61 per cent. of pulmonary blood flow. The catheter could not be passed into the right ventricle. At operation a very large defect was present. The septal wall was not recognised, and the coronary sinus was closed. This led to cardiac arrest and despite removal of the sutures, cardiac action could not be restored.

Case 13 was a cyanosed girl of 2 years who had been in congestive heart failure. She had incomplete right bundle branch block, a shunt of 34 per cent. of the pulmonary blood flow and a right ventricular systolic pressure of 54 mm. Hg. The defect was of the inferior type and was successfully closed. Cardiac arrest occurred immediately afterwards and progressed to ventricular fibrillation. Normal heart action could not be restored.

Case 25 was a 6-year-old girl with exertional dyspnœa. She had marked right ventricular hypertrophy on the electrocardiogram, marked increase in hilar vascularity in the X-ray of the chest, a shunt of 60 per cent. of the pulmonary blood flow, and a normal pulmonary artery pressure. At operation a central defect was repaired at a body temperature of 31° C. and with circulatory arrest for 5½ minutes. At the conclusion of the operation the heart, formerly in normal sinus rhythm, stopped. The wound was reopened, cardiac massage instituted and normal cardiac action restored. She was returned to the ward. Cardiac arrest recurred some two hours later, which massage could not correct. At post-mortem, in addition to the closed central defect a sinus venosus defect (vide infra) was discovered.

Type of Defect.

Septum secundum defect is the commonest variety of atrial septal defect, and is caused by maldevelopment of the septum secundum, usually in its upper part. It must be distinguished from septum primum defect caused by malfusion of the septum primum with the atrio-ventricular septum. Septum primum is usually associated with a cleft in the mural cusp of the mitral valve and a defect in the membranous part of the inter-ventricular septum. This defect is too complex to repair in under ten minutes and no such cases are submitted to surgery under hypothermia. Septum primum is usually associated with left axis shift on the electrocardiogram.

All cases in the present series had defects of the septum secundum type.

Four varieties of secundum defect were encountered:—(i) Central, with the defect in the foramen ovale position, (ii) inferior, with the defect extending down to the mouth of the inferior vena cava, (iii) posterior, with no posterior septal rim, and (iv) sinus venosus defect, where the defect is high near the superior vena cava. In the present series there were thirty central defects, seven inferior defects, and two posterior defects. One case (No. 25) had a sinus venosus defect in addition to a central defect and one (No. 11) had almost an atrium communis.

Post-operative Period.

Both pleural cavities were drained with tubes leading to underwater seals. After twenty-four hours all bleeding having ceased, the drains were removed. Prophylactic penicillin and streptomycin were administered to all patients. Intensive physiotherapy, both before and after the operation, was employed because of difficulty with ventilation and coughing due to the extensive incision in the chest. The post-operative period was uneventful in the large majority of cases, although a few had mild chest infection. There was one post-operative death.

Case 8 was a 48-year-old mentally deranged woman who had been in right heart failure. The electrocardiogram showed incomplete right bundle branch block and the X-ray chest gross increase in hilar vascularity. The calculated shunt was 43 per cent. of the pulmonary blood flow and the pulmonary artery pressure 28/10 mms. Hg. A central-type defect was repaired easily in four minutes at 30.5° C. Following the operation she became catatonic. Poor pulmonary ventilation led to chest infection. Tracheotomy was carried out and bronchial aspiration was performed but death occurred on the sixth post-operative day.

Post-operative Assessment.

The thirty-six surviving cases have now been followed up for periods of between one month and two years. All have reported relief of their symptoms and a marked improvement in their health. Many have noted a decreased frequency of chest infections formerly a prominent feature of their condition. A number of the children have grown at increased rates. The two patients who were in congestive heart failure are now well.

Occasionally it may be difficult to be certain that the defect is completely closed, since in some cases the pulmonary murmur persists, presumably due to delayed regression of the dilated pulmonary trunk. Electrocardiographic signs may be slow in resolving and comparison of the pre- and immediately post-operative chest films is not always of value in assessing closure of the defect.

The change from fixed splitting of the pulmonary second sound pre-operatively to mobile splitting post-operatively is useful evidence of closure. Prior to operation the splitting of the second heart sound does not vary with respiration due to persistent overfilling of the right heart by blood from the left atrium through the atrial defect. Post-operative increased splitting on inspiration is due to an increase in right heart filling during this phase of respiration.

Discussion.

The efficacy of any operative procedure must be determined by comparison of the results in patients so treated with those in patients who have not had

surgery. Campbell Neill and Suzman (1958) have studied patients with atrial septal defect who had not had surgical closure. They showed that the number of cases who were in trouble or who had died rose slowly in the early decades of life, more rapidly in the 30 to 40 year age group and that by 40 to 50 years of age the large majority were dead, in congestive heart failure, or had developed pulmonary hypertension with reversal of the shunt (Eisenmenger syndrome). They concluded that the appearance of atrial fibrillation or congestive cardiac failure were associated with a very poor prognosis, death usually occurring within two years.

It is obviously impossible at this stage to obtain a comparable follow-up study to assess a method of treatment so recently introduced in a disease which runs such a long and variable course. However, it is reasonable to assume that operative closure will be beneficial and the study of Campbell et al. suggests that the procedure should be carried out early in the course of the disease.

In the present series of patients there were three operative deaths (7.5 per cent.). It should be noted that in one case death was due to coronary sinus closure, in one case a sinus venosus defect was not closed, and that the third was a poor risk, a child of two years who had been in congestive heart failure. There have been no operative deaths in the last fifteen cases.

We suggest that all septum secundum defects of appreciable size should have surgical repair before serious cardiac embarrassment has occurred.

Summary.

Forty patients with atrial septal defect of the septum secundum type have had surgical closure of the defect.

The pre-operative, operative, and post-operative findings are described.

In view of the relatively low operative mortality and the poor prognosis in the uncorrected case, early surgical repair is advised in selected cases.

Acknowledgments.

The patients were under the care of Dr. J. F. Pantridge. The operations were performed by Mr. J. A. W. Bingham, Mr. H. M. Stevenson, and Mr. T. B. Smiley.

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BIZARRE PRESENTATION OF TÆNIA SAGINTA IN A T-TUBE DRAINING THE COMMON BILE DUCT

By C. J. H. LOGAN, M.B., B.Ch.

Lately Senior House Officer, Royal Victoria Hospital, Belfast

IN surgical practice today one rarely sees patients with tapeworm infestations, but the case reported below is unique in that the worm was found to lie in a T-tube draining the common bile duct.

CASE REPORT.

A female patient, aged 69, was admitted as an emergency with a twenty-four hour history of abdominal pain accompanied by vomiting. The pain was aching in character, maximal in the epigastrium and radiated into her back. This was relieved only by leaning forwards in bed. The vomiting had been constant since the onset of the pain. The patient had suffered two or three similar attacks previously, but these had not been so severe.

Although pale, there were no signs of anæmia or jaundice. Abdominal examination revealed generalized rigidity and tenderness, but there was no rebound tenderness nor loss of liver dullness.

A clinical diagnosis of acute pancreatitis was made and confirmed by the emergency estimation of the serum amylase, which was found to be "greater than 350 Somogyi units." Treatment was by intravenous infusion, gastric suction, penicillin and streptomycin, and analgesics. The patient's general condition rapidly improved and her pain subsided, but she continued to run a slight evening pyrexia and the serum amylase level remained elevated.

During this stage of her convalescence it was noted that her stools frequently contained segments of tapeworm but it was decided to postpone immediate treatment for this despite the fact that the head of the worm had not been passed.

A cholecystogram, carried out thirty days after admission, showed that the gall bladder contained numerous small calculi and a laparotomy was performed ten days after cholecystography. At operation the pancreas was found to be grossly thickened and hard; there was dilatation of the common bile duct and both this and the gall bladder contained numerous small stones. The gall bladder was removed and fifty-one small pigmented stones were removed from the common bile duct. When no further stones could be seen on the cholangiogram or felt in the common bile duct, the duodenum was opened and the sphincter of Oddi divided. No abnormality was noted in the duodenum. The duodenum was closed and a T-tube drain inserted in the common bile duct, the end being brought through a stab wound in the right hypochondrium.

The day after operation the serum amylase level was within normal limits, but despite gastric suction and intravenous infusion paralytic ileus developed. This persisted for forty-eight hours and there was no further upset during convalescence. On the tenth post-operative day a T-tube cholangiogram was performed. This showed no abnormality in the common bile duct, but the dye did not enter the duodenal end of the T-tube. It was decided to remove the T-tube and when this was withdrawn from the wound a live tapeworm was seen to extend from the wound into the duodenal end of the T-tube. Approximately two feet six inches (76.2 cms.) of worm was then withdrawn from the wound,

the head emerging last. The worm was identified as *Tænia saginata*, microscopic examination of the head showing the typical arrangement of the suckers. By splitting open the T-tube the tail was seen to extend into the vertical limb.

Comment.

No exactly similar case can be found in the literature, but Benedict (1926) and Ardao and Praderi (1954) describe two cases with symptoms suggestive of acute cholecystitis who were found at operation to have tapeworms (*Tænia saginata*) in the gall bladder. Ardao's case shows some similarity to the one described in that 9.16 feet (2.8 meters) were withdrawn from the fundus of the gall bladder, yet the head was not found. Exploration of the hepatic and common bile ducts, after removal of the worm, did not reveal the presence of the head nor any segments. Furthermore, half of the worm was stained green while the remainder was a normal colour. These facts would suggest that the tail end of the worm had entered the gall bladder via the common bile duct, while the head remained in the intestine. The example described above would confirm this.

The tapeworm normally inhabits the small intestine with its head fixed proximally in the jejunum and the tail extending into the ileum. In the present case a number of factors appear to be instrumental in dislodging the head from its intestinal attachment. In the first place there was considerable handling of the small intestine at operation, and secondly, there was a period of post-operative paralytic ileus. It must be presumed that the larger orifice and lack of sphincteric closure after the sphincterotomy afforded entry of the tail of the worm into the common bile duct. Perhaps the dilatation of the common bile duct which was present played a part, as in Ardao's case post-operative cholangiography also showed the common bile duct to be dilated.

I wish to thank Mr. T. L. Kennedy for his permission to publish this case, and Professor W. E. Kershaw and Dr. T. Wilson of the Liverpool School of Tropical Medicine for their help and advice.

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PSYCHIATRIC ASPECTS OF BRONCHIAL ASTHMA

A CRITICAL REVIEW AND CASE REPORTS

By S. J. KNOX, M.B., D.P.M.

Department of Mental Health, Queen's University, Belfast

SOMATIC illnesses are accompanied by psychological reactions in major or minor form, varying according to the nature and severity of the disorder, the age, sex, personality structure and intelligence of the patient. Moreover, emotional experiences are known to have somatic concomitants and consequently a psychic disturbance may be expressed through physical symptoms. For example, it is widely accepted that psychiatric factors are of fundamental significance in many cases of bronchial asthma and the object of this review is to explore the rôle of such factors in the disorder. Although this paper will deal primarily with the psychiatric aspects of asthma, it is not to be regarded as supporting the concept of monocausality. Allergic factors have been shown to be important in many cases and Stockvis (1959) remarks that "allergy is invariably present in genuine asthmatic attacks, however prominent the psychic determinant might be." He quotes the findings of Hanhart, who demonstrated the presence of sensitivity to allergens in 92 per cent. of 1,200 asthmatic patients studied.

HEREDITY AND ASTHMA.

In a comprehensive and painstaking investigation Schwartz (1952) reviewed this subject and reported a clinical and genetic study of 191 asthma probands. He concluded that asthma is an inherited disorder having a genetic relationship with vasomotor rhinitis, Besnier's prurigo and hay fever. Considering the incidence of asthma in the general population he suggested that there is possibly recessive in addition to dominant inheritance, but that the most likely mode of transmission is dominant heredity with failing manifestation. The degree of manifestation of the "asthma gene" was given as about 40 per cent.

Other studies have devoted more attention to the incidence of psychiatric disorder in asthmatic families. McDermott and Cobb (1939) investigated fifty asthmatic patients and thirty of the group were regarded as having "emotional factors" in their illness. It was found that in the near relatives of 47 per cent. of this sub-group there were indications of "unusual behaviour, hospitalisation in mental institutions or marked emotional instability." However, of the twenty patients in whom emotional factors were not evident only 15 per cent. had a positive family history of psychiatric disorder. Leigh (1953) studied fifty asthmatics, the group being highly selected in that all had been referred to a psychiatrist. Two-thirds of his subjects gave a family history of allergy and in just over 50 per cent. one or more near relatives had had either a neurosis or psychosis.

The "Asthmatic Personality."

It has been postulated that certain disease processes are more likely to occur in persons having a characteristic personality structure. Russek (1958), for example, has reported that young persons suffering from coronary thrombosis have, amongst other personality traits, an intense desire for recognition and are rigid, meticulous, and over-worked, whilst not appreciating their own limitations. Again, many authors have attempted to delineate a specific personality profile in patients with bronchial asthma. However, personality testing is a controversial subject and the validity of those tests commonly employed clinically at present has been questioned. Their critics have pointed out that little or no attempt has been made to use statistical method and highly subjective test materials are employed.

The concept of specificity of personality in psychosomatic disorders is supported by some workers and rejected by others. The protagonists of this theory suggest that asthma occurs in individuals with a common and distinctive core in their personality structure. They contend that the various traits which constitute the asthmatic personality core are not in themselves specific and are evident in patients with other psychosomatic disorders, but it is argued that they are present here in a precise and unique proportion (Bastiaans and Groen, 1955). Gillespie (1936) commented "asthmatics exhibit what would be called a neurotic type of personality long before an asthmatic attack began." Rogerson (1937) investigated a group of thirty children suffering from the "asthma-eczema-prurigo" syndrome and was impressed by the fact that many were over-anxious, lacked self-confidence and had aggressive characteristics. In their environment he found over-protection and over-anxiety with "thwarting" and "limiting" factors. McDermott and Cobb (1939) commented on exaggerated orderliness whilst Brown and Goiten (1943) found asthmatics to be of a "cyclothymic disposition associated with paranoid features, repressed hostility and self-punishment motives." Trueting and Ripley (1948) described the asthmatic as immature, seclusive, and the predominant mood was one of depression.

It is difficult to recognise any common denominator in these personality profiles and it would seem inappropriate to base a description of the pre-morbid personality on tests performed after the illness has been established. Furthermore, in many studies the selection of patients has been biased and hypotheses which may apply to cases referred to psychiatrists do not necessarily pertain to asthmatics generally. Leigh (1956), reporting on a group of 150 asthmatics followed up for seven years, concluded that "the only personality core common to the group was probably the result of the asthma itself." More recently Franks and Leigh (1959), working within Eysenck's concept in which personality is described in terms of introversion—extraversion and neuroticism, studied four groups, each of twenty subjects—in-patient neurotics, out-patient neurotics, asthmatics and normals. None of the groups differed significantly on the introversion-extraversion scale of the Maudsley Personality Inventory, but there was a "marked tendency for the asthmatics to occupy a position intermediate between" neurotics and normals on the neuroticism scale. This confirmed the impression that asthmatics

had a mildly neurotic personality and they suggested that this common core of neuroticism is probably secondary to the dysfunction itself.

This tends to be supported by the few reports regarding the kind of psychiatric symptoms occurring during or between asthmatic attacks. Trueting and Ripley (1948) concluded that depression occurred in almost all patients during attacks and in 60 per cent. of their 51 patients anxiety was a prominent feature. Leigh (1953) described "neurotic symptoms" in addition to asthmatic attacks in 80 per cent. of his patients. Moreover, 90 per cent. were prone to severe depressive episodes and one-sixth of the group were admitted to a psychiatric hospital on account of this mood disturbance. In a more recent report Knapp and Nemetz (1960) reviewed clinically and retrospectively 406 asthmatic attacks occurring in a group of patients with severe, chronic bronchial asthma. They studied the feelings and fantasies accompanying the attacks and also the antecedent events in the 48-hour period prior to onset. In the prodromal phase there were no evident feelings or fantasies in 48 per cent. of cases. In the remainder a variety of emotional manifestations preceded and lead directly into acute asthma, the most prominent of these being fear, irritability and excitement. Before the attack had become established there was a sense of sadness, helplessness and hopelessness and during it the patient was absorbed in the physical illness. In 6 per cent. of cases there were fantasies of dangerous or poisonous substances within the body.

The Precipitation of Attacks by Emotion.

For many years clinicians have commented on how emotional disturbance may initiate asthmatic episodes and numerous studies have been published attempting to outline a relationship between specific conflict situations and the development and perpetuation of bronchial asthma. The psychoanalysts have been particularly active in this field of research and some authors feel justified in proposing specific emotional influences. French (1939) remarked "the asthmatic attack is precipitated as a rule by a temptation which threatens to estrange the patient from a mother figure," and further, that the conflict situations are "of a rather uniform and typical character." In a later publication French and Alexander (1941) classified the situations capable of producing attacks. They may occur as a result of sudden intense emotion such as anger whilst crying can either initiate or alleviate an attack. Disturbance of a dependent relationship, danger to a key-figure in the environment, sexual conflicts or identification with the dyspnœic attacks of others have all been cited as precipitating factors. They also point out that the patient may use his attacks in an hysterical manner for the purpose of "gain" and thereby manipulate his environment. Furthermore, they propose that the asthmatic attack is representative of a cry of longing for the mother. Hurst (1943) regarded "annoyance and anxiety" as the most common precipitants whilst Millar and Baruch (1953) stressed the importance of anger. Extravagant and varied assertions have been made by other writers and it becomes difficult to select from so many situations several which might be regarded as specific.

In comparison with these studies Gillespie (1936) found "almost every conceivable type of relationship between psychological factors and asthmatic

attacks," whilst Leigh (1953a), Linford Rees (1956), and Stockvis (1959) regard the concept of specificity of psychic trauma as unproven.

The relationship between the asthmatic child and his environment has been widely explored. Bakwin and Bakwin (1948) remarked that the asthmatic's affinity with his mother was abnormally close, he was over-protected, his activities were limited and he was sheltered from over-excitement. One might speculate that this over-protection could be the result rather than the cause of the disorder. Millar and Baruch (1948) studied a group of 63 clinically allergic children and compared them with a control group of 37 without symptoms of allergy. In the experimental group 62 children (98.4 per cent.) were claimed to have experienced maternal rejection but in only 9 (24.3 per cent.) of the control group was this noted. However, this study was based on subjectively interpreted data obtained during interview and play therapy. In a more recent study Long, *et al.* (1958), have reported that the asthmatic child wishes to be close to his mother and there is a fear of separation. They studied the mothers of 18 such children and found that they "wished to keep the child in an infantile dependent state." All the children were admitted to hospital and there exposed to their own house dust, but this produced no respiratory disturbance irrespective of their skin sensitivity to house dust. On the one hand, therefore, the children are regarded as utilizing their illness to maintain a dependent tie with their mothers but, on the other, improve on admission to hospital. This apparent discrepancy is explained by postulating an ambivalent relationship. In addition to a fear of separation there is also a fear of being too close, and they "perceive the realization of this wish to be close to the mother as dangerous" and obstructing further growth and development. Separation can act by reducing the anxiety in association with this ambivalent relationship. They further postulate that hospitalization also reduces anxiety for asthmatic patients can utilize effective defence mechanisms and one such mechanism is their ability to elaborate and derive comfort from reunion fantasies. Fitzelle (1959) investigated the parents of asthmatic children to test the hypothesis that they would possess distinctive personality characteristics and attitudes towards child rearing to a degree which would be statistically significant. The control group was parents of non-allergic children having diverse illnesses. The personality characteristics were explored with the Minnesota Multiphasic Personality Inventory and parental attitude was assessed with the U.S.C. Parent Attitude Survey. No significant difference was found between the experimental and control groups using either index, nor between the parents of those children with the most severe compared to those with the mildest symptoms.

It would appear that the claims made for specificity of emotional stimuli and the significance of a disturbed mother-child relationship in asthma are, as yet, unproven. Most of these claims are based on subjectively interpreted material forthcoming during psycho-analytic interview and it is doubtful if they would survive scientific scrutiny. It is more feasible to regard different asthmatic episodes in the same individual as capable of being precipitated by a variety of factors. Thus, one attack may be due to contact with the appropriate allergen

and the next in relationship to infective or psychological factors. The one feature common to all of these is that they produce a disturbance in homeostasis in persons who are genetically predisposed.

It is relevant at this point to discuss briefly several of the patients who have been treated in this department and outline the rôle played by emotional factors in their asthmatic attacks. However, these cases are only representative of those referred to psychiatrists and cannot be regarded as typical of asthmatics generally.

Case No. 1.

Case No. 1. Mrs. J. was a 30-year-old housewife, who was referred with a 16-year history of asthma, which was becoming progressively more disabling, and had resulted in frequent admissions to hospital. She had had a very unstable home background. Her father was an alcoholic who had died fifteen years earlier, and her mother was an irritable, stubborn woman of 65 years who was an epileptic. Her father, two paternal uncles, a sister, cousin and nephew had all "bad chests." Although adequately provided for materially, there were frequent rows between her parents on account of her father's alcoholism and the patient was extremely unhappy at home. As a child she had nightmares, walked in her sleep, and was a nail-biter, but had no difficulties at school, and was of average ability. Until her marriage when 20 years of age she had seven different jobs but had to leave each because of her asthma and irregular attendance. Her marriage has been reasonably satisfactory and her husband has developed a very protective attitude towards her. In 1951, because of the intractable nature of her symptoms and failure to respond to a medical regime, she had a thoracic vagotomy without any permanent benefit.

Whilst under our care, an attempt was made to explore the association between asthmatic attacks and life situations, anticipating that treatment would be based on these findings. However, with discussion of her various problems attacks became more frequent and severe, and it was decided on this account to concentrate on the emotional setting of current attacks. In hospital attacks were noted to be precipitated by any event which threatened her security—minor disagreements with other patients, and on one occasion when she was moved to another bed. Eventually she began to discuss and appreciate how suppressed emotions produced an attack. She was well on discharge, but was unable to attend subsequently for follow-up purposes.

No detailed exploration of psychodynamics could be made because of the risk of precipitating severe attacks, but it was evident that (i) sudden emotion could produce an attack, especially when her security was threatened, (ii) attacks occurred instead of openly expressed resentment and hostility, and (iii) she was utilizing her illness to manipulate circumstances to her advantage.

Case No. 2. Mrs. G. was a 24-year-old housewife who was referred because of asthmatic attacks of five years' duration. Again there was a family history of instability and parental discord. The patient had no neurotic traits in childhood, made a good adjustment at school, and was then employed as a shop assistant and had a fairly satisfactory work record. She married when 18 years of age, and her first child was born four months later, but died of "convulsions" when five months old. The second child, a girl, is 2 years of age.

A few days after the death of the child she developed a productive cough and dyspnœa. She gradually became more breathless and was admitted to hospital one month later and subsequently had frequent attacks of asthma necessitating in-patient treatment on several occasions. She was well during her second

pregnancy but when the baby was six weeks old the attacks began again. About this time they moved into a prefabricated house in which they still live, and from then the attacks occurred every two weeks or so. The episode leading to admission had been precipitated by an argument with her husband.

Psychotherapy was conducted along very simple lines in view of the patient's rather low intelligence. It was found that she was well only during those periods when she was near her mother and that the attacks were often precipitated by worry in her own home or anxiety about how her mother was faring. When near the mother she felt secure and happy, but on the other hand disliked her own home and neighbours. It transpired that during the pregnancy, when well, she had been living near home. During exacerbations in the illness her mother invariably took both the patient and the child to live with her. The patient said, "If it wasn't for her, life wouldn't be worth living," and admitted that she relied on her mother for many things, especially since the onset of the illness. However, she described the mother as argumentative and jealous, and felt at times that she could "murder her." It is apparent that her relationship with this parent was a hostile one while at the same time being very dependent on her.

The circumstances of the child's death were explored and she remarked that prior to his death he had been breathing very quickly and she wondered if he had asthma. She felt a considerable amount of guilt, firstly that he had been unwanted, and secondly that perhaps she had neglected him in some way.

In interview it was repeatedly pointed out to her that there was a relationship between emotional upsets and asthmatic attacks. Once she became aware of this, she was able spontaneously to recall numerous incidents in the past when asthma had occured in a setting of emotional turmoil. In addition, she became rather more aware of the kind of relationship that she had with her mother. She became symptom-free and remained well for the remainder of her stay in hospital. She was subsequently reviewed as an out-patient and although attacks still occurred they were not so severe, prolonged or crippling.

Case No. 3. This patient illustrates how the onset of the illness was related to the disturbance of a dependent relationship. Psychologically the attacks can be understood as an expression of resentment and hostility in a person who throughout life has had difficulty in exteriorizing emotion.

Mr. S. was a clerk aged 40 years. He had been an only son whose father had died following an accident when the patient was 6 years of age and his mother had died suddenly in 1955 following a cerebro-vascular accident. She had always been over-protective and health-conscious, and the patient described his childhood as "spoiled, pampered, and well looked after." He was denied the freedom other boys had. Even at the age of 10 years he was put to bed excessively early and recalls vividly how he used to watch with envy his friends playing in the street below. He had to visit many devoted and fond relatives in his mother's company and he was often embarrassed such was the degree of their affection and solicitude for him. He described vehemently how he was "bored to tears and soured by it all." Nevertheless, although never reprimanded or punished, he sought his mother's advice and approval in all things. As in Case No. 2, his relationship to his mother was undoubtedly a hostile-dependent one.

Throughout life he has had great difficulty in exteriorizing emotion. Thus, when angry, he would not demonstrate it overtly, but would feel "tightened up inside." He liked to be popular and was extremely sensitive to expressions of hostility on the part of others and did his best to avoid such circumstances by adopting a placating rôle.

He married at the age of 27 years, but until his mother's death continued to make his home with her in spite of his wife's effort to break this tie. He found

his wife disappointing as a partner and resented the fact that she paid more attention to her own parents than to him. His mother, however, provided many of the attributes he apparently sought from his wife and she continued as the key-figure in his environment until her death. A few weeks later he noticed that he could no longer bound up the stairs to his office with his usual vitality, and was quite dyspnœic on reaching the top. He developed frequent acute asthmatic episodes requiring numerous admissions to hospital and between these attacks he was wheezy and breathless.

Further exploration revealed that he considered his wife lavished much more attention on their children than on him and also that the asthmatic attacks were often precipitated by minor disagreements with her. He had no one to turn to after his mother's death to satisfy his dependency needs other than his wife, and she was either unwilling to or incapable of accepting these demands.

In psychotherapy he was encouraged to ventilate his feelings and his interpersonal relationships and dependency needs were discussed. He appreciated how his attacks were often precipitated by emotion, and he appeared to gain understanding of the psychogenic factors operating in his illness. He seemed to think that other than understanding the various factors involved he had little more to do. At this stage he was cheerful and brisk and was not dyspnœic. Subsequently, however, when he realised that he would have to adopt different attitudes to his circumstances than formerly and deal with his various problems instead of escaping from them in illness his condition began to deteriorate again. He became very demanding and dependent on the doctor treating him and this dependency was utilised to show him that it was merely a repetition of a life-long pattern. His wife was interviewed on several occasions but obviously was quite incapable of adopting the dominant rôle. Since discharge he has attended as an out-patient for supportive psychotherapy. During these interviews he is afforded an opportunity to discuss his problems and at the same time discharge some of his hostility and resentment. His attacks persist but are rather less frequent, he has returned to his work in a full-time capacity and has not required readmission to hospital.

The Electroencephalogram in Bronchial Asthma.

Investigation of the electroencephalographic pattern of asthmatics has produced a number of conflicting reports. The first of such studies was by Rubin and Moses (1944), who drew attention to a characteristically high alpha index, i.e., the percentage of time that alpha rhythm can be counted in standard time records. Dees and Lowenbach (1948) reported their observations of 85 allergic children, 56 of these being asthmatics, and compared the findings in this experimental group with a control group of non-allergic children. Occipital dysrhythmia was noted in almost 50 per cent. of the allergic subjects and there appeared to be a positive correlation between this finding and both the duration of symptoms and a family history of allergy. The longer the illness the higher the proportion of patients having changes in the occipital pattern and a positive family history was associated with dysrhythmia twice as commonly as was a negative one. They concluded that allergy may be expressed in an abnormal E.E.G.

However, when Chobot and his co-workers (1950) repeated this work in 80 allergic children, including 52 asthmatics, they dismissed occipital dysrhythmia as being of no significance, noting that it was often observed in normal children. There was no apparent correlation between the clinical types of allergy and

E.E.G. patterns and, as had been observed by Dees and Lowenbach, anti-histamine preparations failed to alter the tracings. The authors were careful to point out that interpretation of the E.E.G. of childhood is difficult as norms have not been well established and as the incidence of slow potentials varies with age and physiological maturation. The older the child the less uncertain is the interpretation of the record.

Holmgren and Kraepelin (1953), reporting on one hundred asthmatic children, aged 2 to 15 years, showed that 36 per cent. had abnormal records as compared to 5 per cent. of a "normal" population of 150 children. They admitted that at present no satisfactory answer can be given to explain this difference. Leigh and Pond (1956) studied the E.E.G.s of 55 adult asthmatics and contrasted them with a group of psychiatric patients matched for age, sex, and social status. These controls were patients with psychopathic states or severe neurosis. It was found that 60 per cent. of the asthmatics had normal records. In 30 per cent. there was an excess of intermediate slow activity and the remaining 10 per cent. showed only minor abnormalities. Almost identical changes were present in the control group. It was considered that there was nothing to differentiate the E.E.G. anomalies in adult asthmatics from those in a group of patients with neurosis or personality disorder.

It has been postulated that in a proportion of cases the abnormalities may be secondary to repeated episodes of hypoxia. However, Holmgren and Kraepelin (1953) were unable to confirm the presence of a positive correlation between the duration of illness or age of onset and the frequency of abnormal E.E.G.s. They noted that during acute attacks of asthma marked changes occurred but these subsided at the end of the attack. The high incidence of psychiatric disorder in relatives of asthmatics and the hereditary nature of the disorder would seem to indicate that the anomalies are transmitted on a genetic basis.

Experimental Studies in Asthma.

It may be of interest to refer briefly to some of the experimental studies in asthma of which many have dealt with conditioning.

Ziegler and Elliott (1926) compared the heart rate and respiratory response of six asthmatics when asked to think of some emotion-provoking topic. In three of these subjects psychological factors were regarded as conspicuous and in these patients there was a significantly greater response to the test situation. Wolf et al. (1950) noted congestion and swelling of the nasal mucosa of allergic patients when stressful material was introduced at psychiatric interview. They suggested that the bronchial mucosa acts in a like manner, and this response to stressful stimuli is a defensive one of shutting out and washing away. Funkenstein (1950) investigated the responses to mecholyl and adrenaline in six patients who were mentally ill and had a history of asthma. When the patient was mentally disturbed but the asthma in abeyance he demonstrated altered sympathetic nervous system function. When not psychotic, but having asthma, there was increased parasympathetic activity.

The relationship between conditioning and asthmatic attacks has been noted for many years, but only recently have attempts been made to study this experimentally. Dekker and his co-workers (1957) were able to produce conditioned asthmatic attacks in a laboratory setting. Two patients with severe bronchial asthma were sensitive to grass-pollen and house-dust extract. Each reacted to the appropriate allergen administered as an ærosol in the laboratory. Following these exposures they had an asthmatic reaction after the inhalation of the neutral solvent or oxygen, or even with the introduction of the glass mouthpiece disconnected from the inhalation apparatus. Deconditioning by psychotherapeutic supportive interviews had only temporary success. They outlined the work of Noelpp. An asthmatic-like reaction was induced in guinea pigs by an ærosol of antigen or histamine. This, the unconditioned stimulus, was then paired with a conditioned auditory stimulus. After five conditioning trials, one of eight animals had an asthmatic type of respiration in response to the conditioned stimulus. With an additional five conditioning trials an asthmatic response occurred in three more of the animals. Ottenberg (1958) produced conditioned asthma in young male guinea pigs, but these responses extinguished rapidly. A variation in susceptibility was found suggesting an inherent biological difference in disease reaction patterns. The author admits that although the observed responses closely resembled human asthma "whether the attacks reported are analogous to human bronchial asthma is still subject to much controversy."

Psychiatric Treatment of Asthma.

The psychiatrist's therapeutic approach to asthma does not preclude the use of medicinal measures and, whilst regarding physical and psychiatric measures as complementary, I will only deal with the latter.

Reports of individual cases who have responded satisfactorily to psychiatric treatment may appear to be impressive, but as Leigh (1953a) has pointed out, a study of therapeutic response must of necessity include a matched control group of asthmatics not treated by recognised psychiatric methods, a standardised therapeutic regime, the use of statistical measures and a sufficiently long follow-up period, the proposed minimum being five years. Most of the reported studies have neglected the vagaries of the disorder with its tendency to remission and relapse and no scientifically acceptable investigation of response to psychological measures exists at present. The various forms of psychiatric treatment which have been employed may be outlined.

1. Individual Psychotherapy.

The psychiatric interview is the principle method of treatment in the several forms of psychotherapy. A number of authors, amongst them Rogerson (1937) and French and Alexander (1941) discuss the favourable results achieved with this form of therapy. Rogerson studied the response of twenty-two asthmatic children to simple psychotherapy and play therapy. Seven were free from symptoms for six months or more, five for two to four months, four for over one month, three were not improved and three not available for review. The

follow-up period is obviously inadequate and the study does little to elucidate the rôle of psychotherapy in asthmatic patients. Sixteen adults were treated by French and Alexander and in all eight became symptom-free, whereas five were much improved and the remainder unchanged. The follow-up periods were inadequate as the longest was four years and the shortest three months. Only three of eleven children treated were symptom-free and again the duration of follow-up was short—the maximum period being twenty months. Stockvis (1959) has recorded his initial impressions of forty allergic patients (thirty-five asthmatics) treated psychotherapeutically and subsequently reviewed for periods varying between six months and over two years. An improvement was noted in 40-50 per cent. and he concluded that in those cases where psychotherapy is indicated the patient often benefits.

It is apparent that although individual cases seem to respond satisfactorily to psychotherapeutic measures the experimental criteria as outlined by Leigh require to be fulfilled before the psychiatrist can substantiate his clinical impressions by categorically stating that psychotherapy is an effective method of treatment.

2. Group Psychotherapy.

There is widespread agreement that individuals in a group are influenced by the attitudes and reactions of those around them, and that some emotions readily become intensified in this setting. When such features can be utilized by harnessing them to therapeutic goals this form of treatment is a valid approach to a variety of emotional problems.

Bastiaans and Groen (1955) advocated group psychotherapy in association with routine medical measures. They remarked that their groups were initially very sceptical about this approach, hostile to the group method and denied the relevance of emotional factors. Whilst they used a control series the number of patients studied was too small for a valid comparison of results. Scarle and Crocket (1957) treated sixteen female asthmatic patients who were considered to have significant emotional factors in their illness. A physician co-operated by advising on physical treatment concurrent with psychiatric measures. The group was treated by a modified analytic technique closely following that described by Foulkes (1948). Each patient was initially assessed by a physician without any special psychiatric training and the relative preponderance of allergic, infective and psychological factors was assessed. The experimental group consisted of those patients in whom psychological factors were regarded as prominent and six control groups of varied composition were established; for example, where allergic factors were conspicuous and infection and psychological mechanisms were regarded as of minor importance; or again, where infection was considered to be of primary significance. All patients were treated medically, but the experimental series had, in addition, group therapy. It was shown that this group did not do significantly better than the controls with regard to the asthma, but there was a marked reduction in anxiety and tension. It was concluded that, on this account, it may be a useful adjunct in the treatment of those patients who exhibit significant emotional factors in their illness. Groen and Pelser (1960), however,

regarded their results with group psychotherapy as disappointing. More studies are required before this form of treatment can be adequately evaluated, but even if its only benefit is in reducing anxiety and leading to an improvement in the patient's attitude to his illness it would seem to be a rewarding therapeutic measure.

3. Environmental Adjustment.

If we postulate that situational factors are of importance in precipitating attacks in certain individuals the hypothesis could be tested by removing the patient from his environment and observing his response. It might be claimed by some clinicians that any improvement could be attributed to removal from a specific allergen, but this is not the only explanation, as has been shown by the studies of Long et al. which have been already outlined. Again Peshkin (1930) found that in his series of 425 asthmatic children forty-one did not respond to a medical regime. Of these twenty-five were treated by environmental change and twenty-three were markedly improved or relieved. It was eventually possible to return seventeen of the children to their homes, and presumably to the same allergen—containing milieu but 76 per cent. maintained their improvement. The sixteen children not treated by environmental manipulation did not improve. Rogerson et al. (1935) reported that certain children suffering from some of the manifestations of the "asthma-eczema-prurigo" complex were sent to a convalescent home and usually the more intractable cases were chosen. Again, the majority showed an immediate improvement. Hurst (1943), commenting on this subject, said "the bad influence of the home on many asthmatic children is to a great extent a reflexion of their parents' anxiety. It is the psychological rather than the allergic atmosphere from which they need to be removed." He remarked on the frequency with which an asthmatic episode follows the first visit of parents to a child who has been moved to new surroundings. Hallowitz (1954) found that 85 per cent. of his patients were symptom-free or much improved after separation from their families.

Such measures may be avoided by incorporation of the patients' relatives into the therapeutic regime although a proportion will show themselves incapable of modifying their attitudes. It is in this sphere that the contribution of the psychiatric social worker or almoner is invaluable.

4. Other Measures.

E.C.T. has seldom been used for the treatment of asthma, but has been employed when depressive symptoms have developed in an asthmatic individual. It was used by Kerman (1946) for two asthmatics who developed depressive illnesses and in both there was a satisfactory improvement in mood. Leigh (1953a) gave E.C.T. to six asthmatic patients where depression was the presenting disorder and no harmful effects were noted on the asthmatic condition either during or after completion of the course. Cohen and Holbrook (1947) postulated that "autonomic imbalance" occurs in certain allergic individuals and on the basis of this hypothesis gave a course of E.C.T. to two female patients with "extrinsic bronchial asthma." Both were made worse. It is evident that E.C.T. has no place

in the treatment of asthma, per se. Godlowski (1946) found that of eight cases of allergic bronchial asthma who had failed to improve on other measures, seven responded to insulin shock therapy with complete disappearance of symptoms. The duration of follow-up varied from eight months to two and a half years. The insulin dosage was between 80 and 180 units and the duration of treatment was six to nine weeks. Sargant (1951) treated a 28-year-old male asthmatic by leucotomy. The illness was of eighteen years' duration and there had been no response to any other form of treatment. Prior to the operation he was having two to three attacks weekly, whereas in the two years following operation he had only three attacks and anxiety was less prominent. However, there was a marked personality change post-operatively.

Death from Asthma.

In those patients presenting with a long history of bronchial asthma it is common to find emphysematous changes in the lungs eventually culminating in right heart failure and death. In others death may occur in status asthmaticus or suddenly and unexpectedly. Robertson and Sinclair (1954), after a review of previous studies, describe the clinical and pathological features of eighteen cases of fatal asthma. Of their patients thirteen died suddenly, without warning and often in a few minutes. The post-mortem findings in such cases are characteristic and consist of voluminous lungs which do not collapse when the thorax is opened, extensive mucous plugging of the bronchi, thickening and hyalinization of the basement membrane of the bronchial mucosa, cosinophilic infiltration of the bronchial walls and hyperplasia with degeneration of the mucous glands. Although the pathological features have been well documented the immediate cause of these sudden deaths has not been clearly defined.

Whether sudden death occurs more frequently in patients with marked emotional factors in their illness is open to question, but Robertson and Sinclair pointed out that a "psychological background" was present in twelve cases, although not expanding on this comment. Leigh's case (1955) adds further weight to this in view of the presumptive connection between a psychotherapeutic interview and sudden death. He reported in detail the case of a 40-year-old asthmatic woman who died suddenly nine hours after her fourth interview during which she had been extremely disturbed. Discharge of emotion may be shown in various ways; for example, by weeping or increased gastric acid secretion, and it seems reasonable to postulate than an acute emotional discharge is associated with an excessive secretion of mucous into the bronchi. It was suggested that sudden death several hours after psychotherapeutic interview is probably the result of parasympathetic over-activity during the intervening period, with increased bronchial secretion and death from asphyxiation.

Conclusions and Comments.

In many cases of asthma there is an allergic component which is genetically determined, but psychic influence may determine the degree to which allergic factors can become manifest. With respect to the personality of asthmatics, there

is no general agreement as to its structure or even if such a specific personality-type exists. It is generally agreed that emotional upset and conflict situations are often involved in the development of bronchial asthma, and it would appear that a variety of psychic determinants may be operating. Asthmatic attacks may be partly understood in terms of a conditioning model.

Psychotherapy, allied with medicinal measures as indicated, must remain the first and most important therapeutic measure. In assessing the patients milieu social work is essential both as an exploratory and therapeutic measure. It is, of course, out of the question and unnecessary for a psychiatrist to see every case of asthma referred to hospital or seen by his practitioner. On the other hand, psychiatric treatment can offer little in long-standing cases especially where irreversible secondary physical changes have occurred. Referral to a psychiatrist might be considered in the following instances:

(i) where complex psychological factors become obvious to the clinician within the first few attendances,

(ii) where there is an unexpected failure to respond to appropriate physical measures of known potency,

(iii) where there is a discrepancy between the degree of physical incapacity and physical signs,

(iv) where attacks consistently occur in certain circumstances; for example, if they clear up in hospital only to recur almost immediately on discharge, or again if they are noted to occur only when relatives are visiting.

Experimental evidence on the part played by conditioning is an additional reason for early referral should emotional factors be considered important.

I wish to thank Professor J. G. Gibson for his helpful criticism and permission to publish the cases.

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REVIEW

HANDBOOK OF NEUROLOGICAL DIAGNOSTIC METHODS. By F. McDowell, M.D. and G. Wolff, M.D. (Pp. 210; figs. 65. 36s.) London: Baillière, Tindall & Cox, **1960.**

THIS handbook fulfils a need. It is too detailed and long for the undergraduate but the houseman in the neurological wards, and one hopes in the general medical wards, will find much practical guidance. This bench book is the culmination of 28 years' neurological practice and teaching in the Neurological Division of the Department of Medicine of the Cornell Medical College. It is a practical manual of the examination of the central nervous system. It also contains detailed information on performance of special tests such as perimetry, cystometrics, caloric tests, electroencephalography, lumbar encephalography, arteriography and myelography. The print is good but the book is a little too big for the pocket and possibly nothing would be lost if it were pruned, particularly the last forty pages.

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THE EFFECT OF THE LENGTH OF TIME TUMOUR CELLS SPEND IN SUSPENSION ON THEIR ABILITY TO ESTABLISH GROWTHS IN HOST RATS

By DAVID R. HADDEN, M.B.

Sometime Student Assistant in the Department of Surgery, University of Illinois College of Medicine, Chicago, U.S.A.

Senior House Officer, Royal Victoria Hospital, Belfast

Introduction

Most methods of studying the effects of chemotherapeutic agents on tumours in the rat involve the ability to obtain a reproducible series of tumours in similar animals at the same time. This is done by transplanting portions of a suspension of cells prepared from a tumour in a donor animal to a series of host rats of the same breed. (Lucke et al., 1952, and Cole et al., 1956).

The conditions which will affect this process are many, but given a standard tumour of known reproducibility in a standard breed of animal, the main factors will be:—

1. The age of the suspension.
2. The number of cells transplanted to each animal.
3. The physical conditions (temperature and composition) of the suspension while awaiting transplantation.

This experiment studies the effect of the first of these factors.

Methods.

Using a strain of Walker 256 Carcinosarcoma growing in Sprague-Dawley female rats, suspensions were made by the method originated by Schrek (1936) (c). A well-formed tumour, about 1 cm. diameter, obtained on the abdominal wall of a donor animal, was dissected out aseptically. Using normal saline as a diluent, it was closely minced with scissors and filtered through a fine wire mesh, giving a pure suspension of tumour cells in a total volume of a few ccs.

The concentration of cells in this arbitrary suspension was determined, after gentle shaking for two minutes, by cell counts in a hæmocytometer chamber. It was found that a Fuchs-Rosenthal C.S.F. counting chamber was the most satisfactory, as it allowed a twenty times more dilute suspension to be counted than did the Neubauer pattern.

Some cells were disrupted in the mincing process, and these were distinguished by staining the sample being counted with Eosin. Only those with intact cell

membranes resisted the stain, and these are called "unstained cells" in the results. Collier et al. (1959) used a solution of Eosin 1 : 1000 in Tyrodes solution as a diluent in the pipette, diluting one part of suspension with nineteen parts of dye. By using a stronger dye solution, and taking nineteen parts suspension to one part dye, and using the Fuchs-Rosenthal chamber, accurate counts of suspensions containing as few as 525 cells per c.c. could theoretically be made, thus eliminating the necessity for critical dilution of the stock.

Richter and MacDowell (1933), and Schrek (1936) (a), have shown that the size of the inoculum has an effect on the success of tumour transplants. The concentration of cells in the original arbitrary suspension was adjusted with normal saline so as to obtain a sufficient number of cells in each dose to eliminate this variable, even when the proportion of unstained cells became low.

It was found in pilot experiments that a concentration of about 4,000,000 cells per c.c., of which 75 per cent. were initially unstained, gave a sufficient number of such cells at all times.

The experiment was conducted throughout at normal room temperature.

Two suspensions, (A) and (B), were prepared from separate donor animals, (A) being twelve hours older than (B). This allowed studies over two twelve-hour periods to cover a total time of forty-eight hours of suspension ageing (as the work was done single-handed).

Groups of four rats were inoculated subcutaneously on the abdominal wall at frequent intervals with 0.25 c.c. of the appropriate suspension. The number of unstained cells remaining was also frequently determined by counting samples from the stock suspension.

Results.

These were assessed after nineteen days. As shown on the graph, no tumours were obtained when the suspension was over twenty hours old.

At this time there were still about 50 per cent. of the cells which retained the integrity of their cell membrane, and the total dose was in the region of 500,000 such cells to each animal.

Establishment of a tumour was allowed when a growth of over 1 cm. was reached. Many of the rats in the later groups developed small subcutaneous nodules indistinguishable from incipient tumours in about seven days, but which subsequently regressed. At sacrifice these were shown to have been small abscesses, and no tumour cells were found histologically. The suspensions became increasingly contaminated in spite of precautions during the counting procedures, and B-hæmolytic staphylococci were isolated on several occasions.

Discussion.

The vital staining technique of studying the environmental factors affecting experimental tumour growth and transplantation was first introduced by Schrek (1936) (C). He found that stained and unstained cells could readily be distinguished, the stained ones being diffusely pink, and the unstained ones almost transparent.

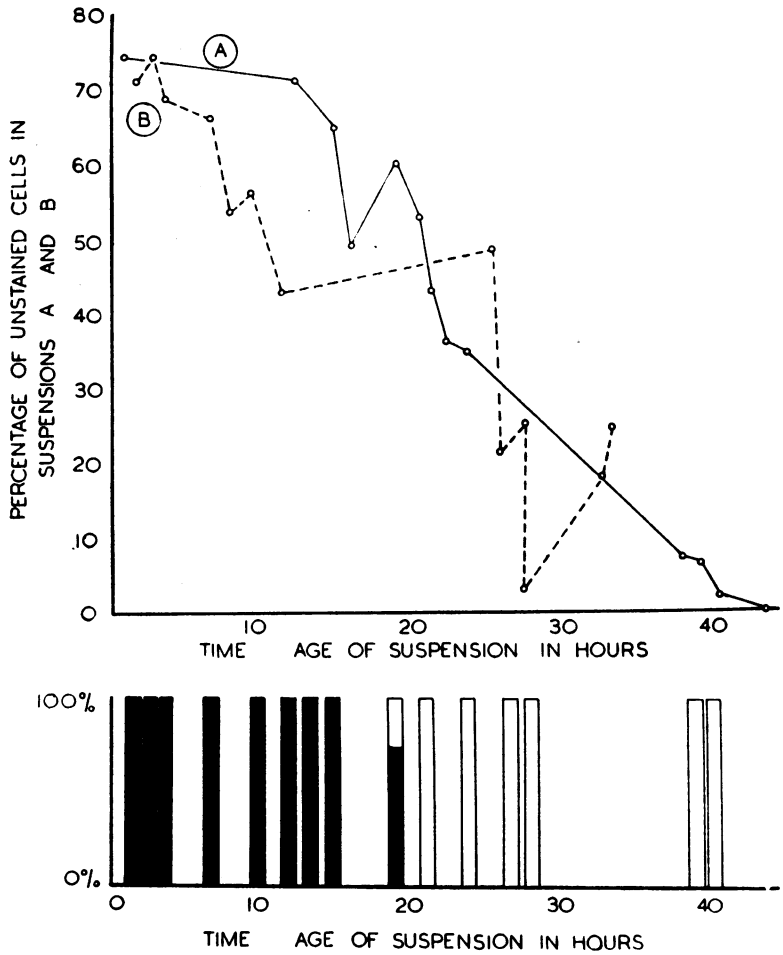

Fig. 1—*Upper graph*: Showing the percentage of unstained cells in the suspensions (A) and (B) as ageing progressed.

Lower graph: Showing the percentage of tumours growing nineteen days after inoculation of the host rats, at intervals, with 0.25 c.c. samples of the suspensions (A) and (B).

However, imperviousness to Eosin in suspension is always an artificial criterion of cell viability, where this means the ability to effect a tumour transplant. A living cell essentially has the properties of respiration and selective permeability of its wall: specialized functions, such as mitosis, mobility, phagocytosis and contractility are not essential to life (Schrek, 1943). Several dyes have been used for supravital staining, notably Trypan Blue (Pappenheimer, 1917), and Neutral Red. Eosin seems to satisfy the requirements of non-toxicity, good differentiation, and rapid action.

A cell which has lost its impermeability to Eosin has for long been assumed to have lost its ability to effect a tumour transplant, following experiments on the traumatic disruption of leucocytes (Pappenheimer, 1917). In pilot experiments it was found that prolonged staining of the suspension led to a more rapid disruption of cell walls than in the normal ageing process. In this way it could be shown whether these stained cells showed altered viability to unstained cells of a suspension of similar age, under the limits of twenty hours established above.

The converse, that all cells which resist staining are viable, has never been held. It is definitely disproved in this study, where doses of over 500,000 unstained cells failed to produce any takes.

The critical number of cells necessary to effect transplantation has been studied by McDonald et al. (1957). This present work has thrown light on the considerable inaccuracy of simple hand-shaking and dilution methods, and further work in this field should be carefully controlled by large-scale cell counts to prevent distribution errors.

The physical conditions under which the suspension is kept while awaiting transplantation are of great importance. Infection has long been recognised as deleterious to transplantation (Schrek, 1936 (a)). It has been prevented by working at 45° C., but this led to irregular results from other causes (Schrek, 1944). This study was complicated by the need for frequent sampling of the stock suspension, and cross infection was not always adequately controlled.

Collier et al. (1959) and McDonald et al. (1960) have reported studies on experimental wound irrigation in groups of rats in which suspensions of tumour cells had been inoculated one hour previously. They performed their studies on the same day as the suspension was prepared, but no exact time interval was stated for the period between preparation and inoculation.

A practical application of the work arises in relation to the storage of bone marrow cells while awaiting transplant to irradiated victims. Billen (1957 and 1959) has established suspension age limits in mice of four to six days. He used a medium containing Phenol Red as an indicator of change in pH, and penicillin and streptomycin to prevent contamination. Mannick et al. (1960), found dog marrow suspensions viable after twenty-four hours at 4° C., but not after ninety-six hours. He controlled the in vivo tests with in vitro studies of D.N.A. synthesis, which may come to be a more certain criterion of viability than vital staining.

Conclusion.

Walker 256 carcinosarcoma cells, after twenty hours in isotonic saline suspension at room temperature, lose their ability to establish growths when transplanted to host rats of the same species.

The element of infection may have been greater in this study than when the suspension is simply counted once and injected into a large group of animals, but the work does suggest the need for more accurate control of the age factor in experiments of this type.

I wish to thank Dr. Warren Cole for giving me a post in the Department of Surgery, University of Illinois College of Medicine, Chicago, U.S.A., during the summer of 1957, and to the many members of his staff who helped me. Also to Professor Rodgers and Mr. Miller Bell who encouraged me to go in the first place.

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REVIEWS

THE NEWLY BORN INFANT. By Andrew Bogdan, M.D., M.R.C.P.E., D.C.H. (Pp. 38. 3s.). Leeds: Tutorial System Publications—Pædiatric Series, 1959.

This booklet is, in essence, a students' note-book on neonatal pædiatrics to which the author has contributed a share of the notes. The text occupies only 19 of the 38 pages (there are in fact 18 pages of text, as page 28 is replaced by a facsimile of page 8). Corresponding with each of these pages is a blank page to be used for noting down information "gleaned on the words, in lectures and from textbooks."

In the preface the author states that this book is intended to assist students to acquire "a minimal background of neonatal pædiatrics." Notwithstanding its limited objective the printed notes could, with advantage, have been made more precise and informative.

I. J. C.

FAMILY PLANNING. By J. F. Robinson, M.B., Ch.B. (Pp. 64; figs. 15. 3s. 6d.) Edinburgh and London: E. & S. Livingstone.

Practitioners may wish to recommend this booklet to some of their patients and it is a clear presentation for the lay reader.

Conclusion.

Walker 256 carcinosarcoma cells, after twenty hours in isotonic saline suspension at room temperature, lose their ability to establish growths when transplanted to host rats of the same species.

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REVIEWS

THE NEWLY BORN INFANT. By Andrew Bogdan, M.D., M.R.C.P.E., D.C.H. (Pp. 38. 3s.). Leeds: Tutorial System Publications—Pædiatric Series, 1959.

This booklet is, in essence, a students' note-book on neonatal pædiatrics to which the author has contributed a share of the notes. The text occupies only 19 of the 38 pages (there are in fact 18 pages of text, as page 28 is replaced by a facsimile of page 8). Corresponding with each of these pages is a blank page to be used for noting down information "gleaned on the words, in lectures and from textbooks."

In the preface the author states that this book is intended to assist students to acquire "a minimal background of neonatal pædiatrics." Notwithstanding its limited objective the printed notes could, with advantage, have been made more precise and informative.

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Practitioners may wish to recommend this booklet to some of their patients and it is a clear presentation for the lay reader.

Conclusion.

Walker 256 carcinosarcoma cells, after twenty hours in isotonic saline suspension at room temperature, lose their ability to establish growths when transplanted to host rats of the same species.

The element of infection may have been greater in this study than when the suspension is simply counted once and injected into a large group of animals, but the work does suggest the need for more accurate control of the age factor in experiments of this type.

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CARCINOMA OF THE SMALL BOWEL: REPORT OF AN UNUSUAL CASE

By S. D. CLARKE, M.Ch., F.R.C.S.
Mid-Ulster Hospital, Magherafelt

Introduction

Tumours of the small bowel are not as rare as might be supposed. The 1949 report of the Registrar-General for England and Wales gave an incidence of 0.03 per cent., of which about one-third were carcinomata.

In a review of 132 small bowel tumours confirmed at operation during a period of forty-four years at the Massachusetts General Hospital eighty-six were found to be malignant and thirty-two were carcinomata (Darling and Welch, 1959). Nineteen of these were found in the jejunum, but length for length these tumours were considerably more common in the duodenum. Other writers (Spencer, 1953; Irvine and Johnston, 1955) agree that sarcomata of the jejenum are comparatively common compared with carcinomata. It is interesting to note that two cases have been described of the association of carcinoma of the jejenum with Crohn's disease (Ginzburg et al., 1956, 1957).

Case Report.

A man aged 42, with no previous history of illness, developed severe central abdominal pain in May, 1960. This was accompanied by vomiting and he was immediately admitted to the Mid-Ulster Hospital. On examination he was slightly shocked and exhibited generalised abdominal guarding. Rebound tenderness was present in all abdominal areas but was considered to be maximal in the right iliac fossa.

A diagnosis of appendicitis with perforation was made but at immediate operation a normal appendix was found. A considerable quantity of turbid free fluid was present. The right gridiron incision was closed with drainage and the patient was reopened through a mid-line upper abdominal incision. A firm tumour was found in the jejunum about nine inches from the duodeno-jejunal flexure. This tumour was about one inch in diameter and had perforated on the anti-mesenteric surface. A single enlarged gland was present in the mesentery. The growth was excised with the accompanying gland and continuity of the bowel was restored by an end-to-end anastomosis.

The patient made an uneventful recovery and was discharged from hospital eighteen days after admission. He has since remained well.

The pathological examination (Dr. J. E. Morison) revealed the lesion to be a highly anaplastic carcinoma. Locally complete excision appeared to have been obtained.

Discussion.

Perforation of small bowel tumours is uncommon. Ullmann (1932) mentions three perforations in eighty-five cases of lymphosarcoma and the rarity of this complication has been confirmed by others (Bradmore and Scorer, 1953; Irvine and Johnstone, 1955). Wilkie (1953) describes a case of reticulum-cell sarcoma

of the jejunum in which perforation occurred on three occasions. He states that perforation of neoplasms of the small intestine, although uncommon, usually occurs in the terminal stages of a large growth. Perforation of a carcinoma of the small bowel is even more unusual. In the large series from the Massachusetts General Hospital (Darling and Welch, 1959) only one of the thirty-two carcinomata presented with a perforation and in that case the growth was in the lower ileum. It is of interest to note that in this collection of 132 small bowel tumours presenting symptoms included—obstruction in 67 per cent.; hæmorrhage in 53 per cent.; abdominal mass in 31 per cent.; and perforation in 11 per cent.

I am grateful to Mr. W. M. Brennan for permission to report this case.

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The third edition of this book on fractures is even better than the second and first editions. The first two editions were, indeed, very excellent productions and so it can be seen that the third edition is about as perfect on the subject, and for the readers, as can be.

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INTRODUCTION TO HEALTH STATISTICS. By Satya Swaroop, M.D., Ph.D., M.P.H., F.N.I. (Pp. xix + 343. 40s.). Edinburgh and London: E. & S. Livingstone, 1960.

MEDICAL and non-medical workers in the health services, medical schools and research units of the world will find in this book an invaluable store of information about the collection, presentation, interpretation and use of statistics relating to sickness and health of small and large population groups. The author's experience of practical statistics, his work with the World Health Organisation and his knowledge of problems facing his colleagues in other countries have resulted in a book of great potential value to all persons working in local, national and international units of the medical services. He has been well served by his publishers; diagrams are attractively presented and numbered paragraphs facilitate reference. The book is set out in three parts, has a number of appendices, an excellent bibliography, a subject index and an author index. In addition, it has some 18 tables relating to birth and death rates in various countries for many years back.

The first part of the book, "laying the foundation," indicates why statistics are needed in medicine and the basic data which are required to fulfil this need. Early chapters deal with the population census, methods of predicting population, size, registration of births, deaths and marriages, notifiable diseases and the United Nations principle for a vital statistics system. The sixth chapter is probably one of the more important in the book as it deals with morbidity statistics, a subject which is becoming increasingly important now that many of the problems which arise in the interpretaton of mass aspects of disease can no longer be solved by use of mortality data alone. The final chapter in this section deals with family health records.

In the second part the author considers the administration of health statistics with particular reference to the work of W.H.O. One chapter in this section is of particular interest to public health and hospital authorities and their officials as it deals with the organisation of departmental statistics. All readers will find the observations on the design of record systems useful. The remaining chapters in this section are concerned with legislation and the use of sampling methods for the provision of community statistics.

The final part deals with presentation of data and early chapters consider various classifications used in health statistics (e.g., classifications of diseases, injuries and cause of death, of live births and fœtal deaths, classifications of data by age, sex, occupation, etc.). Methods of handling and processing records are described and four chapters deal with the calculation of mortality, fertility and morbidity rates. In these chapters every rate is defined in detail, examples are given of their calculation and, where applicable, of their trends in various countries of the world. The pit-falls of making comparisons in time and space with such rates, and techniques for attempting to overcome these pit-falls are described. A chapter is devoted to the use of diagrams and the book finishes with some observations on how to measure health or its complement, ill health.

The reader will notice that some of the formal definitions of vital statistical rates differ from those usually taught in British medical schools and used in official British publications. In each case the author quotes the current W.H.O. recommendation and no confusion will arise if his commentary is read before any definition is used. The publisher's note to this book states: "Dr. Swaroop's book should be on the shelves of every health officer because it is a guide to the interpretation of his everyday work. It provides him with the essential basis for formulating policy and for making plans to promote health within the community he serves." In my opinion this observation is fully justified. E. A. C.

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The chapter on "Indications for Transfusion" is particularly good, and, *inter alia*, the author deplores the use of blood transfusion to raise the hæmoglobin level before a non-urgent operation when, in fact, the anæmia brought about by chronic blood loss could well have been corrected by premedication with iron. Elsewhere he states: "There is no doubt that some doctors—especially surgeons—waste blood." When discussing the avoidance of errors which lead to incompatible transfusions, he writes: "In a personal series of eighteen hæmolytic transfusion reactions, four were due solely to faulty grouping and cross-matching, three were due to faulty grouping caused by an importunate clinician who kept worrying my assistant for blood, ten were due to confusion between patients of similar names, to enthusiastic ignorance, or to rank negligence unrelated to the grouping procedure, and one could not have been prevented."

In a future edition possibly some room could be found for describing the use of washed red cells, and perhaps exchange transfusions could be more fully dealt with.

This is an excellent little book and is thoroughly recommended. C. C. K.

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I APPROACHED this book with an attitude adverse to this type of publication, but was surprised to find it is excellent for its purpose, namely, that of revision before an examination, or perhaps initial reading before more complete study. A book of this size cannot hope to cover more than the general histology of the organs, e.g. three pages are devoted to the liver. What drawings there are are adequate and clear and the facts are presented in a readable and yet succinct way. There are no photomicrographs. A good feature is that the function of the structures is usually mentioned. As a "brush-up your histology" book this would be very useful. H. McG.

CONTRIBUTIONS TO OBSTETRICS AND GYNAECOLOGY. By V. N. Shirodkar, M.D.(Bonn), F.R.C.S.(Eng.), F.A.C.S. (Pp. 167; figs. 200. 37s. 6d.) Edinburgh and London: E. & S. Livingstone, 1960.

THE name of Shirodkar seems likely to go down in medical history as a synonym for the procedure invented and developed by this ingenious operator for the treatment of habitual abortion due to incompetence of the internal cervical os. The first chapter of this book, entitled "Habitual Abortion in the Second Trimester," should therefore prove of the greatest interest and practical value to all gynæcologists.

Like all good operations this procedure is simple and safe to perform. It consists of encircling the cervix in the vicinity of the weakness with one or other of a variety of non-absorbable suture materials. Currently, Shirodkar himself is using mersilene, instead of a fascial strip as formerly, and he is experimenting with two polyethylene beads fixed on the circlet posteriorly. This, he hopes, will allow temporary division during abortion or labour and facilitate simple reconstitution subsequently. Contrary to general belief, he prefers to operate in the non-pregnant state once the diagnosis is confirmed.

The second chapter is devoted largely to what the author calls his "Extended Manchester Operation." Since this is designed to avoid amputation of the cervix, always regarded as an essential part of that procedure, the use of this title must find justification in the substitution of the uterosacral ligaments plus a strip of overlying peritoneum for the traditional shortening of the cardinal ligaments à la Fothergill. These strips are cut after opening the Pouch of Douglas and inspecting them between the operator's finger and thumb, they are then crossed in front of the cervix and stitched to it. For those younger women for whom a repair procedure is imperative without losing the cervix and imperilling future childbearing this may well prove a useful variation. One cannot see it displacing the standard procedure so well established in this country. The companion to this, Shirodkar's Fascial Sling operation for Genital Prolapse, is designed for those whose uterosacral ligaments appear inadequate, or for failed cases, and is a splendid example of his ingenuity. Its singular lack of simplicity is, however, likely to deprive it of general popularity.

Shirodkar has had opportunities for the study of the surgery of blocked fallopian tubes such as are granted to few. He has made good use of these and has devised not only one of the best techniques now available but also a range of special instruments for tubo-uterine implantation.

For the construction of an artificial vagina he also describes a new technique utilising the sigmoid colon. This, he claims, gives a result less liable to cicatricial contracture and other occasional drawbacks of the current solutions to this problem.

The last section of the book contains a kind of lucky dip selection of the author's experiences and published papers. One of interest to the obstetrician is his method of reducing puerperal inversion of the uterus. This consists of pushing it back with a roll of packing gauze gripped in a swab holding forceps. This he has done on five occasions and so has a better score than most, which must make his method worth remembering.

In conclusion one cannot give too high praise to the author's clarity of exposition which is enhanced by excellent line drawings and then followed by superb serial photographs plus equally clear captions. This is the kind of book that "he who runs may read" and moreover understand.

W. R. S.

DISEASE IN INFANCY AND CHILDHOOD. By R. W. B. Ellis, O.B.E., M.A., M.D., F.R.C.P. (Pp. 714; illustrations 301. 55s.). Edinburgh and London: E. & S. Livingstone 1960.

THE first edition of Professor Ellis' textbook was published in 1951. The general format is retained in this, the third edition. The text has been thoroughly revised and brought up to date, and so have the bibliographical references at the end of each chapter. The work is beautifully and instructively illustrated—many of the 301 illustrations are in colour.

This well established book is easy to read and provides a lucid and stimulating exposition of the subject. It is certain to remain one of the most popular of pædiatric textbooks.

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THE DEVELOPMENT OF THE INFANT AND YOUNG CHILD: NORMAL AND ABNORMAL. By R. S. Illingworth, M.D., F.R.C.P., D.P.H., D.C.H. (Pp. viii+318; figs. 95. 27s. 6d.) Edinburgh and London: E. & S. Livingstone, 1960.

In this new book Professor Illingworth is principally concerned with applying the fundamental and pioneering observations of Dr. Arnold Gesell and others to everyday pædiatric practice. After quoting a number of cogent reasons why pædiatricians, general practitioners and others should be fully conversant with the normal pattern of child development and its variations, the author proceeds to examine the predictive value of developmental assessment. He concludes that developmental tests in infancy are of great value in that they can detect mental retardation and neurological conditions with a considerable degree of accuracy. On the other hand, there is little evidence that mental superiority can be detected at this early age.

To achieve a reliable assessment, Professor Illingworth emphasises the importance of taking into account all factors likely to influence a child's development and in this respect he lays particular stress on a careful evaluation of pre-natal, peri-natal and environmental factors and on a basic knowledge of conditions commonly associated with mental defect (over 75 are listed). These observations are succeeded by a chapter in which the pattern of normal development is discussed with the aid of 50 excellent illustrative photographs. There follows two extremely important chapters in which the author considers and emphasises the wide variations which occur not only in individual fields of normal development, notably speech, motor development and sphincter control, but in normal development as a whole. Subsequent chapters deal with history taking, examination, relative importance of different fields of development, mental retardation, cerebral palsy and mental superiority, with a final chapter on mistakes and difficulties in developmental diagnosis. There is also an extensive bibliography which will be of great help to all interested in furthering their reading of this important subject.

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Instead of describing separate symptoms the author discusses the various clinical syndromes and relates their appearance to the various stages of development, stressing throughout the importance of the time factor. About two-thirds of the book is devoted to the study of the pre-school child, and emphasizes the importance of this early period in the development of emotional disturbances. The school period and adolescence are discussed more briefly, but emphasis is maintained on the stresses which have in most cases arisen in the earlier period.

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M. E. L.

ACTIVE ALERTED POSTURE. By W. E. Tucker, C.V.O., T.D., M.A., M.B., B.Ch., F.R.C.S. (Pp. viii + 64; figs. 24. 10s. 6d.) Edinburgh and London: E. & S. Livingstone, 1960.

THIS monograph of 61 pages is written in a manner reminiscent of the popular press, and not that of a Medical Textbook. The reader will reach page 37 before he will find a definition of the subject matter. He will then learn that "hundreds of millions of humans" adopt a malign posture called Inactive Slumping Posture. This is the cause of most of human ailments from headaches to bunions. It can be countered by the adoption of Active Alerted Posture and this is the theme of the monograph.

Reasonable physiological descriptions are followed by very unreasonable pathological statements, such as, "From experience gained in the examination of thousands of cases, the impression is that in the early stages of postural strain something accumulates in the tissues, resulting in pain and tenderness." Anecdotes are interspersed in the text, but often without point.

The Bunyanesque use of the capital letter is continued throughout and Active Alerted Posture overcomes Inactive Slumping Posture in the long run.

The work was written for General Practitioners and Physiotherapists, but in its present form, its market will be very restricted.

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DISC LESIONS AND OTHER INTERVERTEBRAL DERANGEMENTS. By E. J. Crisp, M.D.(Cantab.), D.Phys.Med.(Lond.). (Pp. viii + 158; figs. 48. 15s.) Edinburgh and London: E. & S. Livingstone, 1960.

THIS is yet another publication on the subject of Disc Lesions. It is a valuable contribution as it sets out to show that there are many forms of treatment for the various conditions described in the book. Emphasis is laid on the value of rest (this lesson seems to be one which most General Practitioners are loathe to learn), and the author strongly opposes the use of the universal term 'Slipped Disc.' He opposes, even more strongly, the belief that all 'Slipped Discs' can be put back by manipulation.

While most of the beliefs of the author can be upheld, one or two points must be open to discussion. Surely it is not possible to apply a plaster-of-Paris jacket so tightly that it acts 'like a Thomas splint' with its distracting force on the pelvis at one end and on the ribs at the other? Traction cannot reduce a Disc Prolapse, and must act as means of aiding immobilisation. Injection into a zygoapophyseal joint may be possible, but palpation of such a joint must be a clinical feat achieved by very few.

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THE EYE IN GENERAL PRACTICE. By C. R. S. JACKSON, M.A., B.M., B.A.(Oxon.), D.O.M.S., F.R.C.S.(Ed.). Second Edition (Pp. viii + 152; figs. 26. 21s.) Edinburgh and London: E. & S. Livingstone, 1960.

PERHAPS the most important thing a medical student requires to be taught is to carry out a proper clinical examination. Provided he has this background this book gives what is intended—a simple introduction to diseases of the eye.

It is a concise and readable little book and the author is to be congratulated on the clarity of his text. Little of importance is omitted but more and better illustrations would be an advantage. The few pages on the use and abuse of the newer drugs are very timely, as one finds they are sometimes used indiscriminately. His advice on the use of cortisone and allied drugs should prove helpful.

For busy general practitioners and students who have not time to read a more detailed work this book should be very valuable. J. R. W.

THE UROLOGICAL ASPECTS OF BILHARZIASIS IN RHODESIA. By R. M. Honey, M.B., F.R.C.S.(Ed.) and M. Gelfand, C.B.E., M,D., F.R.C.P. (Pp. 71; figs. 38. 7s. 6d.) Edinburgh and London: E. & S. Livingstone, 1960.

THIS small booklet will be of particular interest to general surgeons as well as urologists practising in all parts of the world where bilharziasis remains a formidable health problem. Its contents are based on a careful study of three hundred European and one hundred African cases. The symptomatology of the disease is described, but the book is mainly concerned with the urological complications, and these are dealt with in great detail. There are many beautiful illustrations and photographs of all the sequelæ encountered in this disease. Medical treatment is hardly mentioned, but surgical management of the urological problems is fully discussed. This book can only be of academic interest to doctors in this country, but is strongly recommended to those who intend working in Africa. E. M.

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G. S.

"A PRIMIER OF MEDICINE." By M. H. Pappworth, M.D., M.R.C.P. (Pp. 241. 32s. 6d.) London: Butterworth, 1960.

DR. Pappworth, who is known to generations of post-graduate students for his refreshing if unofficial membership course, has written this book primarily for undergraduates and medical students in their first clinical year.

The book consists of sections dealing with the clinical examination of the cardiovascular, respiratory, alimentary and nervous systems, with short chapters on history taking, swellings and the diagnosis of obscure pyrexia. There is an eight page introduction in which the author gives his views on medical education, and some of its faults, and throughout the book Dr. Pappworth's comments add piquancy and flavour to what is, of necessity, rather dull reading.

The chief merit of the book, which is not inconsiderable, is the efficient summary made of the essential facts of clinical medicine, and this will be of the greatest use to those preparing for a clinical examination. The work can hardly be recommended for a first year clinical student for whom there already exist a number of better texts in the same subject. However, for those taking their finals and for post-graduate students wishing to fill the vacuum between examination papers and clinicals, the book will be found helpful and even stimulating.

D. A. D. M.

OBSTETRICAL AND GYNÆCOLOGICAL PATHOLOGY FOR POST GRADUATE STUDENTS. By R. E. Rewell, M.D.(London), M.R.C.P. (Pp. xii + 435; figs. 150. 50s.) Edinburgh and London: E. & S. Livingstone, 1960.

THIS book deals in some detail with gynæcological pathology on a regional anatomical basis, and devotes about 100 pages to obstetrical conditions and over 50 pages to a brief discussion of some conditions affecting the newborn infant.

The scope of the work is wider than the well established American textbooks which deal mainly with gynæcological pathology. The information is somewhat selected. It presents a fair and interesting account and is suitable for the obstetrician and gynæcologist reading for informaton. It is less concerned with details of less common conditions and the pathologist will not often turn to it for help, though there is a good and up-to-date bibliography. The illustrations, all in black and white, are numerous but sometimes disappointing, and it must be admitted that many photographs of histological detail are disappointing to the expert and of limited value to those who only wish to gain an understanding of a disease condition.

J. E. M.

"ILLUSTRATING MEDICINE AND SURGERY." By Margaret C. McClarty, D.A.(Edin.). (Pp. viii + 159; figs. 178. 37s. 6d.) Edinburgh and London: E. & S. Livingstone, 1960.

THE author, who is an eminent British medical artist of international repute, commences this well produced book with a brief history of the art of medical illustration and continues with an assessment of the artist's place in the modern medical school. Some of the problems which a medical artist is called upon to deal with are discussed.

The main portion of the book describes, for the benefit of authors and teachers, some of the methods and materials used in graphic art studies and much useful information is given although one statement—on page 132 to the effect that a certain transparent covering material will prevent pictures from fading—could be misleading as the permanence, or otherwise, of a picture in fact depends upon the chemical composition of the pigments used. Some of the illustrations showing pens, ink-bottles, lamps, and other standard articles might have been replaced to better purpose with further examples of the wide range of subject and style which the present day medical illustrator can handle.

A number of useful tables of weights and measures is included, but it is difficult to imagine for whom the glossary is intended. The general excellence of production is marred somewhat by inadequate proof-reading.

G. S.