NOVEMBER, 1949

THE ULSTER MEDICAL JOURNAL

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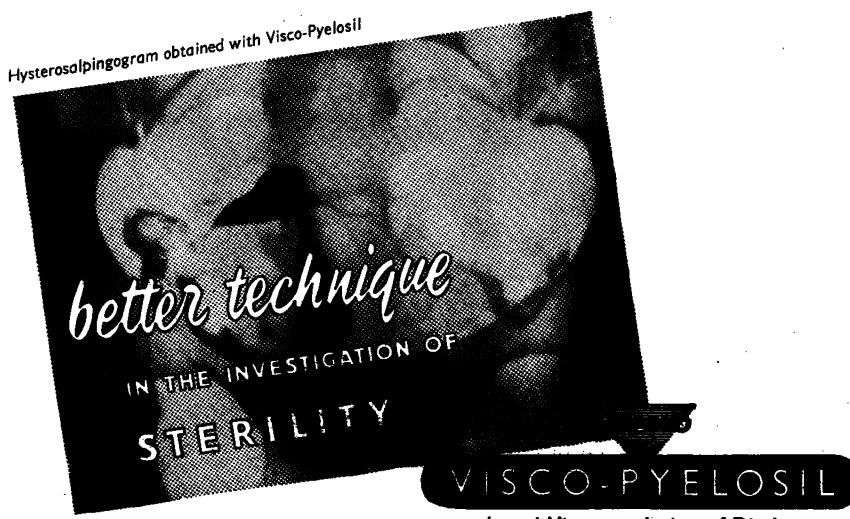

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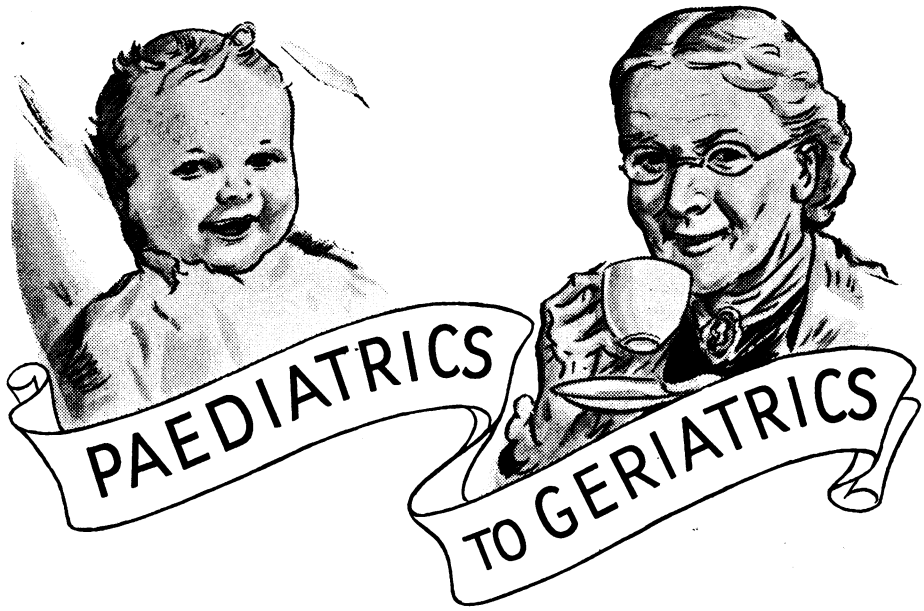

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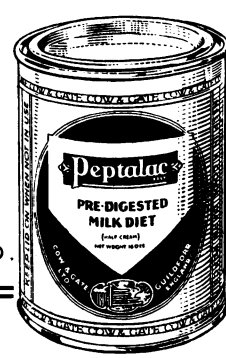

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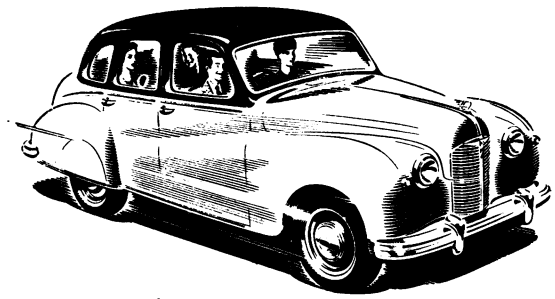

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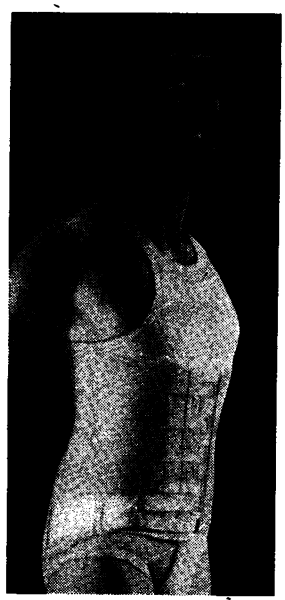

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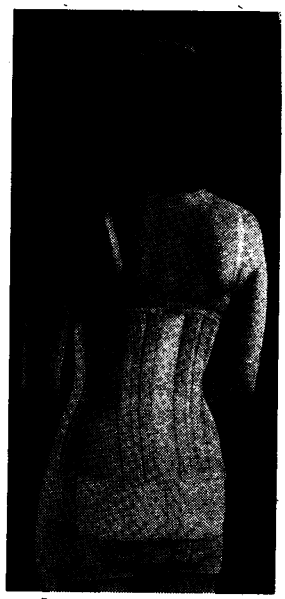

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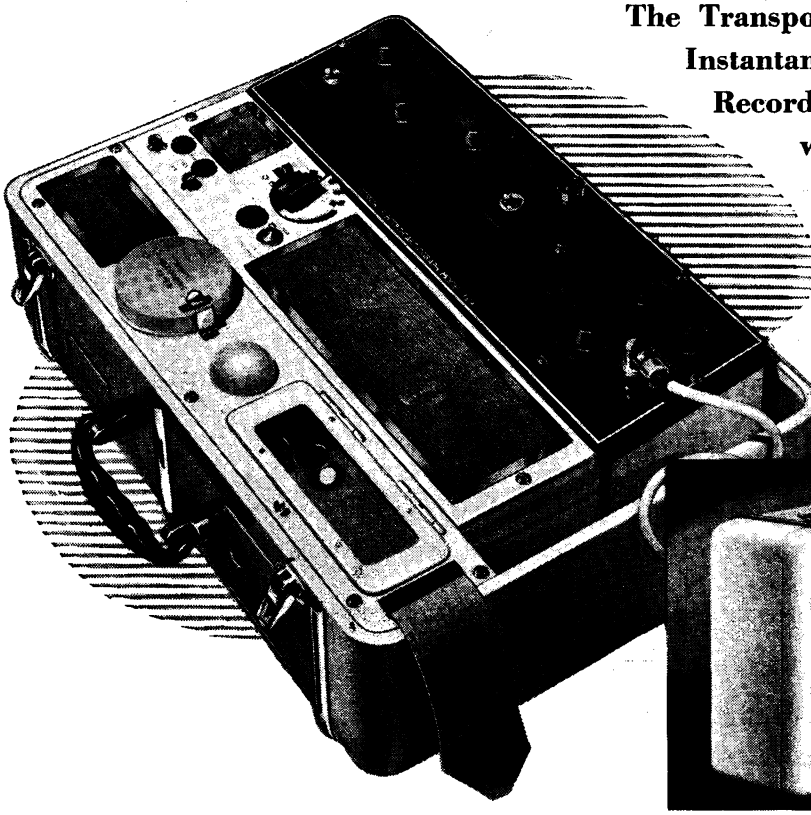

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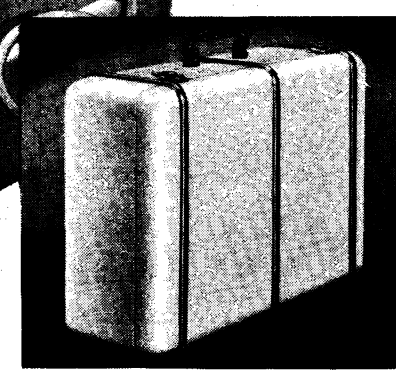

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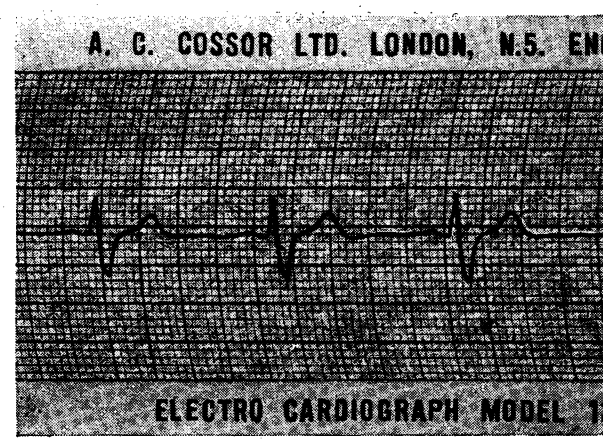

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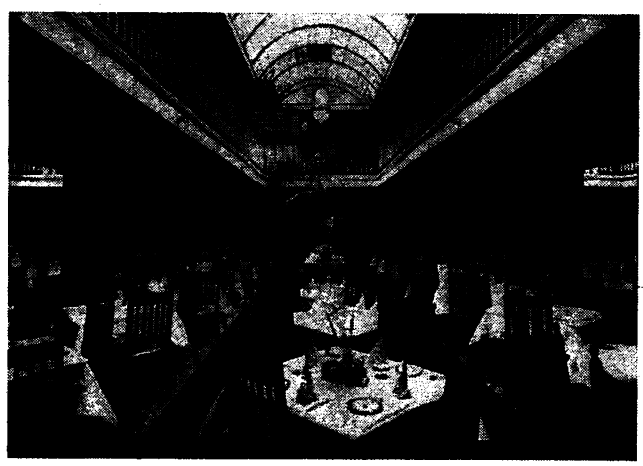

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LIST OF ADDITIONS TO THE MEDICAL SECTION MARCH-SEPTEMBER, 1949

PERIODICALS

Advances in Biological and Medical Physics, 1, 1948.
Anæsthesiology, 10, 1949.
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Vol. XVIII 1st NOVEMBER, 1949 No. 2

A Brief Survey of Early Midwifery Practice

By ALEXANDER J. DEMPSEY, M.B., F.R.C.O.G.

Presidential Address: Ulster Medical Society, Session 1949-50

IN choosing a subject for my address to-night, I was anxious to speak about something that might be of general interest to everyone present, and try to avoid anything of a technical nature, as I am sure you will have several opportunities of listening to scientific papers on medical subjects at our meetings here during the next year, given by men much better qualified for that purpose than I am. Therefore, with the desire to keep as much as possible to my own subject, I am going to endeavour to interest you for a very short time on the early beginnings of midwifery practice.

A BRIEF SURVEY OF MIDWIFERY PRACTICE

How did the modern midwifery of civilized nations develop from the original beginnings? Now that is a question, even with our most stringent research, to which we have not been able to furnish a complete answer. However, the investigations into the manners and customs, as well as the manipulations and assistance at birth, are of outstanding interest in the history of civilization.

The ancient records at our disposal are so meagre that they contain very little that is of value to us in arriving at the stage midwifery practice had reached in the early centuries B.C.

The oldest records of woman's diseases in our possession at present, mostly gynæcological, saved from the disastrous fire which burnt down the great library at Alexandria centuries ago, are contained in some of the ancient Egyptian papyri, now in the library at Leipzig University.

One of these ancient manuscripts, the Ebers Papyrus, was written about the year 1550 B.C., but in its compilation and editing may be dated back as far as the year 1900 B.C. Five columns of this Papyrus deal with obstetrics and gynæcology. The obstetric rules and prescriptions relate to the acceleration of parturition; to the methods of producing abortion; to affections of the female breasts, and to the birth prognosis for the new-born child, which depend upon the nature of its first cries and its way of holding its head.

Further references to midwifery practice contained in this Papyrus and others, such as the Kahum and Westcar Papyri, written about the same time, were special instructions and tests for the diagnosis of pregnancy, some of which, I am afraid,

are a little out of date, but nevertheless interesting. For example, one reads : "The woman is to soak two sacks (one containing wheat and the other barley) in her urine for a whole day. If they germinate, she is pregnant. If the wheat only germinates, she will have a baby boy, and if the barley only sprouts, she will have a baby girl." (Sounds an easy method, doesn't it?)

These documents, written about the fifteenth century B.C., are of more importance historically than medically by the fact that the opinions expressed in them, especially those referring to the signs of pregnancy, are almost identical with the teachings of the great Greek physician Hippocrates and the great Roman physician Galen, who lived nearly one thousand years later. However, it is reasonable to assume that long before these writings came into existence midwifery had gone through a number of phases of development, even amongst the savage races, which may have formed a basis for our present-day knowledge of midwifery practice.

In the most barbarous conditions of all the woman about to be confined was left to her own resources without any help from anyone, nor indeed did she seek any. The woman would often give birth to her baby out of doors, taking refuge in the woods or jungle, and choosing a spot near a stream in which she could bathe herself and the child immediately after delivery. The separation and treatment of the umbilical cord to prevent bleeding was done by either ligaturing it with vegetable fibres or by crushing it either with her teeth or by stones. The Maori women of New Zealand often gave birth to their babies in this way, as did some of the Malay tribes. Many of the Arab women have been known to have had their babies on the roadside, picked them up in their arms, and gone on their way.

Whilst the women among the peoples already mentioned generally go a little apart for their delivery, we find in some tribes a total lack of any regard being paid in respect of this. A confinement to them is a physiological act, at which anyone, even children, may be present, and it usually takes place in a public street. Parturition in the Hawaii Islands is said to have been formerly a public act, at which anyone who happened to be about could look on. Luckily, these barbarous customs soon became extinct, and as the tribes became more civilized the woman was taken to a hut or lying-in house, where some primitive preparations were made for the reception of the new-born.

The primitive tribes varied in their obstetrical procedure, and in the majority of them now in existence increasing skill was bound to lead to a higher degree of obstetrical knowledge.

It was only natural then, even in the most primitive tribes, that the woman in labour, crying out in her anguish, should evoke the sympathy of those around her, who would naturally come to her assistance to render whatever help they could. Therefore, we must regard it as a slight cultural advance when it became the custom for the husband not to forsake the wife in labour, and to remain by her side, rendering her whatever assistance he could. In some cases, however, the husband only acted as a supporter of the wife, on whose lap she sat, holding her from behind and pressing on her abdomen and uterus to help ease her pain, while a woman-friend of hers assisted in delivering the child.

This led to a further development in some tribes, such as in the Philippines and

Hawaii Islands, where the function of the husband was handed over to a specially trained man called a tineador. These tineadors acted as male assistants, and some of them became much in demand, depending on their skill in relieving the distress of the woman in labour. History records one such person, a carpenter by trade, living in Thuringia at the beginning of last century. This man gained such a reputation as an assistant at confinements from the fact that women sitting in his lap had a much easier delivery. He was, therefore, much in demand, and his calls to attend midwifery cases at all times were getting rather too much for him, so being of an inventive turn of mind, and a carpenter, he saw a way out, and invented and constructed our first-known aid to midwifery—the parturition chair.

That is the story of the origin of the parturition chair, believe it or not. This most elegant piece of antique furniture was originally a somewhat crude, low, four-legged easy chair, with a low-back inclining backwards. In the seat was cut such a large oval piece that there was very little of the seat left, except a narrow rim. In this, shall we say, uneasy chair the woman was placed in a sitting position, instead of in some person's lap—the attendant squatting in front to help in the delivery of the baby.

These parturition chairs, of which there were many modifications, became an essential part of the armamentaria of the midwife, and she travelled from one case to another, always bringing her chair with her. (Unfortunately, there were no bicycles in those days, so she could not strap it on to the carrier behind.) This sitting or squatting posture for the woman in labour was almost universal in those times, and from specimens of earthenware, discovered by archæologists, depicting labour scenes, they are most consistent in representing the woman in labour in this sitting position. Some of these relics date back thousands of years B.C., and it is questionable whether or not this is still the most natural position for the delivery of a child.

Dr. Kathleen Vaughan, in her book, "Safe Childbirth," advocates this position, and receives very favourable criticisms from such eminent opinions as the late Dr. Howard Kelly of Baltimore and the late Dr. Henry Jellett of the Rotunda, who, in his book, "Maternal Mortality," states: "That the modern practice of confining the patient lying on her left side is wrong." He continues: "I think, however, that the woman will deliver herself with less effort when she assumes the squatting position during the second and third stages of labour than when she is lying on her side in bed."

We might now consider how midwifery developed among the modern civilized nations of Europe. In doing so, we shall meet conditions like those which maintained in the savage tribes, but, fortunately, these primitive conditions were soon influenced by the more civilized nations. Midwifery in Rome developed under the influence of Greece and also, later, the Arabs derived a great part of their obstetric knowledge from Greek sources. On their teaching again the scientific midwifery of mediæval Europe was built up.

It is, however, to the writings of Hippocrates that we owe our first real attempt to further the art of obstetrics, for this great physician, who was born about 460 B.C., had a sound knowledge of anatomy and the bony skeleton, and foresaw the dangers to mother and child that may accompany pregnancy and labour—also

discussing the treatment of hæmorrhages at childbirth. Hippocrates had many followers, and his teachings formed the ground work of all the medical works of that time, and, indeed, for many years after.

From the earliest times the practical side of midwifery was entirely in the hands of the midwives, and the attendance and management of the woman in labour was looked upon as outside the province of the physician, except when he was called in, in very exceptional cases.

Even in the portrayals of birth and the lying-in houses, which adorn the walls of the ancient Egyptian temples, it is interesting to note that the medical male gods (of which the Egyptians possessed many) are never included, while there are many representations of the goddess Isis, who was recognized as the goddess of birth.

The midwives of these times were drawn from the poor uneducated classes, usually older relatives of the family, and ones with personal experience of having given birth to a baby themselves. Their knowledge of midwifery, however, was very scanty, there being no proper organisation for teaching or training them, and what little knowledge they possessed was only acquired by experience, and that very often at the expense of the lives of their unfortunate patients. Besides being ignorant of their work, they were unfortunately very often depraved and unscrupulous in their methods, indulging in such crude practices for hastening the birth as pounding the abdomen, shaking the patient, and even going to the extent of standing on the abdomen to massage it. They were not adverse to using drugs and other means for producing abortion—quite a common practice, as a matter of fact, in those days.

Soranus, a great Roman physician who lived in the second century after Christ, did much to try and elevate the standard of midwives, and wrote several books on midwifery and diseases of women, and to him goes the credit of being the first man to introduce the treatment by Podalic Version, a system, as you know, still in use up to the present day. His ideas of the qualities necessary in a woman who is going to be a midwife could not be improved upon, even in the present day. He writes: "She must have a good memory; be industrious and patient; moral so as to inspire confidence; be endowed with a healthy mind, and have a strong constitution; and finally, she must have long delicate fingers, with nails cut short." But to be a good midwife, according to Soranus, involves still other excellent qualities. She must have theoretical, as well as practical training, and be experienced in all branches of medicine, so as to give dietetic as well as surgical and pharmaceutical prescriptions, in order to draw correct conclusions from what she observes, and to be able to attach the proper importance to the relationship of the individual phenomena of the healing art. She must encourage the patient by cheerful talk, help her sympathetically, be unflinching in any danger so as not to lose her head when giving advice. She must, besides, already have given birth to a child and must not be too young. She must see that her hands are soft and tender, and must not do work that would make them hard. If they are not soft naturally, they must be made so by softening ointments. Remember, that was written about seventeen hundred years ago. Would we expect more from our present-day midwives?

From the second century right up to the sixteenth century, medicine suffered a severe setback, and the teachings of Hippocrates, Soranus, and the other Greek physicians were almost forgotten. Superstition gave place to rational medicine, and disease was regarded as possession by devils. Midwifery was still in the hands of the midwives, who now had monopolized the whole practice of midwifery, the physician no longer being brought in to assist at the delivery, and, indeed, most of the physicians had given up the practice of midwifery altogether. The art of obstetrics was almost lost, and suffering, disease, and death were too frequently the reward of the pregnant woman. Midwives got more careless, and sepsis following the birth became quite common. Things went from bad to worse, and the mortality from child-birth reached alarming heights.

About the year A.D. 1529 a young French physician called Ambrose Paré did much good work to revive the education of midwives, and there began a fight between the physicians anxious to improve the practice of midwifery and the midwives who were striving to retain their hold on it to the exclusion of the doctors. The prudery of the times militated against the doctors, who were in some cases obliged to carry out their work under cover of a sheet. Paré improved the operation of Podalic Version, and saved many lives by its use. He became an ardent worker on the healing of wounds, and his work in the Hotel Dieu Hospital in Paris, and afterwards in the army, did much to advance the art of surgery in this direction.

Cæsarian Section.

About this time Cæsarian Section became known, and I think I might digress for a while, and give you a brief history of its beginnings and progress.

As regards the origin of the term Cæsarian, this is more or less obscure. For a long time it was popularly believed that Julius Cæsar was brought into the world by this means, and that he obtained his name from the operation by which his birth was accomplished (a Cesa Matris Utere). It is almost certain, however, that this derivation of the name is incorrect, since his mother, Julia, lived many years after his birth, as is proven by his letters to her. At the time when Cæsar lived the operation was not known to have been performed on the living woman, at least in countries under Roman rule.

The most likely explanation is that, in 715 B.C., Numa Pompilius, King of Rome, codified the Roman law, and in this lex regia, as it was called, it was ordered that abdominal section should be performed on all women who died in advanced pregnancy, so that mother and child might be buried separately. The lex regia became lex cesarea under the rule of the emperors, and the operation became known as the cesarean operation. Cæsarian Section on the dead was probably practised by the early races, and was not unknown to the early Egyptians, but on the living subject it is of more recent date.

Perhaps the strongest suggestion of the possible early development of Cæsarian Section on the living among uncivilized peoples is furnished by the operation, witnessed by Dr. Felkin in Uganda in 1879, performed by a native specialist. The operator evidently possessed distinctly more knowledge of asepsis than his civilized confrères of that period, since he washed his hands and the field of operation with banana wine before operating, instead of deferring the cleansing of his hands until after the operation, as was more or less common in civilized practice at that time.

The patient was anæsthetized by being made drunk with the same preparation. A rapid incision of the abdominal wall and uterus was done, the child removed, and the cord cut. The placenta was then removed, the cervix dilated from above, and the uterus was massaged and compressed to check hæmorrhage. The peritoneal cavity was cleansed of liquor and blood by raising the patient up, and then the abdomen was closed by means of pin and figure of eight sutures. The wound was dressed with a paste of crushed herbs. The wound healed in eleven days, and the convalescence was only slightly febrile, with a temperature remaining under 101° throughout the whole puerperium. Such a well-developed technic suggests that the operation had been under development for a long time, and it seems very possible that Cæsarian Section may have been practised among certain barbarous races with success, perhaps for centuries, while among civilized surgeons it remained an operation of the greatest danger.

The Cæsarian Section performed by Christophorus Bainus in Italy in the year 1540, and described by Donatus, has become famous. This is the first quite indubitable case of a real Cæsarian Section performed on the living in Europe. The operator is described by Donatus as one of those people "qui per villas percurrentes peregrinantur." A dead child was extracted, and the woman gave birth to four more children in the natural way.

At the beginning of the seventeenth century a doctor, named Peter Chamberlen, practised in London as the first, and indeed very distinguished, obstetrician. He recognized the evil state of the profession of midwife at that time, and in the year 1616 made the humane and sensible proposal to the king, "That some order may be settled by the State for the instruction and civil government of midwives." Had this well-meant proposal been agreed to, England would have had the honour of being the first among all the countries to have regulated the profession of midwife, and the population of the country would have had trained and controlled midwives one or two centuries earlier that actually happened.

Chamberlen's son also became a doctor in London, and did an enormous practice. In 1646 he wrote a famous book, in which he deplored greatly that his father's advice had not been followed, and described convincingly the distress caused by untrained midwives.

Peter Chamberlen became famous as the founder of a remarkable family—nine of his descendants became doctors. It was to the son of the elder Peter Chamberlen that we owe the discovery of the midwifery forceps. These were very crude instruments at that time, but their use was the means of relieving much suffering and saving many lives. Unfortunately, the discovery of the forceps was kept a family affair, and the secret was handed down from father to son for almost the period of a century. At last, the secret of them was sold to a Dutch physician, who tried to follow the Chamberlen idea. However, a French surgeon, named Jean Palfyn, introduced another midwifery forceps about the year 1700 and, unlike the Chamberlen family, he laid his model before the Paris Academy for the benefit of the medical profession generally.

In spite of all these advances in midwifery—Podalic Version, Cæsarian Section, and the forceps—pregnancy was still taking an enormous toll of the lives of women during labour. This was due to the infection following labour or, as we

call it, Puerperal fever. The mortality from this cause was appalling—something like 25 per cent.

Ludwig Semmelweiss, born in Budapest about 1818, did a lot of work in the University of Vienna on puerperal fever and sepsis, and discovered that the infection was often carried to the patient by the uncleanliness of the hands of the midwife and want of cleanliness in the preparation of the patient. He found that by using chlorate of lime for disinfection of the hands, his mortality from puerperal sepsis greatly diminished. He and several others of that time, including workers in England and America, sought hard to discover the cause of infection, and it was about the year 1845 that the great and distinguished French chemist, Louis Pasteur, made a discovery that was to revolutionize the whole system of surgery. He discovered that the cause of infection and the formation of pus was due to living organisms or bacteria, which were only visible with the aid of a microscope.

Lister (born 1827), the son of a Quaker, became Professor of Surgery at Glasgow University, and it is to his work on the destruction of bacteria that we finally came to control infection. He searched for a chemical substance that would kill them, and discovered the properties of carbolic acid in this direction. Hence was born antiseptics.

The important discoveries of Pasteur and Lister opened up a new road to surgery and, of course, obstetrical surgery. It was now possible to prepare the site of operation thoroughly, and the work could be carried out with antiseptic precautions. The operation wounds now healed and the mortality rate fell considerably.

Anæsthetics.

Another great advance in the practice of midwifery occurred about this time. I refer to anæsthetics.

Sir James Simpson became Professor of Midwifery at the University of Edinburgh, and in 1847 he discovered the anæsthetic properties of chloroform. He tried it out with great success in a confinement case, and published his results. He was met with a torrent of abuse. The use of chloroform was generally denounced from the pulpit. The Scottish clergy especially were vehement in their attack upon the morality of using anæsthetics for the relief of pain at time of birth, and only after a long struggle, in which the Queen of England took an active part by allowing herself to be anæsthetized at the birth of her son Edward VII, was relief from the agonies of child-birth considered as reconcilable with the Christian faith.

Now I intend to bring my paper to a close, as it was not my intention to touch on the subject of modern midwifery practice, and so let me thank you all, ladies and gentlemen, for the patient way you have listened to a drastically cut and, I am afraid, rather boring paper.

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Parergon

By Professor J. H. Biggart, c.b.e., m.d., d.sc.
Dean of the Faculty of Medicine,
The Queen's University

Opening Address, Winter Session, 1949- 1950
Royal Victoria Hospital Belfast

My first duty must be to welcome to this hospital the new generation of students. Each year brings to its wards a stream of new life. Those who have gone before you have built up the traditions of the century which you now inherit, but those of you here to-day have the peculiar privilege of not only maintainng the traditions of the past, but also of initiating those of the new century. It is for you to carry on the task, sustained by the vision of medicine as it is yet to be. Yet, if it was the youth Samuel who had the vision, it was the old man, Eli, who was able to interpret it, and it is in this combination of youth and age, of vision and experience, that we together, teachers and taught, but always fellow students, enter upon this first year of a new century in the life of the University.

Yet we regret that this fellowship of teacher and student should this year have suffered grievous loss and its erstwhile perfection be marred by the deaths of Sir Thomas Houston and of Dr. Foster Coates.

For over half a century Sir Thomas was associated with our hospital and teaching school. He gave his life to medicine, resolved to—

> "Cease not, till day streams to the west, then down
> That estuary, drop down to peace."

You have lost the benefit of his inspiration : we of the staff a friend.

To his teaching and practice Dr. Coates brought great gifts of keen observation and commonsense. Every student who passed through his unit was rendered thereby a better practitioner of medicine. Osler's text-book was as a Bible to him and no one taught better the difficulties of medicine in general practice.

The medical profession attracts to itself a great variety of men and women stimulated by the most diverse of motives. Somehow in their years of training they obtain the stamp of Queensmen and Queenswomen and go forth from us capable in the art of medicine and imbued with love of their profession. This is an age of plannng, and though I believe that each of us should remain sufficiently elastic to meet any set of circumstances, yet it is a good thing to pause at the entry to your careers and endeavour to appreciate the aims and objects which each one should have in view. For Osler a knowledge of disease and its cure was not enough. Knowledge of self was equally, if not more, important. Knowledge of disease and its cure you will learn from your teachers and from your experience in the out-patient departments and the wards. Knowledge of self is more difficult

to obtain. The field of medicine is so vast, the variety of disease and its symptoms so manifold, and the human problems you will encounter so varied that there is no branch of learning which may not be of help. Mere technical proficiency is not enough. There are those who believe that, as science develops, medicine will become more and more a technology and that eventually a purely technical presentation and training will be sufficient. The graduates of the past century bear witness against this fallacy, and we can but hope that the graduates of the new century will continue not only to apply what is best in our art, but will also continue to show that consideration for the weak, pity for the suffering, and charity to all which has ennobled the profession. Much of what you need forms no official part of your course and you must seek it for yourselves. A study of science will increase your powers of discernment; of literature, music, or art, your powers of appreciation and finer feeling. The wider your education, the greater the knowledge of self, the more easily will you make contact with the sentient entity that is your patient, and the better a practitioner you will be.

There is in Egyptian mythology the story that the body of the virgin Truth was cut into a thousand parts and scattered. "From that time ever since," writes Milton, "the sad friends of Truth, such as durst appear, imitating the careful search that Isis made for the mangled body of Osiris, went up and down gathering up limb by limb still as they could find them." We have not found them all yet, and many of them lie in other fields of culture than those of medicine.

The story of medicine is illumined not only by numerous practitioners who studied outside the bare skeleton of medical facts, but who oftimes became contributors to other and broader fields of culture. So I have chosen for the title of this address—"PARERGON"—or work that is done over and above the daily round.

In all the learned professions there are men who have turned to some other vocation. It has been claimed for medicine—by one of ourselves—that it stands foremost among the professions in the number of its practitioners who have become distinguished in the arts. There is reason why it should be so, for Æsculapius, the god of the healing art, was in Greek mythology fathered by Apollo, the god of culture, and, though we may be disciples of Æsculapius, we are also the votaries of Apollo. Some, though bidden to follow Apollo, continue to practice their profession. Others become truants to medicine. In his Linacre lecture Lord Moynihan gave almost one hundred names of such truants. Dana collected poetical works written by medical men, and produced a collection of 157 names and over 295 works. More recently McDonough has produced a volume containing 411 names of medical poets. Prose writers abound. Amongst moderns there are James Bridie, A. J. Cronin, Warwick Deeping, Somerset Maugham, Francis Brett Young, and de Vere Stacpoole. Others have wandered into adjacent fields of science, of theology, or of statesmanship.

Amongst this wealth of truants Northern Ireland has not been unknown. Exactly one hundred years ago, in 1849, when the gates of Queen's College were about to open, there died in Lisburn, Dr. Thomas Hancock. Born of Quaker parents

in the south of County Antrim in 1783, he was apprenticed to a surgeon in Waterford. Like so many of his contemporaries, he took his systematic course in Edinburgh, and graduated there in 1809. He was particularly interested in epidemic disease, publishing a thesis on "De Morbis Epidemicis" and a book of Researches into the Laws and Phenomena of Pestilence, including a medical sketch and review of the Plague of London in 1821. This book was well received, being regarded as the best on the subject. Writing before the discovery of bacteria, he considered that "condensed human effluvia, the product of local filth, and crowded ill-ventilated houses, are connected with the origin of all epidemic plagues, and their dissemination has been generally in proportion to the extent of these local causes," and counselled "calmness and regularity : patience under difficulties, careful ablution : a full and rather generous system of diet, under the guidance of temperance in everything," believing that these would prove "better prophylactics and antidotes to the disease, than can be supplied by all the well-stored magazines of health and boasted implements of our art." It is of some local interest that he describes the experience of a Belfast physician in 1809, who informed him that in the course of four months there were between two and three hundred persons admitted to the Belfast Fever Hospital and that "they were frequently so crowded in the wards, as nearly to cover the floor with their beds : in which case, although the building is new, airy, and well regulated, the matron, twenty-two nurses, and the apothecary took the disease." "With regard to most of these things," he concludes, "our science appears to be in its infancy," but "where there is a strong predisposition, it is natural to conclude that morbid effluvia from the diseased to the sound must assist in propagating the mischief, by acting as a powerful exciting cause." There is occasionally almost a prophetic touch, as when he writes : "The path of Discovery is without doubt still open in various directions, to reward the cautious and perhaps the bold adventurer. Accident may indeed discover at some happy moment what has eluded the most learned and diligent research. But the observation must on the whole be deemed correct, that medicine has not hitherto received any notable improvement by speculation, nor is it likely to be advanced as a science but by the slow but very humble progress of experience." Or again he anticipates Professor Cuming, famous in the old Frederick Street Hospital, "the high priest of philosophic doubt," as the late Sir Robert Johnstone called him. "Therefore," writes Dr. Hancock, "however splendid the talents, and excellent the qualifications of a physician may be, there is in my opinion no profession which demands a greater share of what may be termed philosophical diffidence than that of medicine."

Thomas Hancock practised in London and was elected physician to the City and Finsbury Dispensary. There are a number of articles by him in the Belfast Monthly Magazine in 1810 dealing with Lunatic Asylums. In 1832 he moved to Liverpool and in 1838 returned to Lisburn, where he spent the last thirteen years of his life. His Quaker beliefs influenced his literary production. He published an "Essay on Instinct," "An Elegy supposed to be written on the Field of Battle," "The Law of Mercy," a poetical essay on the punishment of death, and in 1825

his most valuable work "Principles of Peace exemplified in the conduct of the Society of Friends in Ireland during the Rebellion of 1798." As the Society of Friends played no part in this rebellion and took no side, this volume represents the most impartial of the descriptions of that turbulent period.

In 1947 there retired to Portglenone Dr. Richard Hunter, Secretary of Queen's University, sometime lecturer in Anatomy, Artist, Medical Author, and Circus Impresario. In 1756 there was born in Portglenone one William Babington, who, following an apprenticeship to a physician in Derry, completed his medical studies at Guy's Hospital and became assistant surgeon to the Haslar Naval Hospital. There he served four years, when he obtained the position of apothecary to Guy's and lectured on chemistry. He obtained the degree of M.D. from Aberdeen in 1795, and returning to London was elected physician to Guy's Hospital. By special grace he was elected F.R.C.P. in 1827, and in 1831 an Honorary M.D. of Dublin University. Though he was a successful physician, his interest lay in mineralogy. "If in the course of his life," writes Dr. Munk, "he made no conspicuous addition to the science of medicine it was that his energies were devoted to the sciences of chemistry and mineralogy." He was, according to the evidence available, the founder of the Geological Society and certainly was its president in 1822. He contributed little original research, though he catalogued the rich collection of minerals belonging to the Earl of Bute, but did much to encourage scientific endeavour in others. He was elected an F.R.S. and took part in the foundation of the Hunterian Society. His son also became physician to Guy's, whilst his daughter became the wife of Richard Bright, whose name is perpetuated in diseases of the kidney.

A contemporary of Babington's was Thomas MacLear of Newtownstewart. He was, like many of us, intended for the Church, but refused to continue his studies. Born in 1794, he was sent to England in 1808 to be educated for the medical profession. He also studied at Guy's Hospital and was successful in obtaining his F.R.C.S. Appointed house-surgeon at the Bedford Infirmary, he became acquainted with Admiral Smyth, who infected him with a love of astronomy. Though continuing to practise medicine in partnership with his uncle, he evidently maintained his interest in astronomy and acquired some reputation in the subject for the accuracy and wealth of his observations. Indeed, at one period the Astronomical Society lent him the Wollaston Telescope and set it up in his garden. The quality of his work must have been impressive, for in 1833 he was appointed Astronomer Royal at the Cape of Good Hope. Here he continued his studies and compiled a vast amount of observation. He became an intimate friend of Livingstone, and may be said to have contributed to the latter's journeys of exploration in Africa, for it was MacLear who instructed the explorer in the use of the sextant. He was knighted in 1860 and died in 1879.

To those of you who know the history of this Medical School and the part played by the Royal Belfast Academical Institution, there will be an interest in James Sheridan Knowles. Born in Cork, he quarrelled with his mother, ran away from home, and joined the militia. Next we hear of him in Aberdeen, where he

graduated M.D. For a short time he pursued the practice of medicine and was attached to the Jennerian Institute as vaccinator. At the foundation of 'Inst' he was offered the headmastership of the English Department, but declined in favour of his father, to whom he became assistant. His heart was not in medicine, and he was attracted by the stage. Play-writing was his real love, and possibly his appointment as Teacher of Elocution at Inst was an expression of this same interest. His play "Caius Gracchus" was produced in the Theatre Royal—now the Royal Cinema in Arthur Square—in 1815, but he sought wider fields to conquer and in 1817 he left Belfast for London. There he produced a number of plays and was described by Hazlitt as "the first tragic writer of his time." For his contributions to the stage he was granted a civil list pension of £200. He died in 1862.

Better known, however, than any of these is Sir Hans Sloane. Born in 1660 in Killyleagh, he studied medicine in London, graduated at the University of Orange and eventually rose to be not only a celebrated physician, the friend of royalty, but also President of the Royal College of Physicians and President of the Royal Society. Infected early in life with a love of natural history, he acquired an enormous collection "fifty volumes in folio scarce sufficing to contain the catalogue of this immense museum consisting of above 200,000 articles." By his will, his executors offered the collection to the King for £20,000, and so, as Professor W. W. D. Thomson put it in his Presidential Address at the Ulster Medical Society in 1937, "The vision of a young Ulsterman and the dreams of his old age gave England the British Museum."

Astronomer, author, collector, geologist, and playwright constitute a sufficiently varied output from the medical graduates of such a small area, but amongst the greatest must be numbered two doctors of local origin who became outstanding chemists.

Business interests took John Black, a native of Belfast, to Bordeaux, whence he contributed to the education of the palate of his contemporaries. There, in 1728, a son, Joseph, destined to become one of the most eminent men of his generation, was born. At the age of 12 years he was returned from France to the sterner climate of Belfast. Here he embarked upon his education. After six years of schooling at a private grammar school he was sent to Glasgow University, and four years later to Edinburgh. In both he pursued the study of medicine, though a paper which he presented to the Medical Society of Edinburgh in 1756, whilst still an undergraduate, may be said to have laid the foundation of quantitative analysis. He demonstrated the fact that many substances were a combination of various elements with "fixed air." In 1756, at the age of 28, he was offered and accepted the Chair of Anatomy and Chemistry in Glasgow, but soon transferred to the Chair of Medicine, which he occupied for ten years. Simultaneously he conducted a large practice and embarked upon scientific experiments of fundamental importance. During this period he discovered "Latent Heat." In 1766 he was appointed Professor of Medicine and Chemistry in Edinburgh, whilst his merit as a practitioner of his art was recognised by his appointment as First Physician to His Majesty for Scotland. He was a gifted lecturer, expounding complicated

problems with great clarity, so that his lectures became extremely popular and were attended not only by serious students, but also by the fashionable intellectuals of his day. It is difficult to realise that he was prevented by indifferent health from attaining to his full powers, for he accomplished more than most men. He was acknowledged as the greatest chemist of his day, and Lavoisier was proud to call himself a disciple. He died in 1799.

The other, Thomas Andrews, pursued a more local career. Born in Donegall Square, Belfast, in 1813, he was educated at the recently opened Royal Belfast Academical Institution, and subsequently studied at Glasgow, Paris, and Dublin, graduating M.D. in Edinburgh in 1835, the very year in which the Medical Faculty of the Belfast Medical School was instituted. His first appointment was as Professor of Chemistry in the newly founded Faculty, but, like Black, he also opened a private practice in the neighbourhood. Ten years after his acceptance of the chair in 'Inst' the new Queen's College was granted its Charter, and Andrews appointed its first and only Vice-President. When in 1849 the new college was opened he became its first Professor of Chemistry and served his new allegiance until his retirement thirty years later. He was successful in combining teaching, research, and administrative work, gaining wide renown for his discoveries relative to the critical temperature of gases, and the continuity of the gaseous and liquid states of matter. A Fellowship of the Royal Society and Honorary Degrees in the Universities of Edinburgh, Glasgow, and Dublin show that his reputation, which still persists amongst us, was more than merely local. Unlike Black, he became a truant to medicine, and from the time of his appointment to Queen's College he devoted himself entirely to chemistry. It is said that some of his most crucial experiments were performed beneath the laburnum tree which still somewhat precariously persists in the quadrangle of the University, and which in these modern days appears to offer shelter more often to adventures of the heart, than to those of scientific discovery.

Yet, whilst these are outstanding examples of medical graduates who have made their name in the subjects outside medicine to which they were attracted, there is a multitude of men who have continued in their profession and continued to utilise the knowledge gained from hours of truancy in other fields to further their proficiency as interpreters of humanity and healers of human suffering. Even if we confine ourselves to roughly the same period as produced the few I have already mentioned, we find men like Dr. James McDonnell, the founder of this hospital and medical school; Dr. Henry MacCormac, the first Professor of Medicine; Dr. Robert McGhee, Dr. S. M. Stephenson, Dr. S. S. Thompson, and Dr. William Drennan, all continuing to practice their profession, but endowing their fellow townsmen with the benefit of their culture, and leaving behind a record not only of the good medical life, but also of the good life.

It would be wrong if I were to give the impression that Olympus reared its head in these early days of the nineteenth century only in our own island or in this favoured province. I merely thought it but right that, on the threshold of a new century of endeavour, we should for a few minutes pause in the rush of work

to "call to remembrance what acts our fathers did in their time," and to join hands with the men of our own stock who were active in the days of our foundation; whose traditions we inherit; and whose lives continue to be an inspiration to us. These men were not of our medical school, because there was in their day no such institution. If there had been, there is little doubt that, as well as being fellow medical practitioners, fellow Ulstermen, we might have also hailed them as fellow Queensmen.

However, outside in the greater world similar men lived and died, contributing to their profession, or, truants to medicine, enriching life in other ways. Even to mention them would produce a lengthy catalogue of scientists, litterateurs, architects, and artists, with an occasional rara avis like Dover of the powder, author of a text-book of medicine, privateer and discoverer of Alexander Selkirk, the prototype of Robinson Crusoe, or Oliver of Bath, whose contribution to humanity was a bun.

In such a catalogue an honoured place would be found for a whimsical personality whose sayings and writings were familiar to the older generation—Oliver Wendell Holmes. In fact I am not sure that he is read at all by the younger generation, and yet his life presents such a combination of solid accomplishment in his profession, compounded with a clever wit, an intense humanism in literature, with a drop of the pixie in his poetry, that he must remain a rather unique member of our profession. Last, but not least, for my purpose this morning, his life spans the years of the inception, the creation, and the stabilising of our own medical school.

Born at Cambridge, Mass., in 1809 in the Old "Gambrel-roofed House," he was a son of the manse. Brought up in an atmosphere of Calvinism, he was intended for the Church. "I might have been a minister myself," he was to write in later years, "if a certain clergyman had not looked and talked so like an undertaker." His undergraduate studies were at Harvard College with the class of 1829, which he made famous by a series of occasional poems written for their annual reunions. He seems to have lived much the same life as undergraduates in general. Wine was not unknown to him. Parties in his rooms were as undergraduate as such parties usually are. His letters abound in references to charming young women. "I do believe I shall never be contented," he writes, "until I get the undisputed mastery of a petticoat." That was in 1830. In 1831 he is still thinking of "the pretty little hand which I held so quietly but a very little while ago—and the girl who was silly enough to let me." These statements remind one of Osler's: "What is a student but a lover courting a fickle mistress who ever eludes his grasp." In Osler's case, however, the "fickle mistress" happened to be the great abstraction "Truth." Holmes, nevertheless, had sense enough to postpone his undisputed mastery for ten years, and it was not until 1840 that the pretty little hand of Amelia Lee Jackson finally refused to be squeezed and cast aside. After receiving his Bachelor's degree he embarked upon a study of the law, but found it unattractive. "I know not what the temple of law may be to those who have entered it, but to me it seems very cold and cheerless about the threshold." One year in the law school was sufficient, and in the ensuing

session we find him enrolled as a medical student. He was now twenty-one, and his entry into medicine was accompanied by his entry into literature. Reading that the frigate "Constitution"—the Victory of America—was to be destroyed, he dashed off a poem with a pencil—"Old Ironsides." The poem stirred the patriotism of the young nation and Old "Constitution" was saved. Following two years as a medical student in a private school in Boston, he embarked for France, where, for the next two years he studied in Paris. Here he came in contact with Louis, one of the greatest physicians of the age; with Baron Larrey, who had been the favourite surgeon in the armies of Napoleon; with Ricord, the gynæcologist; and with Lisfranc, another of the surgeons of Napoleon. Paris, indeed, was at this time the medical centre of the world. Louis was one of the first great teachers of the correlation of symptoms with pathological findings, and his researches into typhoid and phthisis made important advances. His writings and teachings possessed great influence, particularly in America, and Holmes was following in the footsteps of Gerhardt and many other American physicians when he sat at his feet.

His letters home reveal some interesting opinions of his teachers. "The vivacious Ricord, whom I remember calling the "Voltaire of pelvic literature"—a sceptic as to the morality of the race in general, who would have submitted Diana to treatment with his mineral specifics and ordered a course of blue pills for the vestal virgins"; Lisfranc, "who regretted the splendid guardsmen of the Old Empire, because they had such magnificent thighs to amputate." The general surgeon may have become somewhat more of a physiologist with the passing of the years, but the psychology of gynæcologists appears set fast in their tradition! For Louis there is nothing but praise. He taught "no doctrine but nature and her laws, pointed out at the bedside for those to own who see them, and for the meanest student to doubt, to dispute, if they cannot be seen: he has examined the dead body oftener and more thoroughly in the course of a year than the vast majority of our practitioners have in any ten years of their lives." Yet, studying in Paris was expensive and he was keen that his studies should not be curtailed. "What better can be done with money," he writes to his parents, "than putting the means of instruction—the certain powers of superiority, if not of success—into the hands of one's children . . . A boy is worth his manure as much as a potato patch." His arguments were relatively successful and he stayed two years. "He took his work and he took his pleasure, but he took his work with all his might, and his pleasure very moderately." In fact he was a very satisfactory undergraduate. The time was not wasted and he enunciated three principles which he had learnt in Paris which are as sound to-day as they were in 1834. "Not to take authority when I can have facts; not to guess when I can know; not to think a man must take physic because he is sick."

In December, 1835, as the first medical lectures were being given in our own school, he sailed from Havre to continue his studies in Boston. In 1836 he obtained his degree of M.D. for a thesis on "Acute Pericarditis" and began the practice of medicine. According to Morse, his biographer, his chief pleasure in taking up the

practice of medicine was that it obliged him to keep a horse and chaise. In this awkward vehicle he loved to dash through the streets at a speed involving peril both to himself and to others. His practice did not grow rapidly. Indeed, at one period, he threatened to hang out a sign, "The smallest fevers thankfully received." After all, in the same year his first book of poems had been published, and the Puritans of New England were probably not attracted to the young practitioner whose pen abounded in such witticisms—"a man that wrongs his manliness by laughing like a boy." The award of the Boylston Prize in 1836 and 1837 for essays on "Neuralgia" and "Direct Exploration in Medical Practice," and "Malaria" may have served to rehabilitate him in their eyes. For these essays he was forced to read much in the literature of medicine, and the knowledge thus gained is seen reflected in the pages of his subsequent writings, where he seems at home with the writings of the fathers of his profession. He was, however, too sympathetic to practice medicine and soon forsook the art for the science. In 1838 he helped to establish a private school of medicine in Boston—the Tremont Street Medical School, and in 1839 and 1840 acted as Professor of Anatomy at Dartmouth College. During the next few years he contributed several medical papers—the first an eloquent attack on Homœopathy, the second on "The Contagiousness of Puerperal Fever (1843)" The second of these two papers was read before the Boston Society for Medical Improvement. It was not the result of individual research, but rather a review of recorded cases assembled from many sources and analytically and logically considered. It must be remembered that this was before the days of Pasteur and our modern ideas about bacteria. Many years later he was to write, "I am pleased to remember that I took my ground on the existing evidence before the little army of microbes was marched up to support my position." No previous article had presented the evidence for contagion so convincingly, and, as his conclusions were presented with some feeling, his oponents naturally attacked them. Two of the most distinguished professors of obstetrics were foremost in this attack. Writing of the students of these professors we have Holmes at his best : "They naturally have faith in their instructors, turning to them for truth, and taking what they may choose to give them : babes in knowledge, not yet able to tell the breast from the bottle, pumping away for the milk of truth at all that offers, were it nothing better than a professor's shrivelled fore-finger." Is it any wonder that Holmes' viewpoint prevailed?

In 1847 he was appointed Parkman Professor of Anatomy and Physiology in Harvard University. He possessed great gifts as a lecturer and his colleagues soon apportioned to him the one o'clock lecture which followed upon four other lectures. It took a lecturer of more than ordinary attraction to hold the attention of jaded students, but it was no ordinary lecturer who compared a sweat-gland to a fairy's intestine or described the lower portions of the pelvis as "the tuberosities of the ischia, on which man was designed to sit and survey the works of creation." He believed and practised that the only way of teaching a whole class was by enormous repetition, representation, and illustration in all possible forms.

He was Dean of the Medical School from 1847 to 1853. He was one of the early

medical microscopists. As a professor he had a kindly reputation, and the story is told that when a student presented himself for his examination the Professor asked him to describe the nervus petrosus superficialis minor. When the student was able to do so quite accurately the Professor exclaimed: "If you know that, you know everything! Now tell me about your dear old father."

Two years after he joined the Harvard School Professor Parkman was murdered by Professor Webster, the Professor of Chemistry. Whilst investigations were on foot every teacher of the school, including Holmes, was suspect, but his wife was able to provide an alibi.

In his first decade at the school ether was first used as an anæsthetic, and the following letter from Holmes to Morton, the dentist who demonstrated its use, serves to show what part Holmes had in it.

"My dear Sir,

Everybody wants to have a hand in a great discovery. All I will do is to give you a hint or two as to names—or the name—to be applied to the state produced, and the agent.

The state should, I think, be called "Anæsthesia." This signifies insensibility more particularly to objects of touch.

The adjective will be anæsthetic. Thus we might say the state of anæsthesia or the anæsthetic state. The means employed would be properly called the anti-æsthetic agent. Perhaps it might be allowable to say anæsthetic agent, but this admits of question.

The words anti-neuric, aneuric, neuroleptic, neuro-lepsia, neuro-stasis, etc., seem too anatomical; whereas the change is a physiological one. I throw them out for consideration."

In 1871 a separate chair of Physiology was created, and thereafter until 1882, he devoted himself entirely to anatomy.

Yet, though Holmes was a competent professor, a brilliant and witty lecturer, he made little advance in medicine. His paper on the "Contagiousness of Puerperal Fever" stands as his main contribution, and it is rather as "the most successful combination the world has ever seen of the physician and the man of letters," that his name survives.

In the early days of his medical life it was chiefly as a poet that he became known, and, in the main, as a poet of the occasional verse for the dinner party or the annual reunion. Though showing a clever ability, few of his poems are great verse. He himself preferred the "Chambered Nautilus" ending:—

"Build thee more stately mansions, O my soul,
As the swift seasons roll
Leave thy low-vaulted past
Let each new temple, nobler than the last,
Shut thee from heaven, with a dome more vast,
Till thou at length are free,
Leaving thine out-grown shell by life's unresting sea."

Yet there is something peculiarly appropriate to himself in "The Last Leaf":—

"And if I should live to be
The last leaf upon the tree
In the spring,
Let them smile as I do now
At the old forsaken bough
Where I cling."

for he was to live to see all his friends—Emerson, Hawthorne, Whittier, Agassiz, Longfellow—depart. Most of his poems are in a lighter vein and of them the Deacon's Masterpiece or "The Wonderful One-Hoss Shay" takes pride of place.

In 1857 the Atlantic Monthly was founded, and he began the publication of the three books of the Breakfast Series—The Autocrat, the Professor, and the Poet—upon which his fame as an author largely depends. Those of you who find delectation in the whimsicalities of Charles Lamb will here find the same tender sensitiveness embellished by a smile for the foibles and a tear for the sorrows of their fellow creatures! Often has he been called the American Goldsmith, and it is to the race of the ever young that Goldsmith, Lamb, and Holmes belong. These books you must read for yourselves. Perusal of the Autocrat in particular will give you an insight into what Holmes really was like, and many of his better poems are scattered through its pages. All of them shed light on his ability and character, for they are full of self revelation. One quotation from "Soundings from the Atlantic" (1864), will let you see him through the spectacles of his landlady.

> "This gentleman warn't no great of a gentleman to look at. Being of a very moderate dimension—five foot five he said, but five foot four more likely, and I've heard him say he didn't weigh much over a hundred and twenty pound. He was light complected rather than darksome, and was one of them smooth faced people that kept their baird and whiskers cut close, just as if they'd be very troublesome if they let them grow—instead of laying out their face in grass, as my poor husband that's dead and gone used to say. He was a well behaved gentleman at table, only talked a great deal, and pretty loud sometimes, and had a way of turning up his nose when he didn't like what folks said."

It has been said, indeed, that Holmes was his own Boswell. He was a most charming talker, and there are those who would have it that his conversation was the best part of him. Charles Kingsley once called him "an inspired jackdaw." In many ways he is a suitable subject for to-day's address, for he was a warm believer in youth and in the future which they were to build. To a graduating class of medical students he once said: "Revolutions are not made by men in spectacles and the first whisper of a new truth is not caught by those who begin to feel the need of an ear-trumpet." His writings are very definitely influenced by his medical knowledge. "He is alone," writes Chesterton, "in combining those verbally similar but profoundly diverse things, a knowledge of the cosmos, with a knowledge of the world." He died in 1892.

There are some who believe that medicine is an all-consuming profession; that its study is more than enough to engage the full time of its serious students; and

that those who seek "the verdant ways and winding mossy paths" of other cultures are thereby rendered dilettantes in their chosen profession. From a purely scientific viewpoint this may be quite true, for the search for truth is limitless and "He that loveth father or mother or son or daughter more than Me is not worthy of Me." Yet mere knowledge of medical science is not in itself enough to ensure the development of the good practitioner of the medical art, and without knowing much of science you may have the knowledge of life, which makes anything you do of value to the community. A little truancy into that adjacent field of culture will bring reward in the assurance that there is a quality as well as a quantity of life.

Holmes advised his students to look again at the aphorisms of Hippocrates. The merit of the Father of Medicine was to begin with the patient rather than the disease—to see him in his environment, to understand how the internal environment of the body was influenced by climate, by water, by soil, and by all those things that constitute the external environment. In the Laws, Plato regarded physicians as educators—physicians who were wise in collaborating with Nature, helping the patient to play his own part in this collaboration. For this the physician required that "education in virtue from youth upwards, which enables a man to pursue the ideal perfection." Such knowledge is not readily attained by even the broadest study, and certainly not within the necessarily confined limits of a curriculum. Many kinds of knowledge have the role in life that vitamins have in the diet, and nothing that throws light on life is alien to the study of medicine. As Goethe has it, "who brings much will surely bring someone something."

Robert Bridges, one who became a complete truant from medicine, was convinced that he could be a better poet if he became a doctor and so came directly into contact with human life. At the age of 85 he published his "Testament of Beauty," which has been described as the "first great didactic poem of æsthetic philosophy" worthy to rank beside the De rerum naturæ of Lucretius. There you will find much of what I have tried to say :—

> "Science, they will say,
> knoweth naught of this beauty. But what kenneth she
> of colour or sound? Nothing : tho' science measure true
> every wave-length of ether or air that reacheth sense,
> there the hunt checketh, and her keen hounds are at fault;
> for when the waves have pass'd the gates of ear and eye
> all scent is lost : suddenly escaped the visibles are
> changed to invisible : the fine measured motion to
> immeasurable motion."

You, who are entering the wards of this hospital, are also embarking upon a life very different from that of your teachers. From much that was hallowed for them by beauty, custom, and tradition the glory has departed. There is abroad an abdication of personal responsibility. "Individual worth," once "the high goal of our great endeavour," is mersed in the communal good. The commonsense of biological law crumbles before an ideology. Though the traditions of medicine remain, its practice has changed, and the hospital erected for the succour of the suffering poor now opens its doors to all. The youth embarking upon this turbulent

sea must possess a balanced personality. There have been as difficult problems before, and men have arisen to overcome them and to guide the evolution of the art of healing. Medicine is a speciality, but the youth who to-day is called upon to practice it must be a whole man. Education, discipline, daily routine must each tend towards the development of this wholeness. A hundred years ago a medical poet was writing :—

God give us men ! A time like this demands
Strong minds, great hearts, true faith and ready hands;
Men whom the lust of office does not kill :
Men whom the spoils of office cannot buy :
Men who possess opinions and a will :
Men who have honour—men who will not lie :
Men who can stand before a demagogue,
And damn his treacherous flatteries without winking !
Tall men, sun crowned, who live above the fog
In public duty, and in private thinking.

And so we come back to the idea that wholeness is necessary, and for this wholeness knowledge of self is essential. As such, it was appreciated by Osler. "Know thyself," says the Bible. "Know thyself" runs through the whole gamut of Greek culture, when the balance of life was most nearly achieved. Thales uttered it; Hippocrates formulated it; the Delphic Oracle inscribed it over the gates of the Temple; Socrates taught it. Knowledge of self can only come to the medical student through "parergon," but with such knowledge the traditions of our profession, the traditions of our school, the welfare of our fellow men are in safe keeping.

"The skill of the physician shall lift up his head :
And in the sight of great men he shall be in admiration."

And so we welcome those of you, who are strong enough to come, to a great struggle and hand over to you the keeping of our medical faith. In so doing we hope that you will go forth eventually from these wards into the years of the new century in the attitude of the pilgrims :—

We are the Pilgrims, Master, we shall go
Always a little farther.

(I am indebted to Miss Jean Webster of the University Library for her help with the literature.)

REVIEW

AIDS TO SURGICAL NURSING. By K. F. Armstrong 5s.

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The Evolution of a Social Obstetric Conscience

By Professor C. H. G. Macafee, M.B., F.R.C.S.(Eng.), F.R.C.S.I., F.R.C.O.G.

The story of great achievement in any community is, in general, the story of those men and women, who, by patient industry and prodigious labours, have in their day and generation made notable contributions to its life and work.

Therefore, in this inaugural address—subsequent to the honour I have received in being called to the Chair of Midwifery and Gynæcology in this University—I take the earliest opportunity of paying my sincere and humble tribute to those of outstanding character and ability, who, in the years that have gone, laid here the foundations and built up a great teaching school in this particular branch of our medical profession. Well may it be said of them that they builded better than they knew, and, in recalling their work, I am not unmindful of Bacon's advice to "use the memory of thy predecessors fairly and tenderly; for if thou dost not it is a debt will sure be paid when thou are gone."

The Queen's University of Ireland, with its three constituent colleges in Belfast, Cork, and Galway, was founded, as recent events here have reminded us, in the year 1849. Between that year and 1945 there were four Professors of Midwifery and one Professor of Gynæcology in the College and University. Thus, despite the arduous nature of the work, the average term of office for the Professors of Midwifery has been twenty-four years.

In the foundation year, 1849, William Burden was appointed to the Chair of Midwifery. He retired in 1867.

Burden was a remarkable man, endowed with those qualities of enthusiasm and tenacity of purpose which are so essential to the first occupant of a chair. He strove vigorously and persistently in the interests of patients, medical students, nurses, and of the maternity hospital, and he carried out reforms in the face of narrow-minded opposition.

To attempt to recount in detail the story of William Burden's career would be, in the time at my disposal, an impossible task; the period, however, in which he exercised authority in this School is most interesting and amusing.

Much was accomplished during the eighteen years of his professoriate. He secured the admission of medical students and nurses to the maternity hospital of that time; he arranged and supervised their training and instituted a visiting medical staff. One suspects, however, that he must have made a number of enemies in spite of, or perhaps, indeed, because of, his great achievements, for he was permitted to retire from the maternity hospital without a single expression of regret from any quarter; even the President of the Queen's College in that year's report omitted any reference to Burden's retirement.

But I suppose we should remember that "Ingratitude towards their great men," says Plutarch, "is the mark of strong peoples."

The portrait of William Burden now occupies a place in one of our inconspicuous retiring rooms in this University. Although of no great artistic merit, one feels, nevertheless, that as a token of our appreciation of his great work as first Professor of Midwifery, his portrait should adorn the walls of the Great Hall.

Professor Burden's distinguished successors, Dill and Byers, worked during a most difficult period in this School.

Although Robert Foster Dill commenced his career as a member of the Maternity Hospital staff, yet during his whole time as Professor of Midwifery he had no connection with that institution, and therefore had the utmost difficulty in training his students, being obliged, indeed, to return to the methods practised by William Smellie about 1739.

John William Byers, who was in later years to be honoured by his sovereign with a knighthood, had been Professor of Midwifery for nine years before he was appointed to the staff of the Maternity Hospital, and even then his appointment was only at a junior level. This somewhat peculiar arrangement added considerably to his difficulties as a teacher. Thus, for about thirty-four years the Chair of Midwifery and the only available teaching hospital were divorced—a position which we to-day would regard as inconceivable—and one which lowered the prestige of the School of Obstetrics in the eyes of our own students and many outside the School. It is regrettable to think that this unhappy division was the result of professional jealousy on the part of the colleagues of these two professors.

On the death of Sir John Byers in 1920 the Chair of Midwifery and Gynæcology was divided. Charles Gibson Lowry was appointed to the Chair of Midwifery, and Robert James Johnstone to the Chair of Gynæcology.

The separation of these two subjects has never found favour in British medicine, but on this occasion the division led to the most happy results. Loyal friends and colleagues of different temperaments and diverse interests, these two professors united in their efforts to improve the teaching and practice of midwifery and gynæcology. This effective union lasted until 1937, when Sir Robert Johnstone retired, for he too had received the honour of knighthood, whereupon the two chairs were re-united under the control of Professor C. G. Lowry.

Sir Robert Johnstone, affectionately known to all as "R. J.," was one of the giants of his time, and there were giants in those days. I was fortunate to have the privilege of being his assistant in the Department of Gynæcology, and for many personal reasons am deeply in his debt. With an acute intellect and remarkable skill, he could have been, had he so wished, the Moynihan of Gynæcology.

He had many interests outside his speciality, interests which he used to advance those of the Medical School and the University. As a member of the Senate and as Parliamentary representative of the University, he rendered outstanding service.

While still full of mental vigour and with the prospect of useful and important

work before him, his untimely death in 1938 was a great loss to the University and to the community in general.

In the twenty-five years from 1920-1945 Professors Lowry and Johnstone, and in later years Professor Lowry alone, worked with an enthusiasm undamped and undiminished by an opposition which recalls the era of Burden. This audience will appreciate my difficulty in paying a tribute to a man who is, I am proud to say, not only very much alive, but also a very great friend. My indebtedness to him as a teacher, guide, philosopher, and friend is so personal that I naturally find difficulty in referring to him and his work. Nevertheless, the debt which this Medical School owes to him is almost impossible adequately to assess. The Royal Maternity Hospital is one visible memorial to the work he accomplished during his occupancy of the Chair.

His services to midwifery and gynæcology have been recognised by his colleagues in London and in Edinburgh, where he has received Honorary Fellowships. His own University in this present year has recognised the value and importance of his work by conferring on him the Doctorate of Science Honoris Causa.

The improvements in obstetric and gynæcological teaching and practice in this School, and the recognition of these advances by other schools in the British Isles and in America, is primarily due to the twenty-five years effort of C. G. Lowry.

The title of my lecture may sound peculiar, but as my story unfolds I trust that the need and importance of public interest in obstetric practice will become apparent.

The art of obstetrics is age old, and the risks to mother and child as old as recorded history, but the science of obstetrics and the appreciation of the necessity for active measures to reduce the risks are of relatively recent origin.

Many factors contributed to this lack of social conscience, factors which may seem strange to a public accustomed to see all the details of a confinement portrayed in the cinema.

Secrecy, false modesty, and the exclusion of men from the practice of midwifery take pride of place in preventing progress.

The antipathy to male practitioners may have been due to the fact that childbirth was looked upon as a normal physiological function—a function at which only women should be in attendance.

It is known that Soranus in the second century taught and practised the care and assistance of women in labour, but this custom disappeared two centuries later, and for over twelve hundred years the practice of midwifery was not only ignored by the physician, but his participation in it was actually prevented by law.

This exclusion of men from the study of childbirth had risen to such fanatical heights that a Dr. Wertt of Hamburg, in 1552, put on the dress of a woman to attend and study a case of labour. On being detected he was burnt to death.

The first obstetrical clinic for teaching purposes was founded by Gregoire the Elder in 1720 at the Hotel Dieu in Paris. Men had been permitted to practise midwifery in France prior to this date, probably as the result of the example of Louis XIV, who had entrusted Jules Clement with the care of one of his mistresses

in 1662. It is from this period until the middle of the eighteenth century that the attitude towards the participation of men in midwifery gradually altered.

To assess the achievements associated with any particular period of history, one must take account of the surrounding circumstances.

In the first decades of the eighteenth century the death rate had risen sharply and had surpassed the birth rate. At one period the burials in the London area had been twice as many as the baptisms, but this dangerous trend was reversed between 1730 and 1760, and after 1780 the death rate fell rapidly. Both the rise of the death rate and its subsequent fall have been attributed in part to the growth and decline of the habit of drinking cheap gin instead of beer, but other causes contributed to this remarkable decrease in the death rate.

In the latter part of the seventeenth and early part of the eighteenth century public and personal hygiene were on a low level; smallpox was rife and an appalling infant mortality prevented any increase in the population. Doctors were few and their practice dominated by superstition and folklore. Midwifery was still regarded as an inferior branch of medical practice beneath the notice of physicians, or even surgeons. It was still regarded as the exclusive right of midwives, who, in the presence of difficulty, were so ignorant that they were of little use, and the physicians called to give assistance were little better, as they had not the necessary preliminary training and experience of normal cases.

The midwives were licensed by the bishops, and a godly, righteous, and sober life was of greater importance than a knowledge of the art of obstetrics.

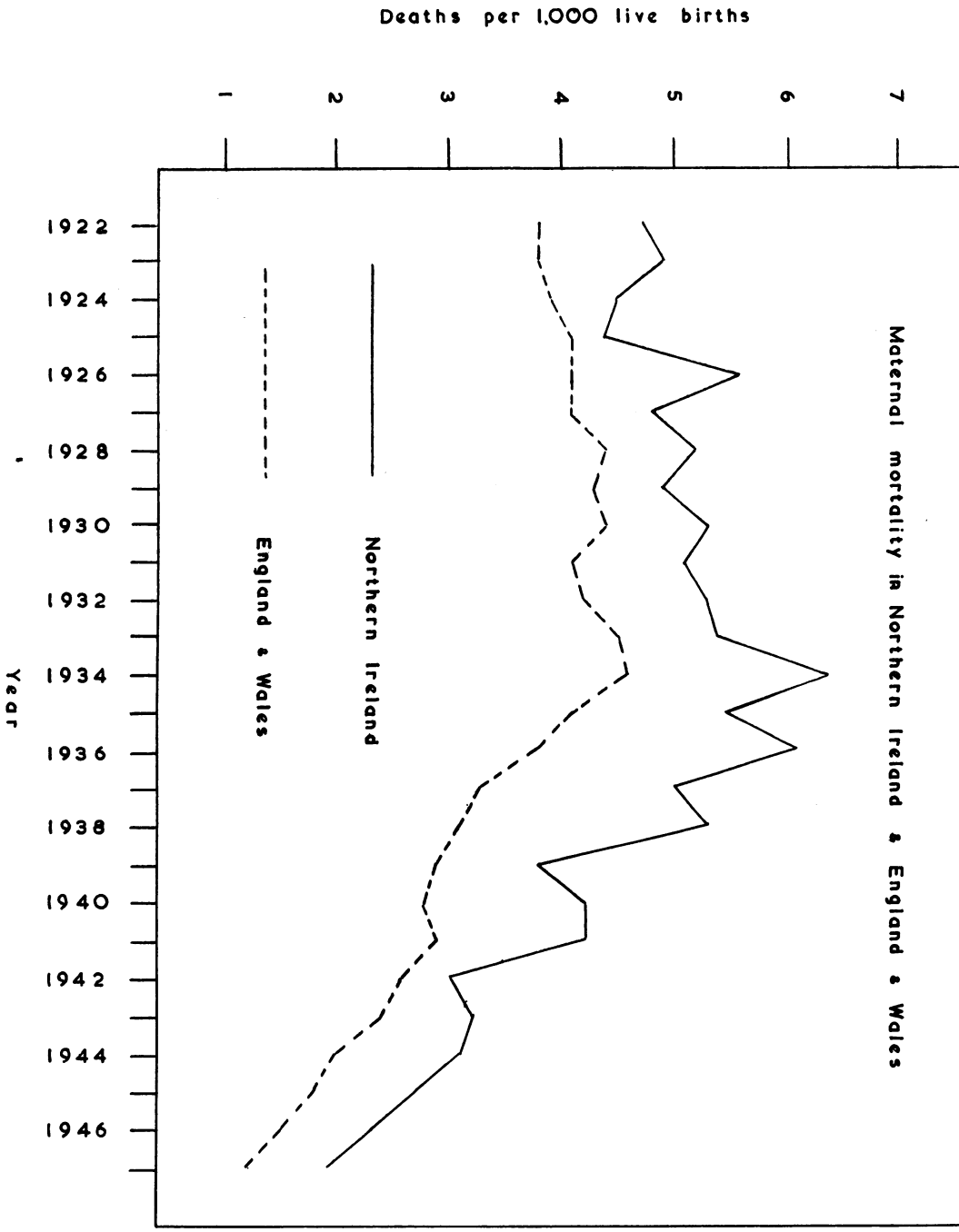
As early as 1616 Peter Chamberlin had petitioned James I: "That some order may be settled by the State for the instruction and civil government of midwives." It was not, however, until 1866, actually two hundred and fifty years later, that an attempt was made to control the untrained midwife, whose prototype was Charles Dickens' immortal Sairey Gamp.

When we consider the position of the doctor during the early eighteenth century in association with midwifery, we must remember that nearly two hundred years had still to pass before training in obstetrics was recognised as part of the medical curriculum. Any experience obtained was mainly involuntarily when summoned to assist a midwife in a complicated case.

Harvey's discovery of the circulation of the blood, and his writings on obstetrics in the middle of the seventeenth century, mark the beginning of the renaissance whereby the medical profession moved out of the dark ages of superstition into the light of science.

The forty years between 1740-1780 were years of relative peace between the religious fanaticisms of the past and the fanaticisms of class and race of the time to come. It was a period during which humanitarian and philanthropic feeling developed undisturbed by the anxieties of an era inaugurated by the Industrial and French Revolutions.

The appearance of William Smellie in London in 1739 revolutionised the practice of midwifery. Smellie, born in Lanark, 1697, was a Scotsman who believed that


Deaths per 1,000 live births
1
2
3
4
5
6
7
1922
1924
1926
1928
1930
1932
1934
1936
1938
1940
1942
1944
1946
Year
England & Wales
Northern Ireland
Maternal mortality in Northern Ireland & England & Wales

"the noblest prospect which a Scotsman ever sees is the high road that leads him to England," settled in London after a visit to Gregoire's clinic in Paris. He became a leading obstetrician and teacher. During his twenty years in London 900 students attended his lectures and together with these students he attended 1,150 cases of labour.

Smellie's methods and teaching pervaded not only the British Isles, but also extended to middle Europe.

Coincident with these events, the increasing benevolence of the age found scope for its generosity in combating the appalling infant mortality among the poor, and, in particular, amongst deserted illegitimate children.

It is from 1739 onwards that one is conscious of a change which, commencing with the teachers, involved the charitable public, still later the public health authorities, and, in recent years, the general public.

Smellie's example in teaching the art of obstetrics was followed by other teachers in great centres throughout the British Isles, and, resulting from his work, the necessity for the provision of accommodation for the parturient mother was recognised. As Trevelyan expresses it: "The great improvement in professional skill was supported by the foundation of hospitals, in which the age of Philanthropy gave sober expression to its feelings, just as the age of Faith had sung its soul in the stones of cloisters and cathedral aisles."

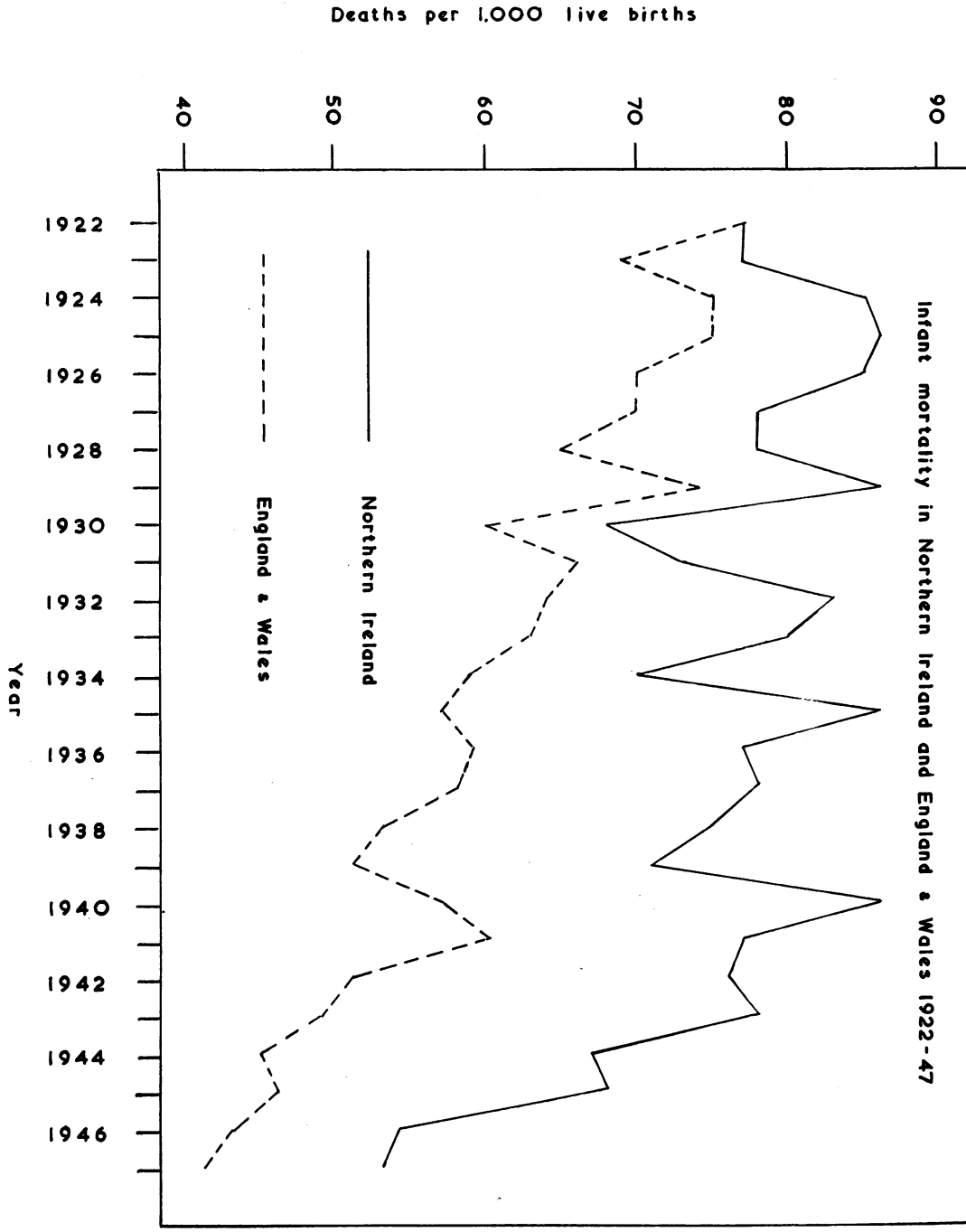
From the middle of the eighteenth century onwards we observe the gradual development of the maternity hospital, to the stage where it is presently an essential part of any maternity service.

The first maternity hospital was founded in a small house in Jermyn Street, London, in 1739, and was the forerunner of Queen Charlotte's Hospital. The Rotunda Hospital, Dublin, founded in 1745, was the second maternity hospital to be established. This hospital at the head of O'Connell Street immortalizes the name of Bartholomew Mosse, who was its first master. Mosse's work in Ireland was as important as that of Smellie in England, but he went a stage further when he founded the Rotunda Hospital. Like Smellie, he too was subjected to severe and almost libellous criticism. The physical and mental strain associated with this project brought about his death at the early age of 47 years. Although he had been such a benefactor to the hospital and city, the minutes of the Board of Governors contain no reference to his great work, or even a resolution of condolence with his widow.

The establishment of maternity hospitals stimulated interest in and research into the care of the parturient woman, and drew attention to the necessity for improvement in the practice of midwifery.

Teachers of obstetrics for the last two hundred years have realized the great deficiencies in obstetric practice and have achieved the present position in the face of bitter opposition from many sources, including, in fact, the medical profession itself.

The first stage in progress would have appeared to be to teach medical students


Deaths per 1,000 live births
40
50
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1922
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1940
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1944
1946
Year
England & Wales
Northern Ireland
Infant mortality in Northern Ireland and England & Wales 1922-47

and in this way gradually improve the practice of doctors. Smellie, in spite of opposition, had done this in the homes of the patients. With the development of the maternity hospital, this seemed to be the obvious centre in which supervised instruction should be carried out, but such a suggestion raised bitter opposition from the general public. When the admission of medical students to the Rotunda was suggested, a pamphlet opposing the suggestion was published and circulated to the well-to-do women of Dublin. In this pamphlet it was said, "That the patients in the hospital were to be subjected to all sorts of indignities in order to afford instruction to a parcel of brats of boys, the apprentices of surgeons and apothecaries."

Similar opposition was experienced in our own city up to 1855. For example, when medical students were admitted to the Maternity Hospital in Clifton Street the Charitable Society, the ground landlords of the Hospital, demanded a rent from the Committee of Management on the grounds that, having converted the Hospital into a training school for students, they were using the Hospital for a purpose for which it was not intended.

At the same time, Bishop Knox, the then Lord Bishop of Down, along with many others, discontinued his annual subscription to the Hospital. The Committee of Management retaliated by charging Professor Burden, the other members of the medical staff, and medical students a fee for the privilege of attending the Hospital, stating that, as the Hospital had been founded for the relief of poor women, "it cannot be considered as a proper disposal of the funds to expend them for the accommodation of medical students who cannot in any way be regarded as objects of charity."

With the passing of time, the training of the medical student has become a recognized feature of the work of the maternity hospital and has been amply justified. It is the only possible way in which the future doctor can be trained, and as Osler has said, no hospital could fulfil its mission that was not a centre for the instruction of students or doctors.

The admission of medical students to maternity hospitals was undoubtedly a long overdue reform, but many of the advantages of this departure were nullified by reason of the fact that midwifery was not a compulsory subject for the qualifying examination. This was not peculiar to the British Isles, but was a world-wide feature of medical curricula, and thus the difficult position of obstetric teachers persisted.

In 1855 Semnelweiss was waging war against puerperal sepsis in Vienna, but his valiant efforts were opposed by his colleagues and almost brought to nought because students were not obliged to pay any attention to midwifery to qualify as doctors.

At the same time in America Oliver Wendell Holmes, who, unknown to Semnelweiss, had advanced the same theories, was endeavouring to overcome the resistance and enlighten the minds of his contemporaries.

In the British Isles conditions were somewhat better, but in Ireland alone do we find evidence of any real advance.

In 1833 attendance at clinical lectures was made compulsory in Trinity College, Dublin, but it was not until 1867, eighty-two years ago, that a certificate of practical midwifery and attendance on six cases was demanded.

The establishment of the Queen's University of Ireland in 1849, with its three constituent colleges, marks the first attempt at obtaining a uniform standard of teaching with central authority to enforce it, and in 1852 an ordinance of the University laid down a standard of training which is higher than that demanded by the General Medical Council to-day.

The establishment of the General Medical Council in 1858 marks the beginning of a new era in medical education, but unfortunately the Council did not appear to be interested in the teaching of obstetrics.

From 1859-1896 the teachers of obstetrics were unrelenting in their efforts to raise the standard of learning in this great subject, but their recommendations received scant support from the authorities. It was not until 1886, sixty-three years ago, that proficiency in midwifery was an essential requisite for qualification as a medical practitioner in these islands. In 1896 the Council made recommendations which were accepted by some licensing bodies, but the Irish Medical Schools expressed their regret that these were far below the standard demanded by the Irish colleges.

It was not until 1906, forty-three years ago, that the rules and regulations in force to-day were accepted by the General Medical Council. It is both painful and shameful to have to record that the main opposition to improvement in teaching came from the medical profession itself.

To the snobbery and prudery of the Victorian era, as exemplified in the attitude of some physicians and the lay Press of that period, we must attribute the delays and defeats in the struggle for improvement and advance in obstetric teaching.

When the English Obstetrical Society was formed in 1825 Sir Henry Halford, President of the Royal College of Physicians, wrote to Sir Robert Peel, saying that no man with an academic education ought to practise obstetrics. During the long struggle in the General Medical Council one eminent medical man decried the necessity for any improvement in the teaching of obstetrics on the grounds that already more time was devoted to the teaching of obstetrics than to that of ophthalmology, while he said all humanity have two eyes, whereas only half of it has one uterus. At the same time, a Press campaign was inaugurated, and one paper actually published an article "on the impropriety of man being employed in the business of midwifery." It spoke of the practice as "most odious, unnecessary, and cruel, and productive of infinite mischief; cruel to the modest wife and the sensitive husband."

While all this may seem unreasonable to-day, one must view the circumstances from another aspect.

From the beginning of time the greatest danger accompanying childbirth has been infection. Now the establishment of maternity hospitals resulted in many expectant women being brought together in one place. This resulted in increased

risk of infection and undoubtedly the death rate from puerperal fever, not only in hospitals, but also in domiciliary practice, was a public scandal, and, moreover, one must remember that it was not until 1875 that Pasteur demonstrated the cause of infection, and Lister adopted methods for its defeat.

In spite of this, in the fifty-seven years (1847-1903) for which statistics for England and Wales are available, there were registered no fewer than 93,243 mothers as having died from puerperal fever. This appalling death rate naturally caused public anxiety and possibly explains much of the opposition to which I have referred, because, as far as one could see, the participation of men in the practice of midwifery had not resulted in any appreciable improvement.

When it is realized that in the twenty-five years from 1911-1935 seventy-five thousand women died in England and Wales from causes associated with pregnancy and childbirth, and that approximately twenty-five thousand of these died from puerperal sepsis, it will be appreciated that there was cause for anxiety even as recently as fourteen years ago.

The obstetrician is concerned not only with the life and well-being of the mother, but also with that of the child. The death rate of newborn infants and those in the first year of life in 1899 was 163 per thousand. This was not only generally deplorable, but highly discreditable to the profession. Many conditions, however, apart from medical practice, must share in the blame for this state of affairs.

To-day, with the improvement in obstetric practice and the provision of skilled nursing and pædiatric care, the mortality among the newborn and infants in the first year of life is between forty to fifty per thousand live births, but much of this mortality is unavoidable.

It is difficult to assign a definite beginning to any movement for social improvement. In most instances a few individuals of exceptional public spirit are responsible for initiating reforms which later become generally applicable.

I have mentioned the efforts of individual teachers in obstetrics, but the credit for the development of the maternity and child welfare movement must be given to Dr. J. W. Ballantyne of Edinburgh. Up to the first decade of this century little or no attention had been paid to the expectant mother. She was rarely examined in the antenatal period, with the result that avoidable complications were unrecognized until a catastrophe occurred or the patient was seen during labour.

In 1901 Ballantyne published a plea for the "Pre-Maternity Hospital." This article impressed one reader to such a degree that he gave £1,000 to the Edinburgh Royal Infirmary to endow one bed for pre-maternity cases. For the next fourteen years Ballantyne worked to convince the authorities and the profession of the value of this type of work, and in 1915 an antenatal centre was established in Edinburgh. Ballantyne believed that a great deal could be done to safeguard the health of mother and child by the provision of pre-maternity hospitals and rest homes; by supervision exercised through clinics at which mothercraft could be taught, and by adequate provision for the treatment of syphilis and the protection of the premature infant. He opposed the notification of pregnancy, but he thought "that a

small sum of money might usefully be offered to women giving early notice of approaching confinement." This principal of bribery has been employed in a more subtle fashion in recent times. Ballantyne's principles and teaching have been accepted throughout the world, and as this work has developed we are beginning to reap the benefit of his foresight.

No survey of the evolution of obstetrics would be complete without referring to the position of the midwife. The midwife is to-day an essential part of the service, and the improvement of her status and training is one of the most important advances.

I quote here from McCleary, who has stated that "midwifery was long the Cinderella of medicine. It is strange that this should have been so. The successful bringing into the world of a new human being, without danger or damage to mother and child, overcoming the manifold difficulties that may attend pregnancy, labour, and the puerperium might well have seemed a service calling for all the skill that medical science and art can command. Yet it is a service that for many centuries was left entirely in the hands of untrained ignorant women; and long after medical men had begun to attend women in childbirth it was regarded as an inferior kind of professional work."

In the early days of the participation of men in the practice of midwifery the midwives opposed the change bitterly, and one famous London midwife, Mrs. Nihell, in a pamphlet attacking William Smellie, to whose pioneer work I have already referred, described him as "a great horse godmother of a he-midwife."

Advances in obstetric practice meant that collaboration between the doctor and the midwife was essential.

The first advance which influenced this change was the invention and development of the obstetric forceps, which for many years was retained as a family secret by the Chamberlens.

In 1855 the discovery of the cause and the description of the ravages of puerperal sepsis by Semnelweiss in Vienna showed that the practice of midwifery was in unskilled hands.

The discovery and use of chloroform in midwifery by Sir James Y. Simpson in 1847 meant that the association of the doctor and midwife was absolutely necessary.

Like all great advances, these were opposed, and one theologian denounced chloroform as a "Decoy of Satan, apparently offering itself to bless women; but in the end it will harden society and rob God of the deep and earnest cries which arise in time of trouble for help." Simpson's reply to the theologians was to refer them to the account of the first surgical operation ever performed on man which is contained in Genesis 2: 21—"And the Lord God caused a deep sleep to fall upon Adam, and he slept: and He took one of his ribs, and closed up the flesh instead thereof."

In this city, about 1855, Professor Burden had evidently tried to train midwives in response to frequent appeals from the practitioners in the city. From a letter in existence he appears to have been unsuccessful. He was not prepared to accept

defeat, so he admitted a Mrs. Hamill for training with the status of a medical student, charging her a student's fee and giving her private tuition, as "she had to be instructed alone."

The Ladies Committee of the Maternity Hospital objected to this for two reasons. First, they stated that "it was with considerable reluctance that the ladies revived the old custom of admitting nurses into the Hospital, as it had generally been productive of great annoyance." Secondly, they regarded the charging of a student's fee as a imposition and the private tuition as unnecessary. "When they know it is impossible a woman could require or would be capable of receiving so much instruction."

A long struggle, reminiscent of that experienced by the teachers of midwifery, and one in which the General Medical Council was in the opposition, ensued from 1866 to 1900, and finally, in 1902, the first Midwives Act was passed, prohibiting the practice of midwifery by unregistered midwives, to be followed in 1918 by a further Act controlling the training and registration of midwives.

War is one of the greatest catastrophies which can befall the human race, but the First and more particularly the Second World War have had momentous results. The falling birth rate and terrible loss of life between 1914-1918 strengthened the determination that money and effort should not be lacking for the care of mothers and young children. The notification of Births (Extension) Act, 1915, marked a step forward because it conferred upon county councils the statutory powers to make arrangements for the care of expectant and nursing mothers.

From this time forward there is evidence of the demand from all sections of the general public for skilled medical and nursing attention at their confinement. It has also marked the gradual disappearance of a misconception prevalent among the lay public, and some members of the medical profession, that every qualified practitioner is sufficiently trained to carry out single-handed any obstetrical operation.

This change is shown in the marked increase in the number of confinements occurring in institutions. For example, in Belfast in 1912 eight per cent. of the births were in institutions. In 1947 the figure had risen to fifty-two per cent., and this increase is representative of what has happened all over the British Isles. It was difficult to meet this demand not only because of the restricted accommodation, but also because of the lack of trained personnel.

In 1929 an important event occurred. In this year the College of Obstetricians and Gynæcologists, now the Royal College, was founded. The foundation of this College was due to the united efforts of all the principal teachers of the subject and stimulated by the enthusiasm of the late Professor Blair Bell of Liverpool and Professor Sir William Fletcher Shaw of Manchester. My predecessor, Professor Lowry, was one of the original signatories of the Charter, a Vice-President of the College, and one of the members of the first Council.

This College has now establised itself in many spheres, but its most important action was to lay down rules for the training of obstetric specialists, and it has been

the first college to demand supervised practical clinical training for the intending specialist before sitting for the post-graduate qualification.

My story up to date has depicted a depressing scene, but it has been one of slow and steady progress in the face of strong opposition.

From the year 1936 the tempo increases. From that year, as the result of the work of Colebrook on puerperal sepsis, the advent of the sulphonamide drugs and penicillin, of new and efficient antiseptics, and the slow reward of years of training, the scene begins to change.

The Second World War found the authorities with a more realistic outlook regarding the needs and the importance of the expectant mother.

I mentioned earlier that Ballantyne had been opposed to the notification of pregnancy, and probably any Government bringing a Bill before Parliament to make the notification of pregnancy compulsory would have been defeated. Bribery in another form than that suggested by Ballantyne has secured what was apparently impossible. The lure of extra rations and the necessity for making arrangements for the confinement as early as possible has torn the veil of secrecy to ribbons. The expectant mother now does not hesitate to notify not only her doctor, but also her butcher, grocer, and her milkman. This has been of great benefit to all concerned, as the patient is seen from the earliest days of her pregnancy and can be guided, supervised, and helped throughout. It has also given the general public quite a different outlook on a subject which at one time was not considered even decent to discuss.

Of recent years the causes of maternal and infant death which were common even fifteen to twenty years ago are now diminishing in frequency. The patient who causes anxiety nowadays is the one where some medical complication is associated with her pregnancy.

The above graphs, for which I am indebted to Dr. Cheeseman, Department of Social and Preventive Medicine, show the rapid improvement in both maternal and infant mortality in the past thirteen years. Nevertheless, obstetricians are still dissatisfied, as there is evidence to show that many maternal deaths occurring to-day are avoidable. It is important to remember, as has been pointed out by Dr. Elder, that the maternal mortality rate of four to six per one thousand live births reflects the degree of safety of domiciliary practice. The marked improvement in the death rate coincides with improved institutional facilities, improved training, and more skilled personnel.

It is regrettable that recent legislation is tending to force the general practitioner to deal with his maternity patients in less desirable surroundings than were available before the passing of the Health Services Act. This set of circumstances is already interfering with the training of the future doctor and midwife, and lowering the standard of antenatal care.

The improvement which has been noted has been secured largely by voluntary effort with assistance from the State, but without State interference. We are now embarking on a great new experiment where the State has taken control, though it is questionable whether the State fully appreciated the monetary value of all the

voluntary work done in the past. This is an experiment which, if it is to be successful, will have to combine all that is good in the old system with the advantages and good points of the new. It is an experiment in which I personally believe the Cinderella of Medicine will become the most attractive branch of medicine.

One of the great dangers of State medicine is that it may become impersonal. There is, however, a bond between the doctor who practises midwifery and his patient which it will take many years of State medicine to sever. This bond is one which is evident in every social class, and the gratitude and loyalty of one's obstetric patients is something which makes well worth while the arduous and exacting character of the work.

Midwifery has another great advantage over the other branches of medicine, namely, that it is in the forefront of preventive medicine. The great majority of obstetric patients are normal healthy women, and, therefore, in attending them, one has a positive objective in view—to deliver a healthy baby and leave the patient as fit and well when the confinement is over as she was before.

Wilfred Trotter said that medicine was in the very small class of professions that can still be called jobs for men. By that he meant "professions in which it is possible for people—men or women—to pursue the dying ideal that an occupation for adults should allow for intellectual freedom, should give character as much chance as cleverness, and should be subject to the tonic of difficulty and the spice of danger." No one can deny that obstetrics is subject to the tonic of difficulty and the spice of danger.

Of recent years great political capital has been made of the improved maternal and infant mortality. If credit is to be given for this improvement which I have mentioned and illustrated it should be to those whose work brought about improved control of sepsis, to those who introduced the sulphonamide drugs and penicillin, and, in no lesser degree, to those innumerable midwives, medical practitioners, obstetric specialists, and teachers who, each in his sphere, has contributed to the welcome and steady improvement which has taken place over the last decade.

As St. John Irvine recently said: "A finer race will be raised by those who desire it, but it will not be created by those who have subjected themselves to slavers, whether the slavers be private persons or Government departments. The beginning of all improvement is made by individuals."

REVIEW

AIDS TO TRAY AND TROLLEY SETTING. By Marjorie Haughton, M.B.E., S.R.N., S.C.M., D.N. Pp. 20 f. 136 illustrations. Baillière, Tindall & Cox. 5s.

This useful text-book is now in its fourth edition and some minor alterations have been made to bring the text right up to date.

The photographic illustrations are excellent, and the simple, concise instructions facing the illustrations should enable the student to learn quickly the setting and procedure required in the various trays and trolleys. Ample space is left for the student to make any additional notes. The glossary of instruments at the end gives large-scale illustration of some of the instruments which may not be seen clearly enough in the photographs. There can be no doubt of the continued popularity of this book with the student nurse.

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The Health Centre and General Practice

By FREDERICK HALLIDAY, M.B.

Presidential Address, British Medical Association, Northern Ireland Branch, Session 1949-50

MR. CHAIRMAN, LADIES, AND GENTLEMEN—I would like to thank you for the very great honour you have done me by electing me as President of the Northern Ireland Branch of the British Medical Association. I realise only too fully now how difficult it will be to follow Dr. Johnston in this position.

I was secretary of the branch for a period of five years and have seen a succession of presidents come and go. I can think of no president during my term of office as secretary who was called on to face such a difficult task as Dr. Johnston, or one who was by nature, experience, and training so well equipped to meet and overcome it.

His wide, humane, and broad outlook, combined with ready wit, often in the past year smoothed over many difficult situations and reconciled many points of view.

The following lines might almost be a description of him at a meeting of the council or the branch :—

> "Good temper triumphed in his face,
> And in his heart he found a place
> For all the erring human race
> And every wretched fellow."

His was a year in which the full impact of Socialist planning was felt on the practice of medicine, and in which many of the best traditions of our profession were being undermined, chief of which, to my mind, being that a doctor's responsibility was to his patient and to no one else.

In accepting this honour, therefore, I am conscious of my own shortcomings and beg your forbearance and patience with them. I am sure that it is a comfort both to myself and you to know that Dr. Johnston will be still available for help and guidance in the year to come.

I have chosen as the subject of my address "The Health Centre and General Practice," as it is one subject in which I think general practitioners are beginning to take more than a passing interest, which will grow as time goes on. After selecting this as a subject, I became aware of the fact that the pioneer work in this direction has been done by the public health services in this country.

In the past the general practitioner has been more concerned with the ætiology and treatment of disease as it affects the individual and has been inclined to leave the preventive side of medicine to the public health services. It is to be hoped that the health centre of the future, by once again bringing the general practitioner

into close contact with the Public Health Officer and his auxillary services, will bring mutual benefits to both doctors and patients and fill many gaps in the general practitioner's knowledge, and, we venture to hope, some gaps in that of the Public Health Officer.

It is important, I think, to distinguish between the health centre itself and the different services that are or may be provided from it.

In this country the services appeared first, and, as they grew in importance and extent, so the need for the health centres also appeared and grew. Often both the services, and the buildings wherein the services were provided, were called "clinics."

In Britain we are rightly given credit for the introduction of mothers' schools and anti-tuberculosis dispensaries, but some claim that the United States of America first gave birth to the term "health centre." In that country the growth of health centres came about as the result of decentralisation of the activities of public health departments in large cities.

In a recent article Parry quotes Dr. John Rice, former Health Commissioner of New York, as saying : "A comprehensive service for the people can sometimes be made more effective by decentralising some of its functions. This has become increasingly evident in the field of public health administration in a great city." He goes on to quote another leading American health authority (Dr. Huntington Williams) of Baltimore, as saying : "Whether the problem is the administration of a State Health Service department, or that of a big or small city, the viewpoint of our time calls for decentralisation. Public health services, both preventive and curative, must be brought to the several neighbourhoods in order to make possible a speedy, efficient, service for the people." As Parry remarks : "This is indeed strange language to us in this country, who have heard so much in recent months about the value of centralisation to gain efficiency."

On the other hand, in Great Britain the clinics and dispensaries were first developed as a result of the effort of voluntary workers in the field of public health. These workers started a social medical service in their neighbourhood to meet a special need. Amongst the first of them to be established was the Tuberculosis Dispensary, founded in Edinburgh in 1887 by Sir Robert Phillips.

The next to appear, towards the end of the nineteenth century, was mothers' schools and infant milk depots, which were first started in New York and Paris. In 1899 the first one was opened in Great Britain, in St. Helen's, and subsequently three more appeared in Liverpool, Birmingham, and Shoreditch, financed by grants from the Carnegie Trustees. By 1946 there were 4,000 child welfare clinics in Great Britain, 3,141 being organised by local authorities and 59 by voluntary agencies.

At the same time as these services were being established in Great Britain, there was also being established a system of free and provident dispensaries in many large urban areas for the purpose of providing medical services for the suffering poor. These were first established as a special branch of the charity organisations

then in existence, and at a special conference in December, 1871, of the Charity Organisation Society it was decided to set to work in two directions : (1) to enquire into cases for hospitals (welfare and home visiting); and (2) to promote provident dispensaries; the latter, for a few pence weekly, secured to a family the right to medical treatment for all its members, with a choice of doctors and attendance at home when necessary. Some of these dispensaries are still operating in London and in the provinces, and until quite lately under State management in Northern Ireland under the 1898 Local Government Act.

One must mention briefly the influence of the "settlement" (e.g., Toynbee Hall); the district nurse movement and the nursery school, first established by Robert Owen in 1816 in New Lanark in Scotland, and developed many years later into the modern nursery school by Margaret McMillan and her fellow pioneers.

The growth of these voluntary organisations to provide neighbourhood services both here and in the United States of America, and the idea of the decentralisation of public health administration gradually led in the United States to the concept of a health centre which would co-ordinate all these services. Wilinsky of Boston was, perhaps, the first worker in this field to define the objects of a health centre as "the physical headquarters for co-ordinated community health and welfare services. The health unit has taken its place beside the Church, the school, the settlement, the meeting house, and other essential community structures. One is mindful of the many factors that play so important a part in the improvement of health conditions. The trained worker realises the value of the significant contributions made, and the parts played, both by the official and voluntary health agencies. The creation of a common meeting ground, functioning as a clearing house for health and welfare endeavour, has resulted in the removal of an unnecessary amount of duplication, friction, and delay." The first health unit in Boston was opened in 1916, and by the year 1936 there were eleven district health centres which housed neighbourhood health services.

In Great Britain the development of health centres has been much slower than in the United States. In this country clinics of various kinds have been developed, which worked side by side in the same field as the poor-law dispensaries, tuberculosis dispensaries, and the ante-natal clinics mentioned above. These clinics were for the treatment of special diseases or special groups of people, e.g., eye clinics, orthopædic clinics, and venereal diseases clinics. There was little, if any, attempt to co-ordinate the work of these clinics with the other neighbourhood services. One found the midwife, the health visitor, the district nurse, the sanitary inspector, the hospital almoner, the psychiatric social worker all working in the same field with hardly any attempt at collaboration. There was a tendency for the local health authority to employ more and more the full-time medical officer for these services and he was not authorised to give a domiciliary service or encroach on the field of private practice, *and the family doctor remained isolated from the clinic services.*

The general practitioner had been waging a losing battle against the intrusion

of the State into the field of domiciliary practice, and little attempt had been made to enlist his aid or to enlarge his view of his communal responsibilities. The public health worker was, therefore, left with many gaps in his knowledge of the home conditions of the population.

Although this problem had been recognised and discussed for some time in this country, it was not until 1919, after the First World War, that definite action was taken. In that year, under the Ministry of Health Act, a consultative Council on Medical and Allied Services was appointed, which is usually referred to as the Dawson Committee. The council submitted its first interim report in 1920. The subject of the report was "to consider and make recommendations as to the scheme or schemes requisite for the systematised provision of such forms of medical and allied services as should, in the opinion of the council, be available for the inhabitants of a given area."

This report contains one of the earliest references to health centres in British literature.

"We begin with the home and the services, preventive and curative, which revolve round it, viz., those of the doctor, dentist, pharmacist, nurse, midwife, and health visitor. These we style the domiciliary services, and they constitute the periphery of the scheme, the remainder of which is mainly institutional in character.

"A health centre is an institution wherein are brought together various medical services, preventive, and curative, so as to form one organisation.

"Health centres may be either primary or secondary, the former denoting a more simple, and the latter a more specialised service.

"The domiciliary service of a given district would be based on a primary health centre—an institution equipped for services of curative and preventive medicine—to be conducted by the general practitioners of that district, in conjunction with an efficient nursing service and with the aid of visiting consultants and specialists. Primary health centres would vary in their size and complexity according to local needs, and as to their situation in town or country, but they would for the most part be staffed by the general practitioners of their own district, the patients retaining the services of their own doctors.

"A group of primary health centres should in turn be based on a secondary health centre. Here cases of difficulty or cases requiring special treatment, would be referred from the primary health centres, whether the latter were situated in the town itself or the country around. The equipment of the secondary centres would be more extensive, and the medical personnel more specialised. Patients entering a secondary health centre would pass from the hands of their own doctors under the care of the medical staff of that centre. Whereas a primary health centre would be mainly staffed by general practitioners, a secondary health centre would be mainly staffed by consultants and specialists. It would be a consultant service in function and would be carried out by specialists or by general practitioners acting in a consulting capacity.

"Secondary health centres must of necessity be situated in towns, where alone an efficient consultant service and adequate equipment could be expected and the necessary means of communication exist."

The report then goes on to outline such a scheme for the County of Gloucestershire and illustrates it with diagrams and states that:

"Underlying our recommendations is the dominant purpose of providing the best services for the health of the people. Our recommendations are designed to secure :—

1. Provision of buildings and equipment.
2. Services suitably correlated and available for all.
3. Opportunity for the best work and the furtherance of knowledge.
4. Co-ordination of preventive and curative medicine.
5. Freedom of action for doctor and patient."

The objects aimed at in these recommendations still constitute the basis of any satisfactory scheme and it was unfortunate that the implementation of the report was delayed for so many years, mainly for economic reasons.

It was not until the introduction of the National Health Service Act in 1946 that further progress became possible and a committee of the council of the British Medical Association was formed in April, 1947, "To investigate and report on existing forms of group practice, including partnerships and other forms of collaboration between general practitioners, and to relate this and other experience to health centre development."

The interim report of this committee was published in July, 1948, and drew attention to the defects of present-day practice and made some recommendations in regard to health centres. It referred to *defects that must be remedied in the present system* :

I The most serious defect is the arbitrary division of family medical practice into several compartments, represented by the various clinics and so-called general practice. This started with an attempt to separate preventive from therapeutic work, which is impossible, and has ended in an attempt to separate ambulatory from domiciliary work, which is indefensible.

II Many doctors work too much in isolation : the more solitary a general practitioner is, the harder it is for him to play his part under modern conditions. Medical officers of clinics, on the other hand, are handicapped by confinement to a too narrow field of work, and lack of contact with patients' homes.

III Some doctors' surgeries are ill-situated for their purpose, few have ideal labour-saving premises, or as much secretarial, dispensing, and nursing help as they could profitably use.

IV The care of patients in bed at home is often difficult through lack of room and the shortage of domestic and nursing help. This leads to many patients being admitted to hospitals on the ground of domestic difficulty, and not because they need the attention of a speciaist or the full facilities of a

hospital. They thus occupy beds which ought to be available for cases requiring specialist investigations and treatment.

V Even under perfect conditions the family doctor would have no easy life, but, as things are to-day, many are needlessly burdened by conditions that could be altered with advantages to the public as well as themselves. Examples are the surgery combined with the home, shortage of domestic and secretarial help, and lack of planned free time.

VI All the above factors lead in one way or another to waste of professional time, for which the nation could ill afford to pay, even if there were not a shortage of doctors."

It then draws attention to features of the present system that must be retained or developed :—

1. "The personal doctor/patient relationship, characteristic of existing general practice, takes first place. Derived from this are the conception of the family as the clinical unit and the position of the general practitioner as the co-ordinating figure from whom the whole of the health services radiate.
2. The intellectual stimulus of working in frequent contact and consultation with colleagues is a valuable factor in maintaining a high standard of medical practice.
3. Experience has shown that many of the chief benefits of partnership depend on the partners having a common place of work.
4. The variability and flexibility of practice to suit different conditions, the purely voluntary nature of partnerships, and the freedom of doctors to organise their work as they think best are features suited to the National character and largely responsible for the high standard of medical work in Great Britain and should be preserved.

Consideration of these aims leads to a definite conception. It is that of a well-equipped building housing a group of doctors who carry out in a co-ordinated way all the work at present done by general practitioners and clinic medical officers. The remainder of the section pictures these doctors as having an organised association with the work of the local hospital. The working place of such a group of doctors may be called the "Health Centre." This term has already been applied to buildings of various types with varying functions, but the council is of the opinion that, although the organisation of each centre should be flexible and adapted to local conditions, it should in general conform to certain basic principles and the development of a system of health centres should proceed on certain lines of policy agreed by the medical profession."

It makes certain recommendations in regard to the services to be provided. It does not consider that any improvement on present conditions would be gained by the provision of health centres housing general practitioner services alone, or local authority services alone. The centre should unite these two into a single well-co-ordinated service. As well as this, the centre should have its own staff of nurses and midwives, so that frequent consultation will co-ordinate the work of doctors

and nurses attending the same cases or visiting the same households. Every centre should take part in a programme of health education. Thus the minimum range of work recommended includes :—

(A) 1. General Medical Service.
2. Care of mothers and young children.
3. Care of schoolchildren.
4. Vaccination and immunisation.
5. Ante-natal and post-natal examinations.
6. Health visiting.
7. Home nursing.
8. Health education.

(B) Specialist Services.

(C) Dental Services.

(D) Pharmaceutical Services. In Northern Ireland this has been limited by the Act in its present condition.

(E) *Health Centres and Medical Education.*

After considering the possibilities of general practitioners teaching clinical students, either in the lecture room or in the field, this report comes to the conclusion that general practice should be regarded as a post-graduate subject. A recent letter by Professor J. A. Ryle even suggests that a year's post-graduate service in a health centre might eventually be a condition of admission to the Medical Register.

As regards the suggestion that has been put forward that a health centre should be established conveniently close to, or in, a teaching hospital, for purposes of medical education and research in social medicine, it remarks that "This might or might not be the best site for giving most convenient service to the patients of the centre; it would almost certainly not give the best conditions for the work. The impersonal atmosphere of a modern hospital must at all costs be avoided in a health centre. A health centre will not teach students the right lessons unless it is situated, designed, and run appropriately for its primary purpose, which is the provision of family medical service."

The council suggests that there should be wholetime apprenticeships at the health centres for students or new graduates, not more in number than the medical staff. The report then goes on to discuss the organisation of the professional staff and its work. It passes on to the administration and lay staff of the centre. In connection with the later it says : "The way in which the work of the lay staff is carried out is very important. The introduction of health centres will do more harm than good if they acquire an institutional atmosphere. At all costs the patient must continue to feel that he is making a private visit to the doctor who is a friend of his own choice. This will not be easy. In hospital out-patient departments it has been difficult to avoid impersonal handling of patients, and in the public health clinics too, the atmosphere has been anything but one of privacy."

Passing on to the question of health centre buildings it discusses :—

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(*a*) *The site.*—In this connection many patients will have further to go than before, for the simple reason that the doctors are gathered together in a group of six or more, whereas formerly they were scattered about in ones and twos. Town planning should provide for the sites of health centres, even when there is no possibility of building them at present.

(*b*) *The population to be served.*—The council has considered the figures suggested by various planning bodies. It estimates that in urban areas eight doctors should serve a population of twenty-five thousand at one health centre. This would cover a district with a radius of one mile.

(*c*) *The buildings should be designed for the purpose.*—Ideally, all health centres should be new buildings.

(*d*) *Accommodation required,* viz :—

(I) *The Administrative Unit* should consist of entrance hall with seats, reception, and record office, telephone switchboard, and office for the Administrator's secretary.

(II) *The Consulting Unit* should contain a suite for each general practitioner on the health centre staff. Each suite should contain a consulting room, an examining room, and a waiting room. As a minimum, there might be one waiting room for two doctors' patients; a large common hall is to be avoided. The decorating, furnishing, and equipping of each doctor's rooms should be carried out to his own taste.

(III) *A Minor Surgical Unit* may or may not be required, depending on the character of the areas served and the availability of a hospital out-patient theatre. When provided it should contain a theatre and sterilising room, a dressing room, and recovery room.

(IV) *The Dental Unit*: When provided this should consist of surgeries for the dentists, recovery room for the patients, and separate waiting rooms.

(V) *Ante-Natal Unit*: Including waiting room, consulting room, and series of examination cubicles.

(VI) *Child Welfare Unit*: Including waiting room, weighing room, toddlers' nursery, consulting room, small isolation room, and milk sales room.

(VII) *A Separate Schoolchildren's* Unit would have certain advantages.

(VIII) *A Dispensary may be required.*

(IX) *A Common Room* should be available to the medical staff for consultation and discussion. The provision of considerable amenities here, including facilities for the preparation of light refreshments, would, in the council's opinion, add to the practical efficiency of the centre's work.

(X) *A Large Room for Lectures* and demonstrations will be needed for the development of a health education programme if this is to be based on a health centre.

(XI) *Sleeping Accommodation* will be required at the centre if it is considered necessary for a doctor on night-call to stay there.

(XII) *Toilet Accommodation* for staff of each sex and similar accommodation for patients.

(XIII) *Accommodation for Caretakers*: In most cases it is convenient to employ a resident couple for this work.

(XIV) *Storage Space* for professional and clerical materials.

(XV) *Parking Space*: Sheltered, divided into separate parts for (1) perambulators; (2) cycles; and (3) cars.

The report of the Society of Medical Officers of Health on health centres (1947) touches on some aspects not mentioned in the above report. On the question of the population to be served by a health centre, it favours the figure of ten thousand within a radius of half a mile, this being the farthest distance that a mother might be expected to push a loaded pram.

On the subject of equipment it recommends that the provision of aids to diagnosis should be considered—"In fact, experiment must be in the direction of expanding facilities and not in the direction of limiting them."

On the question of X-ray facilities, this depended on whether the greatest support was given to the contention that the diagnostic and radiological service should be centralised in the hospital specialist department, or whether the accepted view was that there would be greater benefit and assistance to both doctor and patient in the availability of appropriate apparatus on the spot. Similar considerations arose with regard to a centralised laboratory service or a decentralised one, with a full-time technician linked to, and under the supervision of, the main laboratory for the purpose of undertaking all routine, biochemical, many hæmatological, and some bacteriological examinations. Again, should there be provision of small laboratory accommodation where the doctor could carry out his own investigations at the health centre?

The report makes some suggestions on a plan for health centres in rural areas. It refers to the cottage hospital as a possible health centre. "The cottage hospital is the natural place in which to concentrate all the various health activities of the district. It might become the health centre, the meeting place of all the various clinics, such as ante-natal, child welfare, orthopædic, and ear, nose, and throat. It is the natural place for such activities, and along these lines one can envisage continuous and careful progress. It must not be forgotten, though, that if they are to go along such lines, efficient records will have to be kept, and for that purpose trained clerical assistants will be needed."

In this very brief survey of the growth of the health centre and its future relationship to general practice, one can see a gradual change taking place in the practice of medicine as we have known it in the past fifty years. The increasing demands on the time of the general practitioner under the National Health Service Act, and the special investigations required to establish a diagnosis in the light of modern knowledge, call for a change in the conditions under which the general practitioner works, and a wider education in relation to his communal responsibilities.

In England some progress has been made in providing these facilities by building health centres like Woodberry Downs, Peckham, etc., but in Northern Ireland no health centre which fulfils the requirements described has appeared; namely, an institution, both for preventive and curative medicine, with a definite place in the life of the community; an institution where not alone medical, but dental, nursing, clerical, and social facilities are available, and where the psychological emphasis should be on health and not ill-health.

The Public Health Service in Ulster has done the pioneer work in this field of endeavour and with its help and guidance we should take our place in the march of progress, and an ever-widening outlook on our immense responsibilities to the community. Our profession has never been found lacking in that wider vision of the future envisaged by Tennyson in his lines:

"Yet I doubt not thro' the ages
One increasing purpose runs,
And the thoughts of men are widened
With the process of the suns."

I am indebted to Dr. James Boyd for his great help and assistance in making available to me the literature on this subject.

REVIEW

THE SELECTED WRITINGS OF WILLIAM CLOWES. By F. L. N. Poynter, B.A., F.C.A. Published by Harvey & Blythe Ltd. 15s.

EVERY now and then one comes across a book which has more than ordinary interest; such a volume is "The Selected Writings of William Clowes," edited by F. L. N. Poynter. It deals not only with the medical and surgical problems which Clowes was called upon to treat, but it gives an interesting side light on the life and times of the second half of the sixteenth century. There is a first-hand description of life in Elizabethan London, of service with the Royal Navy, of the wars in the Low Countries with the Earl of Leicester. In this campaign the British forces were centred in Arnhem and Nijmegan. In 1587 he returned to England and published "A Proved Practice," but before it appeared in print he was appointed Surgeon to the Fleet. It is thought that Clowes was on Howard's flagship the Ark Royal. After the defeat of the Armada he was released from service and was appointed "one of the Queen's Chirurgeons."

The remainder of this book consists of excerpts from Clowes' "Proved Practice." These give an interesting account of cases with which Clowes had dealt personally, and include, e.g., a record of a miraculous cure healed by Queen Elizabeth by "laying of blessed and happy hands upon," and of a man who had ulceration of "the Amigdales or kernels of the root of the tongue—and divers nodosities, knobs and knots on his shin bones." Clowes also comments on the baser side of life in London and the great number of "lewd Alehouses." He speaks "with very grief of heart" that in the hospital of St. Bartholomews in London there has been cured of this disease, by me and three others, within five years, to the number of one thousand and more." He reckons "that amongst every twenty diseased persons that were taken in, ten of them had the pox." A chapter is devoted to the various types of quacks, who "do in town and country, without order, honesty, or skill, daily abuse both Physic and Surgery. Their behaviour and code or morals throws his own into stronger relief, for time and again we read that he gives no promise to cure or miraculous result, even when to do so means the loss of the patient.

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Chronic Appendicitis in Children

By P. T. CRYMBLE, F.R.C.S.(ENG.), AND IAN FORSYTHE, M.B.

CHRONIC APPENDICITIS has been defined as the condition which is produced by one or more mild attacks of appendicitis occurring in a series which may include more severe attacks.

One must admit that it is exceedingly difficult to draw the dividing line between acute and chronic, but the cases referred to in this paper can be labelled chronic. The diagnosis was uncertain, the symptoms extended over weeks, months, or years, and, when seen by the surgeon, there was no indication for immediate operation. Most of the cases were referred to the surgeon after prolonged treatment in the medical out-patient department of the Belfast Hospital for Sick Children. The recognition of a chronic appendix is an important part of the work of a children's hospital, as removal of the appendix at this stage should have no mortality and may prevent serious trouble in later life, or save the life of an adult.

In many cases the symptoms and signs are so clear that the surgeon has no hesitation in advising operation, but in forty per cent. of a recent series of cases there were no signs on abdominal palpation and the only symptom was abdominal pain. This group might be called occult appendicitis, and special attention is drawn to it as there is a tendency for some surgeons to demand too much from signs before advising operation.

As an example of the condition, we report the following case :—

Florence P. attended a tuberculosis dispensary for five years and was treated for abdominal T.B. During this time she was sent to the Children's Hospital by a general practitioner with diagnosis of appendicitis, on two occasions, and admitted to the surgical ward, where the surgeon decided not to operate. Each time the patient was discharged after a few days.

Finally, after five years, she was, for the third time, diagnosed appendicitis, sent to hospital, where an operation was performed and definite appendicular pathology disclosed.

The appendix was retrocæcal, showed a kink at the junction of the distal and middle thirds and distal to the kink, the mucous membrane was dark red. There was a coprolith in the region of the kink. There was no sign of tubercular disease, and the symptoms disappeared after operation.

Insufficient attention has been paid to the colour changes shown by the appendicular mucous membrane in the various stages of inflammation, and it is our belief that any change from the normal lemon yellow is an indication of inflammation. Some of these colour changes are reproduced in this paper. These changes can only be recognised on opening the appendix and they may be the only evidence of pathology. Frequently they are distal to and sharply limited by a kink

or stricture. This paper begins with our conception of the anatomy and pathology of the appendix and with the signs and symptoms of chronic appendicitis. An analysis of a consecutive series of fifty children subjected to appendicectomy on the suspicion of chronic appendicitis in the years 1936-1948 follows.

Anatomy

There is marked variation in the normal anatomy of the appendix, and it varies in length, in position, in course, in relation to the peritoneal cavity, and in its attachments.

Length.—The average is 9.2 cm. The longest is 33 cm.

Position.—Attached to the postero-median quadrant of the cæcum and from this point may pass in any direction.

40 per cent. behind the terminal ileum; 30 per cent. retrocæcal or retrocolic; 25 per cent. Pelvic; 5 per cent other positions.

Course.—Straight, angular bend, hairpin bend, corkscrew, U-shaped.

Relations to Peritoneal Cavity

This is probably the most important factor in the anatomy of this region, since it has a bearing on the ætiology of appendicitis, on the pathological course, and on operative technique.

The appendix is always extraperitoneal, but, covered by visceral peritoneum, it may project more or less into the peritoneal cavity. The extremes in relationship are:—

(A) An appendix completely surrounded by peritoneal cavity, except along the attachment of its mesentery.

(B) A retrocolic appendix with no peritoneal cavity in relation to it. Between these two extremes all degrees of relationship are found.

Attachments

The appendix joins the postero-median quadrant of the cæcum and its fan-shaped mesentery ascends upwards and medially to the posterior abdominal wall. This mesentery passes behind the ileo-cæcal fold and is partially attached to it.

Such an arrangement, combined with complete encirclement by peritoneal cavity, permits free mobility to the appendix.

The following variations diminish the movements of the appendix and lead to obstructions of its lumen by angulation, hairpin bend, spiral, or corkscrew twist.

(*a*) The cæco-appendicular kink. Here the proximal half-inch of appendix is closely attached to the wall of the cæcum medial to the cæco-appendicular junction, with the result that an angular kink is produced at the junction of the fixed and mobile portions.

(*b*) Fixation to the back of the cæcum and ascending colon. This may involve the proximal portion or the whole of the appendix. Frequently the distal portion of the appendix is free, hangs downwards, and a hairpin bend is produced at the junction of the fixed and mobile portions.

(*c*) Fixation by a short section of mesoappendix. This leads to an angular kink of the lumen.

(*d*) Fixation by a peritoneal band to the brim of the pelvis.

(*e*) A cæco-appendicular fold passing upwards and laterally to the cæcum. It may lead to a spiral or corkscrew twist.

Surgical pathology, as observed at operatoin—before, during, and after removal of the appendix.

Inspection of the exposed organ may reveal : An angular kink, a U-shaped bend, a spiral twist, a stricture, due to changes in the wall, or blockage of the lumen by some material lying within.

Inspection of the mobilised organ before removal may demonstrate :

(*a*) Rigidity, due to œdema in the wall, or to the tension of fluid contained in the lumen.

(*b*) Dilated vessels may be seen coursing over the peritoneal surface.

(*c*) Œdema of the appendix, or its mesoappendix.

(*d*) Changes in colour—red, blue, or black.

(*e*) Fibrous tissue stricture.

(*f*) Cysts or cyst of the appendix.

(*g*) Diverticula.

After removal of the appendix the lumen should be opened, its contents noted, and the mucous membrane inspected.

An apendix may be normal externally and yet show marked pathology internally, so that one cannot diagnose the normal by palpation or external appearance alone.

Possible Contents

Normally the cæcal contents should pass freely into and out of the appendix, and opaque meal should enter the appendix sometime between seven and sixty hours.

It is quite normal to find some soft fæces in the lumen, but the presence of a hard mass or coprolith suggests stasis and justifies appendicectomy. This coprolith is a mixture of fæces, intestinal sand, and micro-organisms.

Swallowed materials, such as fruit stones, fruit seeds, metal or pottery fragments are occasionally present. Thread worms, blood, pus, or clear fluid may occur.

The presence of red blood is an indication of appendicitis and is nearly always accompanied by colour changes in the mucous membrane. Having removed all the contents and washed the mucous membrane, one inspects the mucous surface. Lemon yellow is the normal and *any change indicates inflammation.* There is often a well-defined threshold separating the normal from the abnormal, and this line usually corresponds to the site of obstruction. In other cases scattered areas of colour change are found.

The abnormal colours are heliotrope, red, purple, and black. The mucous membrane may show ulceration, perforation, or gangrene.

Analysis of the Fifty Cases

Sex.—28 females; 22 males.

Age.—Varied from 3 to 14 years.

31 of the cases were in the period 8 to 11.

The peak was reached in the eleventh year.

Symptoms.—There was intermittent abdominal pain in every case.

The situation was labelled: Abdominal in 27; R.I.F. in 10; Right side in 8; Umbilical in 5; Vomiting in 18 cases; Headache in 2 cases; Distension in 2 cases.

Previous admission to hospital for (?) appendicitis—2.

Previous history suggesting appendicitis—1.

Signs

Twenty-six cases had tenderness in the right iliac fossa and three of these had rigidity in the same region. Two cases had hypogastric tenderness, one case had umbilical tenderness, and one case had tenderness in both iliac fossæ. The remaining twenty cases showed neither tenderness nor rigidity.

The twenty which were free from signs included four of the five cases of thread worms and the three cases which showed a normal appendix.

Also in these twenty cases we find three cases in which the appendix was fixed to the back of the cæcum and colon.

X-Ray Examination

Seven and thirty-one-hour picture of the opaque meal were obtained in forty cases, with the following results:—

Definite deformity of the appendix	9
No filling of the appendix	21
Doubtful	4
Calcareous glands	3
Normal	3

Opaque meal examination is of value in cases which have attacks of abdominal pain with no tenderness in the right iliac fossa. Seven and thirty-one-hour pictures should be inspected. Definite deformity or no filling should favour operation.

Pathology

In only three cases was the appendix normal, and one of these was retrocæcal.

Kinks	17
Mucous membrane colour changes	28
Thread worms	5
Muco-pus in lumen	2
Pathological and retrocæcal	10
Calcified glands	1

More than one pathological condition may be present in a case. Thread worms were found in the appendix lumen in five cases, and in each of these cases there was other pathological evidence which appeared either as stricture, coprolith, or mucosal colour change.

FOLLOW-UP RESULTS

Untraced	4
Very good (free from all symptoms)	42
Improved, but symptoms still present	4

In these four cases, improved, but not cured, the appendix was found pathological at operation. The following details are given :—

NUMBER 28.—Girl, aged ten, with abdominal pain and vomiting for six months and tenderness in the right iliac fossa. The appendix was retrocæcal and the mucous membrane was bluish red at the tip, with red areas in the middle third. Since operation, two years ago, there has been no pain, but she has occasional vomiting.

NUMBER 34.—Girl, aged ten. Since the age of two has had intermittent attacks of pain in the right iliac fossa, with occasional vomiting. Tender in right iliac fossa. X-ray showed no filling of the appendix. At operation the appendix measured six inches and contained muco-pus in part of its lumen. Since the operation, three years ago, she complains of vague lower abdominal pains when constipated.

NUMBER 45.—Boy, aged ten. Right-sided abdominal pain, with occasional vomiting for one month. Health has been failing during this time. Tender in the right iliac fossa. X-ray showed no filling at seven or thirty-one hours.

The appendix was firmly bound to the back of the cæcum and ascending colon, and the mucosa of the middle third showed red and purple patches.

For one year following operation he suffered from left-sided abdominal pain, but is now completely free from any pain and can eat anything.

NUMBER 46.—A boy, aged six. Intermittent abdominal pain for six months. No tenderness or rigidity. X-ray showed no filling at seven or thirty-one hours.

At operation one found a kink at the middle third of the appendix, the lumen contained thread worms, and the mucosa was studded with petechiæ. Since the operation, in 1941, the frequency of pain attacks has diminished markedly. They used to be weekly and they are now three in the year.

It is interesting to note the following points in the follow-up.

(*a*) The four cases, which are not completely free from symptoms, all showed definite pathology. Muco-pus in one. Thread worms in one. Mucosal colour changes in two.

(*b*) Of the three cases which showed no pathology at operation, all have made a perfect recovery.

NUMBER 30.—Girl, aged 11. Was in hospital at the age of two with the suggested diagnosis of appendicitis. Came to hospital in 1946 with a history of crampy pains in the middle of the abdomen one year ago and attacks of pain in the right iliac fossa for the past month. Operation revealed an appendix normal in every way and no enlarged glands. Seen two years after operation, she reports freedom from all symptoms since leaving hospital and her appetite has improved.

NUMBER 32.—A girl, aged 12, in 1946 was seen in hospital with a three-month history of abdominal pain radiating to the right side and occasional vomiting. The appendix was not seen on X-ray after opaque meal. At operation the appendix was found to be normal in every way and contained some fæcal matter.

No symptoms since the operation.

NUMBER 12.—A boy, aged nine years, complained of abdominal pains for several months. X-ray examination reported calcified abdominal glands. Abdominal palpation was normal. At the operation of appendicectomy no pathology was discovered and there were no palpable glands.

Seen two years later he reported complete freedom from his abdominal pains.

CONCLUSIONS

The recognition of occult appendicitis in children is an important part of the work of a children's hospital and may save life or serious abdominal trouble in the adult.

A consecutive series of fifty cases have been investigated and followed up. Only four cases have failed to report.

The operation mortality was nil.

Twenty-six cases had tenderness in the right iliac fossa. Twenty cases were free from signs on abdominal palpation, and in this group were four of the five thread worm cases.

X-ray examination is of value in those cases which have symptoms, but no signs.

Attacks of umbilical or right-sided abdominal pain in a child, with tenderness in the right iliac fossa, justifies the diagnosis of appendicitis in the absence of any other signs or symptoms. Attention is drawn to the mucosal colour changes, which we believe are evidence of appendicitis.

REVIEW

THE PHYSIQUE OF YOUNG ADULT MALES. By W. J. Martin, D.Sc., Ph.D. Pp. 66. H.M. Stationery Office. 1s. 3d.

THIS memorandum, compiled by Dr. W. J. Martin and his associates and issued by the Medical Research Council through His Majesty's Stationery Office, price 1s. 3d. net, gives a very accurate and detailed review of Britain's young manhood in the year preceeding the Second World War.

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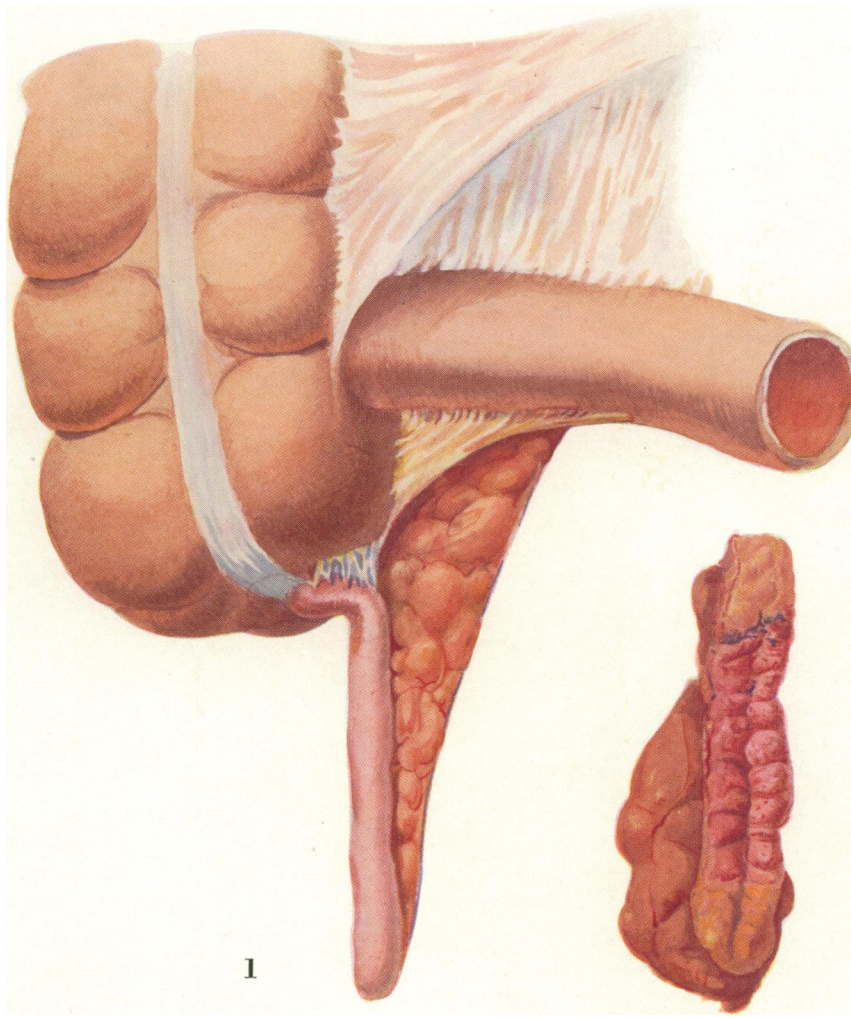
The records examined contained particulars of place of birth, nationality, age, trade, eyesight, weight, height, chest circumference, medical grade, physical defects, and medical history.

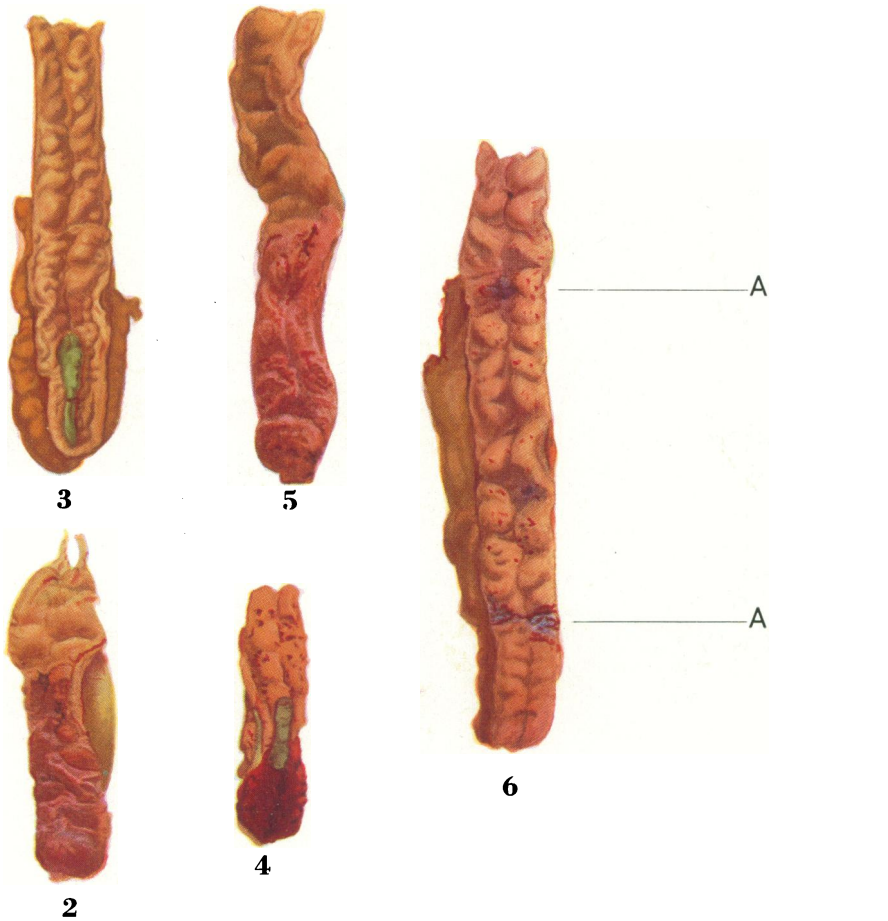
Dr. Martin presents a full analysis of the anthropometric measurements, medical grades, and standards of eyesight. The records confirm that "the degree of urbanisation is an important factor in the vital statistical experience of the Country; mortality progressively increases with increasing density of population."

Again, the data show that "the countryman is, on the average, superior in health and physique; he also has better eyesight than his counterpart in urban areas, and the latter is slightly all round better than the townsman."

The appendix is comprised of details of tabulated data covering thirty-four pages, and covers the fifteen main regions of Great Britain, with all the information required both by the statistician and those interested in anthropometry. G. G.



1.—Phenix. A case of chronic appendicitis due to a cæco-appendicular kink. Note the red colour of the mucous membrane of the middle two fourths and the normal lemon yellow colour of the tip and base. There is a heliotrope threshold at the proximal margin of the red area.



2.—Thornton. Chronic appendicitis in a boy. Twinges of pain in the right iliac fossa when walking. Faintness and attack of diarrhœa three weeks before operation. Lower abdominal pain which settled in the right iliac fossa. There was a stricture at the junction of the proximal and middle thirds and distal to this narrowing; the mucous membrane was red.

3.—Breen. Chronic appendicitis in a boy aged 12. Three-day attacks of abdominal pain, accompanied by vomiting for two months. Tenderness in the right iliac fossa. The tip showed thickening of the wall, contained two coproliths, and was separated by a stricture from the rest of the appendix.

4.—Florence P. This is the case referred to in the introduction. Treated for tubercular disease of the abdomen for five years, and admitted to hospital on three occasions as appendicitis. She complained of attacks of pain in the right side with vomiting. The appendix was retrocæcal, was kinked at the junction of the distal and middle thirds by a short band of mesoappendix, and the mucous membrane of the distal third was dark red. Note the coprolith at the junction of the normal lemon yellow and the dark red.

5.—Mrs. B. Chronic appendicitis in an adult. Pain in the right iliac fossa after food for five years. Tenderness over the cæcum. X-ray showed a fish hook appendix. The appendix was kinked at its mid point and the mucous membrane of the distal half is red.

6.—Subacute appendicitis in a girl of 11. Abdominal pain for three days and tenderness in the right iliac fossa. The lumen contained some blood, and the mucous membrane showed two blue areas (marked A).

No symptoms since the operation.

NUMBER 12.—A boy, aged nine years, complained of abdominal pains for several months. X-ray examination reported calcified abdominal glands. Abdominal palpation was normal. At the operation of appendicectomy no pathology was discovered and there were no palpable glands.

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Hare Lip and Cleft Palate

By G. D. F. McFADDEN, M.B., M.CH.(BELF.), F.R.C.S.(ENG.)

"A BEAUTIFUL FACE is a silent commendation," wrote Francis Bacon, and he might with equal truth have written, "an ugly face is a silent condemnation." A baby born with a hare lip must produce almost a feeling of revulsion in the mother and relatives. It takes a great mother-love to bring up with affection and care this almost hideous progeny. The condition occurs about one in every thousand births, so that there are probably thirty such infants born every year in Ulster.

On account of their appearance, these children are hidden from the public view. They are not wheeled out to the fresh air; they get little sunshine. This, coupled with the difficulties and laboriousness of feeding, causes many of them to fail in health. Some die; others are so feeble when first seen that there is no question of operation till their general health is improved. One child in this series only weighed 7½ lb. when three months old. It took another three months to make this infant fit for operation.

The hare lip may be complete or incomplete and be unilateral or bilateral (see Plates A). The defective lip may be continuous, with a complete cleft of the palate, or the palate may be normal or only partially cleft, or the lip may show a dent. Probably the most difficult lips to rectify are those where the palate is completely united. It is easiest to get a good result in a lip in which the nostrils are not affected. Hare lip in a man may be worse than in a woman, for the central area of the cleft is devoid of hair and the cleft is exaggerated. The growth of hair is associated with muscle fibre[1] (fig. V. C.).

V. C. *(After Veau)*
This patient has had a right unilateral hare lip. Note that the medial side of the cleft is sterile, being devoid of hair.

There are two embryological areas involved: an anterior part, associated with hare lip, and a posterior part, associated with cleft palate.

The defect giving rise to hare lip is the result of a lateral defect, just as a cleft palate is the result of a median defect. Note in the complete facial cleft (Plate A1) the palate is not affected. The defect must take place about the sixth to seventh week in intrauterine life. In the embryo there is no red margin to a lip until the muscle fibres grow into it. Where muscle is defective, the red margin will be defective.

Although there is a wide cleft, all the elements going to form the lip, or the palate, are present—as yet undeveloped and possibly misplaced. I think a law can be formed, stating that in cases of congenital dehiscence in any part of the body the elements are all present; although they may be turned aside or undeveloped—they are never absent. The surgeon in hare lip and cleft palate aims at bringing these embryological elements into their natural place, so that as growth occurs the normal will be produced. A plastic surgeon might use flaps from other areas to fill the gap, and for the moment produce an improved appearance, but, as growth takes place, the abnormal will become exaggerated and the lip "be a reproach to the surgeon and an ever recurring reminder to the patient of a surgical barbarity." As Veau states, we operate upon a face undergoing evolution—all the anatomical elements are indispensible to make sure of equilibrium in formation. If, unfortunately, one of these anatomical elements is misplaced, the equilibrium is broken and evolution adapts itself to this new state of dynamics, so that growth produces necessary new shapes which are essentially ugly, for the eye can only find beauty in the normal.

These embryological facts are the basis of modern treatment of hair lip and cleft palate. It was neglect of these that made the classical operations of Rose, Mirault, Jalaguier, Koenig, and so-called plastic operations such a failure (Plate D). Yet it seems strange that in one of the most recent books on plastic surgery I find only these operations recommended, and in one of the most popular of recent text-books of surgery and one on dental surgery only those operations that have been found wanting and are outmoded are illustrated.

In a complete unilateral hare lip with cleft palate the whole bony skeleton of the face is altered. The nasal septum is drawn to one side and the maxillary bones underlying are deformed (Plate E), so that no operation on the soft parts can wholly correct the asymmetry. Attempts at breaking the bone or repositioning the bones have only been met with disaster. The only way is to allow time, acting through the corrected soft parts, to mould the bones into a more normal shape.

When the hare lip is being repaired in a complete cleft associated with cleft palate, it is essential to close the anterior part of the palate and to form a good floor for the nostrils. For, if the hare lip is repaired without the floor of the nostril and anterior part of the palate being reformed, it will be impossible to get at these areas at a later date, leaving a resultant chronic fistula (Plate D). By repairing the floor of the nostril and the anterior part of the palate the closure of the rest of the palate is made more simple at the second operation.

Fig. E

Drawn from a skeleton of a case with unilateral complete cleft palate. It shows a marked distortion of the nasal septum.

(After Veau, with kind permission of Messrs. Masson et Cie)

In double hare lip, where the premaxilla is completely separate (Plate A3) and carried forward, it is unwise to do both sides at the same operation. For the bilateral stripping of the mucous membrane so depletes the blood supply that gangrene and sloughing of the central premaxilla may result. In these cases one side is first done, so converting a double hare lip to a single hare lip, and about two months later the other side is repaired.

Lately Denis Browne has described an operation in double hare lip in two stages that promises to be an improvement on the older methods (Plate T).

For the modern operations on hare lip we owe much to Veau,[1] and I make no excuse for quoting freely from his book.

There are four main points in the operation :—

1. The surroundings must be freely mobilised.
2. The natural elements must be brought into their natural site. Here muscle must be sought and brought across to meet muscle.

3. The red margins must be accurately opposed.
4. The columella must be respected.

Every good lip is thick and pliable—full of muscle. This muscle grows from the lateral margin of the cleft and is the guardian of the red mucous membrane. The internal flap is sterile (see fig. V. C.), being devoid of hair and muscle. The mucous membrane on the medial side can be sacrificed, but all mucous membrane from the lateral flap must be respected. If the operation is morphologically accurate, the result will improve with age. If not morphologically correct, the lip will get worse as the patient grows older (see Plates F and D).

I do not consider it wise to operate on a hare lip under six weeks of age. I prefer between eight and twelve weeks. Foggy weather should be avoided, and the more isolated the baby is from contacts the better. As to feeding whilst awaiting operation, a bottle with a bigger opening than normal in the teat—and flanged—may be used, or spoon feeding. As the latter method is slow and tiring to both baby and nurse, the baby should be fed every two to three hours. Breast milk is best. The babies should be well nourished, given as much sunshine and fresh air as possible, and any anæmia corrected, for anæmia is very common in these patients.

Operation

The only preliminary medication employed in infants is atropine. Gr. 1/300 is given half an hour before operation. In older children an appropriate dose of seconal ¾ gr. per stone is given along with 1/100 atropine.

Anæsthesia Employed.—Intracheal gas, oxygen, and ether. Care should be taken that the intratracheal tube does not become kinked. It is a small tube, and kinking is easy unless a special armoured tube is employed or one specially strengthened. These armoured tubes should be stitched to the back of the tongue as they tend to ride up, due to their spring, and so come out of the trachea during the operation.

Cleft Palate

Our eyes view a face, but it is only by our ears that a palate is judged. A palate may through operation appear to be anatomically normal, yet, if normal speech is not acquired, the operation is more or less a failure. For normal speech the palate must be capable of shutting off the nasal cavity from the mouth, and it must be soft and muscular, capable of fine vibrating movements, causing inflections of speech. An operation that produces this is a good operation. The operation should cause little distortion of the teeth.

In Normal Speech.—When about to speak the superior constrictor becomes tense and the soft palate is raised by the contraction of the levatores palati into a position in contact with the ridge of Passavant. "From this position it is capable of small and rapid movements, the sphincter alternately opening and closing at an extraordinarily high rate."[3]

It is seen that for normal speech the soft palate must be capable of closing off the nose and also capable of fine vibratory movements. It is in these two points the classical operations failed.

In 1817 Von Graefe described closure of the soft palate. He caused inflammation of the edges of the cleft and drew them together.

In 1828 Dieffenbach used lateral incisions to ease the tension on the sutural area.

In 1862 Von Langenbeck described his operation. This consisted of freshening the edges of the cleft, dissecting off the mucoperiosteum from the bony palate, and using lateral incisions to allow the flaps to meet in the middle line.

This operation naturally left a raw area on the nasal side and lowered the vault of the palate; the raw area on the nasal side was exposed to nasal bacteria, so that it frequently became infected, and breaking down of suture line occurred frequently, or, at best, a hard fibrosed palate (fig. G).

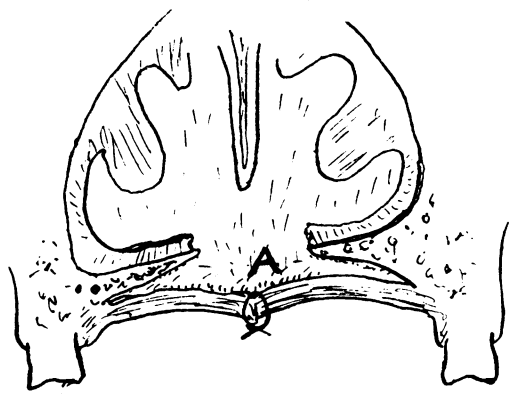


Fig. G
Note raw surface A on nasal side exposing the suture line to infection.

Flaps from the cheek or transposed from a distance, e.g., a finger, have been used to close the cleft, but, as Veau aptly suggests, these operations spring from the same motives as those of Omar, who burnt the Great Library in Alexandria, so that he might be the talk of the learned.[2]

Lane operated before the first dentition and took a flap from across the alveolar ridge, turned the flap like a hinge to lie across the gap. This allowed the baby to suck, but the interference with the alveolar ridge and the subsequent contraction of the scar tissue caused a marked distortion of the alveolar ridge and inequalities of the teeth (Plate H). Brophy, in America, sought to close the cleft by compressing the thin malleable bones of the baby and holding the maxillæ together by a wire suture passed through the maxillæ from one side to the other. This wire, although not interfering with the milk teeth, frequently passed through the permanent teeth buds.

It was following on the results of these operations that dentists drew attention to the severe handicap patients suffered from the irregularities and malocclusion of the teeth (Plate H). Prosthesis in these cases was very difficult, and, after long and tedious sittings, only very unsatisfactory results were obtained. Even speech was unsatisfactory, for the palate was hard and immobile from fibrosis. Fry and

others reasoned that better results would be obtained by dental fitting of plates and velum on patients without any operation on the palate, for the molar teeth would develop normally, and the resulting speech would be equally good. As the child grew, naturally these palate appliances had to be changed. If it had not been for the work of Veau, who developed a new technique and principle of operation, probably we should be still indebted to the dentists for the complete treatment of the cleft palate.

Apart from the distortion of the premolar and molar teeth following on scarring operations, irregularities of the teeth are to be found as an associated defect in all cases of cleft palate where the premaxilla is involved. This defect is usually limited to the lateral incisors, but often the canine is involved. The cleft passes through the region of the lateral incisor, and the latter may lie with the central incisor or be displaced laterally with the canine tooth; a supernumerary lateral incisor may be present. As the premaxilla normally carries the lateral incisor, it seems at first thought strange that in a cleft passing between the premaxilla and the maxilla the lateral incisor should bear such an inconstant position in cleft palate. This must be explained embryologically.

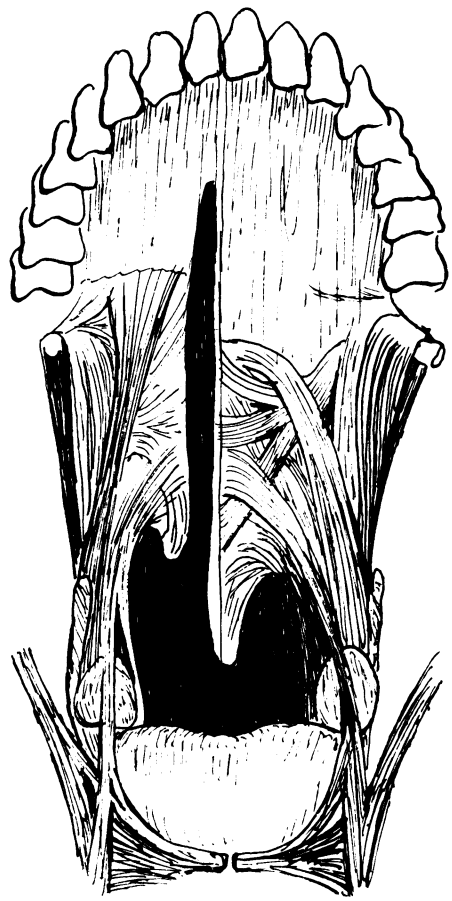
"The union of the globular and maxillary processes occurs between the fifth and sixth week. The primitive dental lamina is formed as a continuous semi-circular ingrowth within the lateral margin of the mandibular arch at the seventh week."[4] The tooth bud is not defined until the seventh week and is invaginated by the mesodermal papillæ from the enamel organ in embryos of the ninth and tenth week. Some think it is the dropping down of the enamel epithelium that prevents the union of premaxilla and maxilla. A missing or poor lateral incisor is supposed to show a hereditary tendency to cleft palate.

It is the distant results that the dentist sees, and, since it is at this stage his services are required, and the surgeon sees the patients only for a short time after the operation and often does not see the late results of his interference. The surgeon frequently has a higher opinion of his work than his colleague the dentist.

One might reckon that the modern operation is a combination of Lane and Langenbeck's operation associated with closure of the mucous membrane on the nasal side and a resuture of the muscles of the soft palate.

For the operation for cleft palate to be wholly successful, i.e., producing a perfectly normal speech, it should be done before the child has got into the habit of producing his speech abnormally. Theoretically, the best time would be in the first year, but the two great objections to this are : (1) the severity of the operation on a young infant, resulting in a high mortality; and (2) the practical difficulty to the surgeon of working in a very small confined space. For these reasons the operation is delayed till the child is between eighteen months and two years old. At this age the mortality is between two per cent. and four per cent. and normal speech is still to be expected after a successful operation without any speech training. The less speech training that is necessary the better, as it is often associated with abnormal grimaces. The early repair of the palate allows the pull of the muscles of both sides to work in conjunction. As the muscles of

the palate of both sides, acting in conjunction, contact, they pull the palate back and so cause it to lengthen (figs. L1 and L2). This lengthening tends to increase with age. The unrepaired cleft palate is essentially a very short palate (figs. K1 and K2), for hitherto the muscles on each side have been acting separately, and on contracting tend to pull that part of the palate to the side. There is no concerted pull backwards (fig. L1).



A B

Fig. J

The musculature of the soft palate in a case of cleft palate A compared with the musculature in that of a normal palate B. The muscles of the soft palate in the former are ill developed, and some have taken an abnormal attachment anteriorly to the edge of the palatine bone.

(After Veau, with kind permission of Messrs. Masson et Cie)

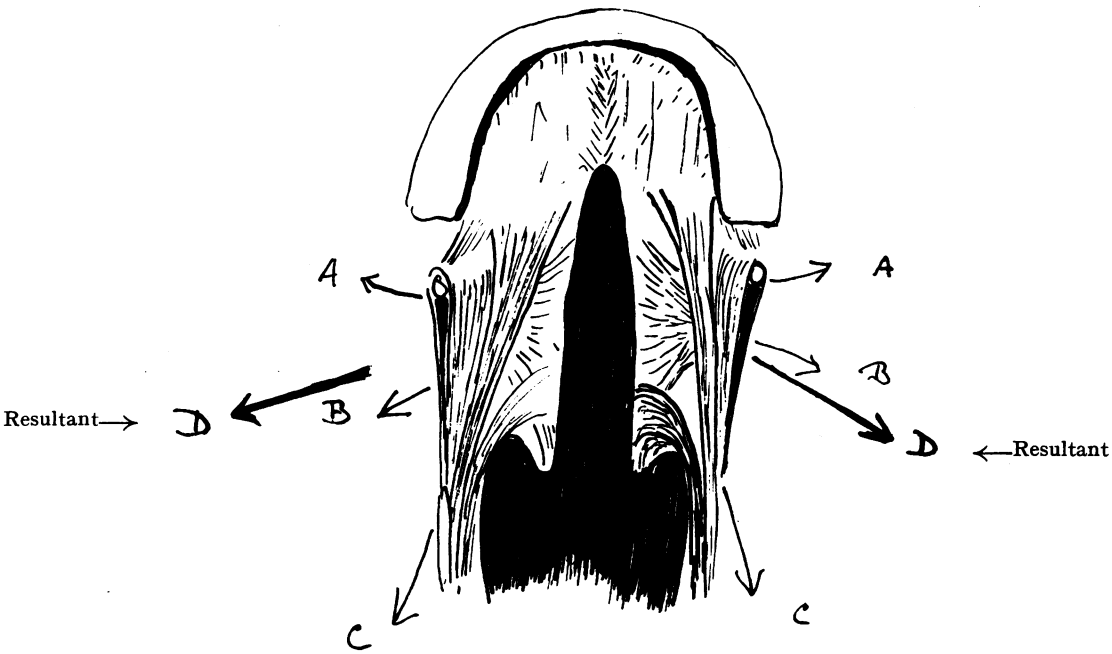


Fig. K1

In a cleft palate the muscles pull in directions A, B, and C, but as C has got some attachment to the post edge of the palate bone it is of little account in pulling back the palate; the resultant force is outwards and not backwards, and the palate tends to remain short.

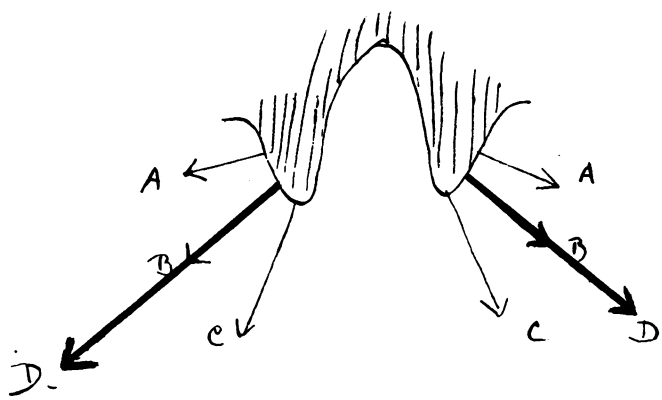


Fig. K2

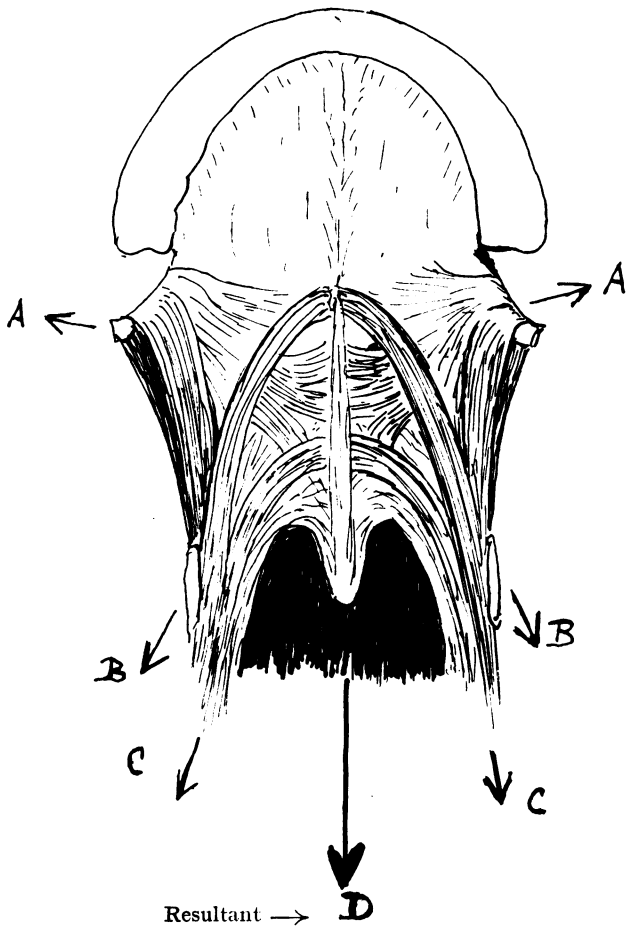


Fig. L1

In the united or normal palate the muscles are better developed and the resultant of the pull of the muscles is straight back (D), so lengthening the palate.

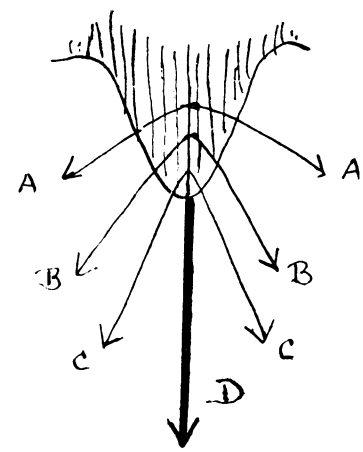


Fig. L2

Veau states he was stimulated by Lane's work on cleft palate. In Veau's operation the palate is divided into the nasal mucosal, the muscular, and the palatal mucosal layers. He lays stress on these points :—

1. On the suture of the nasal mucosa of one side to the nasal mucosa of the opposite side of the cleft or in too wide a cleft by using flaps of nasal mucosa from the vomer, in this way leaving no raw surface above to catch nasal drips of infecting secretions.
2. On bringing the muscles of the soft palate (fig. M) together, so causing a muscular palate.
3. On attempting to lengthen the palate by means of sliding flaps. (Wardill followed the same plans, but modified them by making his palatal mucosal

flaps shorter and by attempting to bring the ridge of Passavant forward.)

Denis Browne uses the first two principles of Veau, but does not construct palatal flaps and passes a stitch from the soft palate to behind the constrictor muscles at the ridge of Passavant, which, when tightened, pulls the soft palate back towards this prominence, and at the same time pulls the muscles of the palate of each side together.

From my own experience I am convinced of the necessity of the first two points stressed by Veau, i.e., the closure of the nasal mucosa, and, secondly, the suture of the muscles, but I have found no help in making flaps on the palatal side with a view to lengthening the palate. For, if these flaps are to produce any effect, it would be necessary to have corresponding flaps cut on the nasal side. It is the intact nasal mucosa that prevents these palatal flaps sliding back as theoretically planned and practised by Veau and Wardill. Latterly I have given up cutting these flaps, with no loss to the length of the palate, so that my present practice is to follow more closely the modifications suggested by Denis Browne. Two to three months before the operation on the palate the tonsils are dissected out, any marked adenoid removed, and the post-palatine arteries torn across. The actual operation on the palate consists of separating the muscles of the soft palate from the side walls of the pharynx, breaking the hamular process of the pterygoid, and deepening the separation right to the base of the skull; further forward the mucosa is separated from the rudimentary palate bone on the palate side; the posterior edge of this palate bone is completely freed, and on the nasal side the mucosa is separated from the free medial edge as much as possible. When well mobilised laterally, the two sides of the palate will be touching each other ready for suture (fig. M). There is thus no tension on the sutured palate, and the closure of the nasal surface prevents

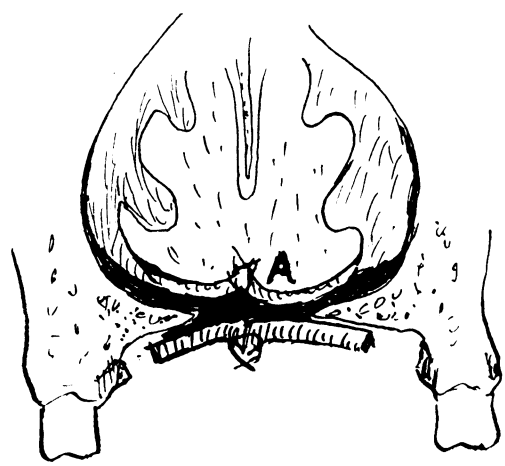


Fig. M

Note the closure of the nasal mucosa, shutting off droplet infection from the palatal suture line.

infection (fig. M). It is now the greatest rarity for a palate operation to break down. In the older operations break down of the suture line was common.

In this series there were over 100 operations—55 on the palate, and 46 on the lip. There were four deaths :—

One hare lip died following a misadventure the evening following the operation, although it had recovered from the operation.

Three died as the result of the cleft palate operation :—

One died in the early part of the series as the result of a kinked intracheal tube.

One died the evening following the operation. The child was in excellent condition, but started to vomit and suddenly died. This death may have been the result of a small clot in the larynx.

One died on the third day following the operation. The child seemed to be getting on satisfactorily after operation until the third day, when it appeared to be not so well. There was no respiratory distress. It died that evening. The cause of death was unknown;

so that there seemed to be two unavoidable deaths. One might estimate the mortality rate for a cleft palate operation about 2 per cent.

The child must be constantly supervised following operation. These children have had to change their method of breathing as the result of the closing of the palate and often find it difficult. In one patient with a short chin the breathing was so difficult that the Denis Browne muscular stitch had to be cut.

There were no complete breakdowns of the palate suture. There were three cases where a small opening showed itself. In one of these closure is expected without further operation. In one, a small anterior perforation was closed at a later date. One has a small hole in the side as the result of experimental cutting across the side flap in a Denis Browne operation, but the anterior blood supply was too poor and a small part of the flap necrosed. This opening does not affect the muscular part of the palate and will easily be closed by a transposed flap.

Speech result is excellent, i.e., normal, in all those operated upon when young. Older children, who had acquired a cleft palate speech before operation, did not gain perfectly normal speech, but their speech showed very great improvement. It is in this class of older children that the collaboration of the speech therapist is most necessary.

If a child has learned to speak before operation he will not just resume normal speech when he wakes up from the anæsthetic, but gradually he should lose his nasal tone, and it may be six to eighteen months before he speaks normally. Occasionally, operation does not produce a competent sphincter, and in these cases special speech training will be needed.

The longer the operation is delayed, the longer will it be before normal speech is attained. The older the child, the more difficult is it to train it to speak normally—ambition and environment are the main factors.

Occasionally a young child may have a normally functioning palatopharyngeal sphincter produced by operation, yet it is unable to use it in speech, and it must be trained.

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Types of Hare Lip

Plate A

1

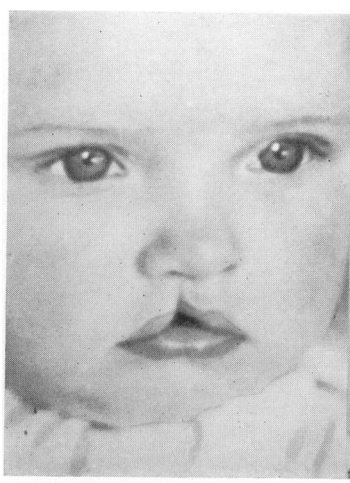
Complete facial cleft. Note the alveolus or palate is not affected. (Photograph by kind permission of Mr. C. A. Calvert).

2

Complete unilateral hare lip and cleft palate.

3

Bilateral hare lip and cleft palate. Note how the premaxilla is grossly misplaced forward, carrying with it the skin of the probrium, which projects beyond the tip of the nose.



4

Incomplete hare lip. The nostril is not involved.

5

Incomplete hare lip that appears median, but is in reality a left-sided hare lip. Note the unbroken skin with the muscle defect in the region of the defect.

6

A bilateral hare lip. The right side has been repaired, and only then did the left side defect become apparent.

Late Result of Old Type Operation

Plate D

1 2

(1) The operator in the case above has not paid attention to the replacement of the embryonic elements. Note the prolabium displaced under the columella and not brought down to the red margin.

It also shows how, by neglecting to form a floor of the nostril, a sinus exists between the nose and the mouth. No operation performed on the palate will produce good speech till this lip is undone and the floor of the nostril reconstructed.

Note the indrawn upper lip. The upper lip normally extends well beyond the lower lip.

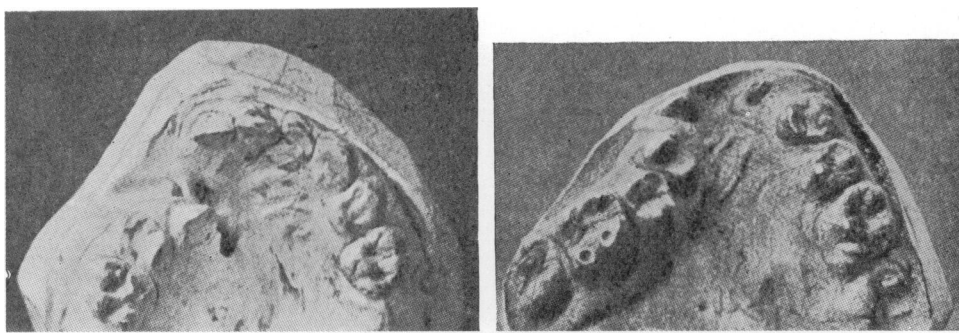
Late Result of "Non-Embryonic" Plastic Operation

Plate F

1 2 3

This shows the result of a non-embryonic operation. This boy had evidently had a bilateral hare lip and cleft palate. The result immediately after operation may have appeared good, but as growth took place the misplaced embryonic segments have exaggerated the difference from the normal. This child had to have the lip completely undone and rebuilt, bringing the embryonic elements back to their normal position so as natural growth might take place.

Plate H

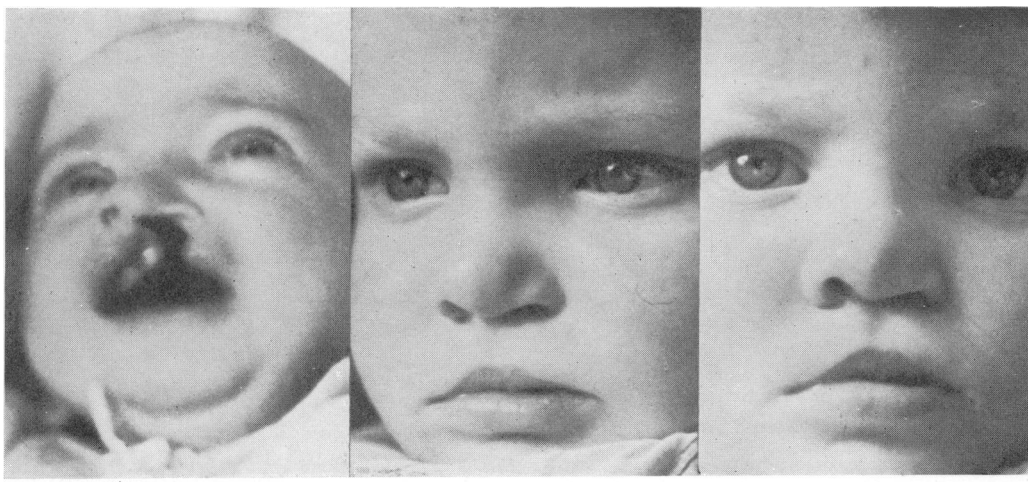


Casts to show deformities of the teeth following on the flap operation of Lane.

(By permission of British Dental Journal)

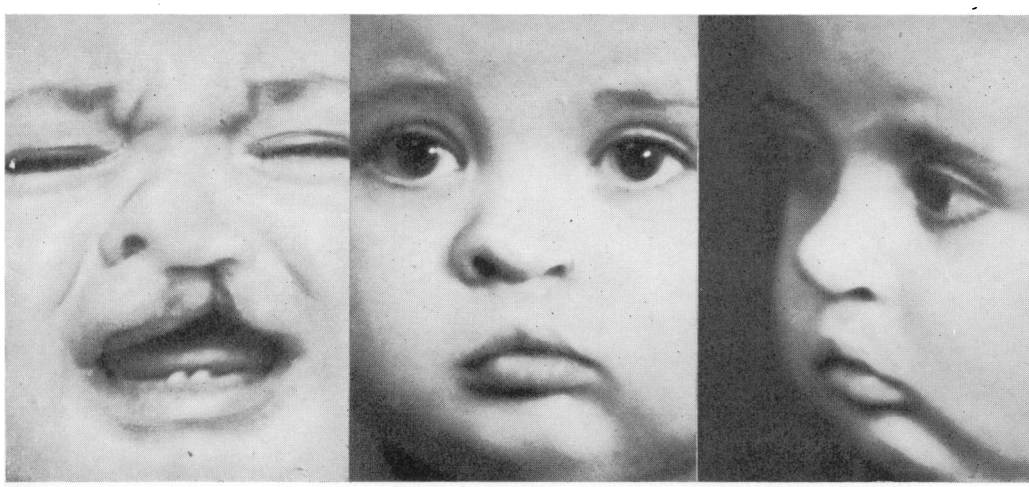
THE following illustrations are of complete hare lips with cleft palates which have been now repaired, and speech should be normal. Note the full, thick muscular lips, which project as in the normal beyond the lower lip.

Plate N



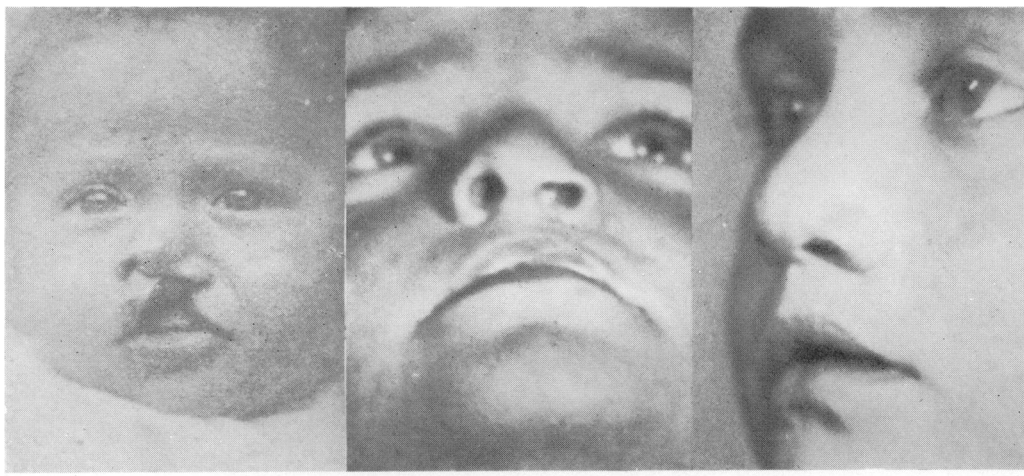
1 2 3

Plate O



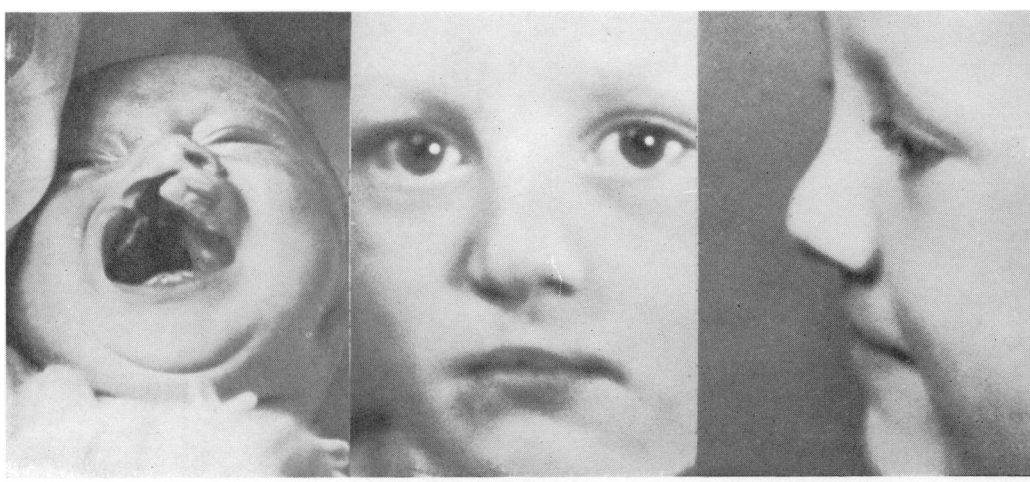
1 2 3

Plate P



1 2 3

Plate Q



1 2 3

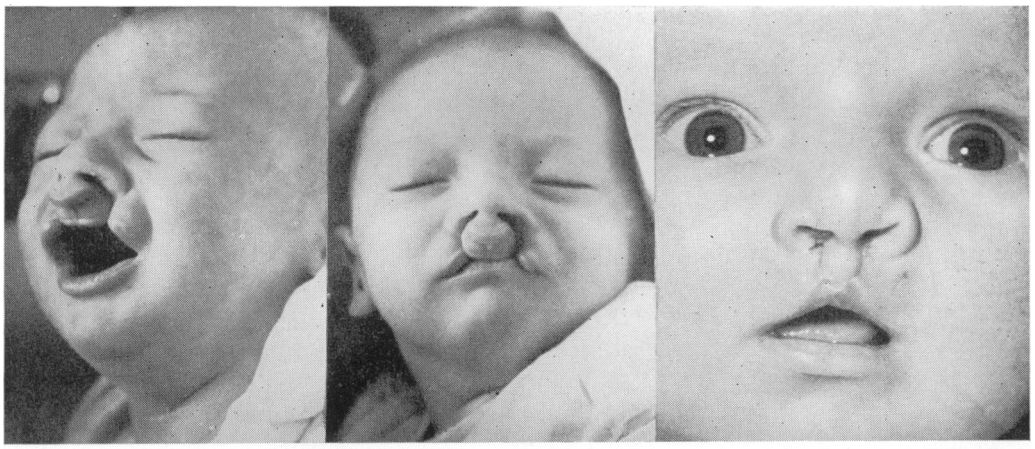
Plate R

1 2 3

Plate S

1 2 3

Plate T



1 2 3

(1 and 2) Double hare lip with marked protrusion of the premaxilla.

(3) The same shortly after operation (Denis Browne's). This is too early to determine the late success of this type of operation. This child's appearance two to three years later would be a better indication of the success of the operation.

Plate U

1 2 3

These children had had complete unilateral hare lips and cleft palates. Photographs before operation were not taken.

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Preventive Medicine and the Practice of Obstetrics

By A. T. ELDER, M.D., B.HY., D.P.H.

Deputy Chief Medical Officer, Ministry of Health and Local Government, N.I.

As Central Government, Hospital, and Local Government Health Services are now developing simultaneously in Northern Ireland (surely a somewhat unique circumstance), it might be deemed a suitable time for this study of preventive practice in midwifery.

And it might be asked—Can there be a lot to talk about? We have first-class teaching maternity hospitals in Belfast, with an extremely low maternal mortality rate, a comparative immunity from infection in the nurseries of maternity wings throughout the Province, and an overall maternal mortality rate of 1.9 per one thousand live births for 1947.

For the year 1947 the two large maternity hospitals in Northern Ireland—the Royal Maternity and the Jubilee Hospital (dealing largely with complicated cases)—returned maternal mortality rates of 4 per one thousand total births (approx.). During the year 1948 there were only two maternal deaths in the Royal Maternity Hospital, both of which were due to causes associated with pregnancy!

There is a great deal for us to think about, however, in the matter of provision of maternity schemes generally, both in and out of hospital.

For a study of any breadth and consequence one must rather shamelessly invade the territories of the obstetrician, the physician, the bacteriologist, the general practitioner, and the medical officer of health.

THE BACKGROUND OF THE CONTROL OF INFECTIONS.

There is much of interest in an article entitled "The History of the Belfast School of Obstetrics, 1793-1933," by Professor C. H. G. Macafee.[27] Much that is in this paper illustrates the truth of the impression often gained by the student of these matters, namely, that, in common with many another worthy project, the maternity services have developed in the face of oft-recurring opposition and petty obstruction. This is not a fact pertaining to Northern Ireland alone.

The Belfast Lying-in Hospital, the early predecessor of the present imposing building, was one of the oldest maternity hospitals in the British Isles, being the sixteenth to be founded between 1736 and 1799. This original hospital (first proposed in 1793) possessed six beds.

The training of nurses was first accepted only in 1879, and we are told that Professor Burdon, who played a large part in the development of obstetrical practice in Belfast, "during his eighteen years as professor, accomplished much in the face of narrow-minded opposition."

But as a curious anomaly, though many difficulties had been thrown in the way of the obstetricians by the physicians of the times, it was, amongst others, due to

the efforts of Professor Lindsay, "a physician gifted with long vision," that we owe the decision to erect the Royal Maternity Hospital (one hundred beds) opened in 1933 and built at a cost of £114,000.

We are told that, in 1837, the old Lying-in Hospital was ravaged by puerperal sepsis; this in common with the times. The mortality rates were high in hospitals throughout the country, but this is scarcely a true reflection of the maternal mortality rates generally of a century ago.

In the old Edinburgh Maternity Hospital, from 1823 to 1844, out of 3,906 deliveries there were in all 75 deaths, a mortality of 19 per 1,000, mainly due to sepsis. Dr. Douglas Miller considered it probable that, in 1840, the maternal death rate throughout the country was in the neighbourhood of 10 per 1,000 live births.[25]

With the assistance of the Registrar General's Department of Northern Ireland, I have been able to study the maternal mortality rates for Ireland, as a whole, as far back as statistics are recorded in print.

As I said, the mortality rate for Northern Ireland was 1.9 per 1,000 live births for 1947 (equivalent to an estimated rate of about 1.78 per 1,000 total births).

This figure has fallen to its present level since the years 1934-35, when it was in the neighbourhood of six. But previous to that, the rate had remained more or less stationary at between 6 and 7 per 1,000 live births for about sixty years up to 1900, uninfluenced to any material extent by even wars or Lister's discovery of antiseptics!

If wars played any part at all it was to show a slight reduction in the rate (Boer War and Great War (1914-18).

I am indebted to the Registrar-General in Northern Ireland for permission to reproduce the following comparative table and graph, which illustrates the fall during World War No. 2.

MATERNAL MORTALITY RATES IN NORTHERN IRELAND, ENGLAND AND WALES, SCOTLAND AND EIRE, 1922-46.

YEAR	ENGLAND AND WALES	SCOTLAND	EIRE	NORTHERN IRELAND
1922	3.81	6.6	5.7	4.7
1923	3.82	6.4	4.8	4.9
1924	3.90	5.8	4.8	4.5
1925	4.10	6.2	4.7	4.4
1926	4.12	6.4	4.9	5.6
1927	4.11	6.4	4.5	4.8
1928	4.42	7.0	4.9	5.2
1929	4.33	6.9	4.1	4.9
1930	4.40	6.9	4.8	5.3
1931	4.11	5.9	4.3	5.1
1932	4.21	6.3	4.6	5.3
1933	4.51	5.9	4.4	5.4
1934	4.60	6.2	4.7	6.3
1935	4.10	6.3	4.7	5.5
1936	3.80	5.6	4.7	6.1

Year	England and Wales	Scotland	Eire	Northern Ireland
1937	3.51	4.8	3.6	5.0
1938	3.37	4.9	4.1	5.3
1939	3.25	4.5	3.4	3.8
1940	2.78	4.4	3.7	4.2
1941	2.90	4.9	3.2	4.2
1942	2.56	4.2	2.5	3.0
1943	2.36	3.8	2.3	3.2
1944	1.98	2.9	2.4	3.1
1945	1.84	2.8	2.4	2.7
1946	1.47	2.3	2.0	2.3
1947	—	—	—	1.9

See chart of maternal mortality rates in Northern Ireland, England, and Wales on page 133.

In 1864 there were for all Ireland 879 recorded deaths from childbed causes against a figure of 136,414 live births, giving a rate of approximately 6.4 per 1,000 live births.

Between the years 1841 and 1851 there were 8,648 deaths, but against this average of 860 deaths per annum it must be remembered that the population of all Ireland was over eight million in 1841, falling progressively to less than six million in 1861, due mainly to emigration. As the population, and hence the numbers of live births reduced themselves, so did the numbers of maternal deaths reduce, leaving the actual death rate much the same year by year.

Since the number of hospital beds could not be many, compared with modern requirements, the maternal mortality trend reflects the degree of safety of the *domiciliary* practice of midwifery.

From 1936 onwards, with the discoveries of many more drugs of the sulphonamide group, and the subsequent introduction of penicillin, the death rate has come down spectacularly in all parts of the United Kingdom. We should consider (a) whether it is only in that part due to sepsis that improvement has occurred, (b) what other factors are playing an important rôle in the overall reduction in maternal mortality rates.

To assess this, it is necessary, first of all, to study the background of the more recent advances, first in the control of sepsis, and then in the overall advances in obstetrics generally.

Although much has been discovered relating to the nature of puerperal sepsis in the past ten or twelve years, the promotion of theories on the subject goes back a long time. There is always someone who sees the truth, or at least suspects it, long before it is actually proven.

Even as Patrick Manson talked of mosquitoes before Ronald Ross proved their relationship with malarial spread, and even as the Duchess of Cleveland was convinced of the means of preventing smallpox a hundred years before Jenner ventured on his trial vaccination, so we find that over a hundred years ago Pasteur was emphasizing the dangers of the human carrier.

This subject of the means by which infection is spread has engaged the attention

of research workers for the past fifty years. To begin with, there were several parallel lines of attack—one connected with the investigation of spread of infections generally and not necessarily associated with maternity work, a second about twenty to thirty years later connected with the study of infections in maternity hospitals, but lacking the advantages of modern bacteriological methods. About ten years after that the two ideas come together and real progress begins.

For instance, Power, in 1880-81, at the Fulham Hospital, studied the possibilities of aerial transmission of germs (in relation to smallpox), while, in 1897-99, Flugge and his pupils propounded the theory of more intimate contact and spread by droplet infection.[2]

In 1908 Biernacki introduced into the Plaiston Hospital the idea of "barrier nursing" by the use of visible screens, and in 1910 Crookshank, at the Bann Hospital, Mortlake, began a modified system of bed isolation.[2]

And although Kirstein[3] had thought of the possibilities of dust-borne infection in 1902, it was not till 1936 and 1938 that White and Cruikshank respectively studied the subject on a truly scientific basis.[3]

Elizabeth White recorded that in twenty-seven single-bed wards, housing patients discharging hæmolytic streptococci, the air was always contaminated by that organism, and the strain was identical with the strain from the patient.[1]

It was thought unlikely that a healthy throat carrier of hæmolytic streptococci would create a zone of streptococci-carrying particles around him (Colebrook, 1933).[1]

Cruikshank, in 1935, found that the air of wards where patients were being treated for burns frequently yielded strains, and interest in aerial spread of germs was thus re-awakened by the study of dust-borne infection.[2]

Also, in 1935, came Dora Colebrook's monumental work on "The Source of Infection in Puerperal Fever due to Hæmolytic Streptococci."

V. D. Allison linked up the various strains of streptococci, and then, in 1937, Brown and Allison carried out their interesting work of plating out organisms recovered from the air of wards housing patients suffering from scarlet fever.[2]

Finally, Godber and Cruikshank, in 1939, pointed out that the clinical case, the carrier, and the dust of wards must all be followed up for the various strains of prevalent germ and groups and serological types integrated.[2]

Research did not stop during the war years. Indeed, if anything, interest was quickened.

Van Den Ende, Dora Lush, and ff. Edward, writing in the *Lancet* in 1940, pointed out that viable streptococci could be recovered from the air of rooms in which blankets, artificially infected with streptococci, had been beaten and that the application of crude liquid paraffin to floors before sweeping greatly reduced the aerial contamination.[3]

A great deal was written concerning the technique of dealing with floors (Kenny & Barber[4]; Anderson, Buchanan, McPartland[5]; Harwood, Pownsey, Edwards[6]), etc., in 1944.

From 1941 interest developed in the scientific control of infections other than

puerperal, e.g., neonatal deaths (by the occurrence of high mortality rates in infections amongst the babies in the maternity hospital nurseries).

1945 to 1947 saw much study of this subject (Rubenstein & Foley, U.S.A., 1947[10]; Stern, 1947[14]; *Lancet* Leader, 1946[15]; Brown, Crawford, Stent, 1945[16]; Shera, 1947[17], etc.

Before Dora Colebrook's work, however, there had been a good deal of general study of puerperal infections by various public health workers.

For example, one might quote the clear-cut report of Sir Alexander McGregor on Puerperal Infection in Maternity Hospitals in Glasgow (1930),[7] and prior to that the Aberdeen Report on Maternal Mortality covering the years 1918-1927 (Kinloch, Smith and Stephen).[8] Their conclusion is worthy of repetition—"We take the view that the carrier physician, carrier nurse, and the carrier patient can spray streptococci on the sterilized hands, and sterilized instruments . . . (which) . . . in turn infected the maternal passages." A hundred years after Pasteur, we agree with him officially !

The report suggested the use of masks, methods of sterilization of hands, use of gloves, etc., and dealt with the dangers of infected dust and overcrowding.

Bacteriology, obstetric practice, and public health having come together on common grounds of scientific interest, there fall to be mentioned the Ministry of Health Reports of 1937 on Investigations into Maternal Mortality throughout England and Wales.[25]

These reports went much further than discussions of the control of sepsis, and opened up enquiry into maternal mortality in its widest possible sense.

To-day, when mortality rates are falling everywhere, there are so many factors now known to play a part in their reduction that an interest can be provided for all sections of the profession, each having his part to play in greater or less degree, though, as I hope to show presently, it will fall, in the end, to the obstetrician to set the seal on fifty years of intensive effort.

Technical Advances which have influenced the Modern Outlook.

I should like now to discuss the bacteriological aspects of prevention before proceeding to the more clinical and general aspects of administrative maternity schemes.

Bacteriology :

(a) *Laboratory Control of Puerperal Sepsis.*—The knowledge that bacteria could be found fairly easily in suspension on particles of dust from floors, furnishings, and bedclothes, and that dust-borne streptococci could be resistant to ultra-violet light rays and chemical aerosols (Twort, et al., 1940) led to the introducton of methods of reducing the dust in the atmosphere, or potential dust which might easily reach the atmosphere.

An Army experiment carried out in 1944 by Anderson, Buchanan, and McPartland showed, in a controlled experiment extending over three months, that where floors were oiled, the rate of respiratory infections contracted by the sleepers was considerably less than that where no oiling was done.[5] The practical objections to oiling are

apparent, and while Cruikshank stated (1939) that cleansing of polluted air by free ventilation and damp dusting and sweeping were two ways, probably effective, of preventing air-borne infection,[2] at the same time Leonard Colebrook came out strongly in favour of oiling in 1946. He says, "Oiling of floors once in every two to three weeks should become standard practice."[20]

Probably since little oil is required, the fault, if any, lies in too generous application with the production of over-sticky flooring. Objections to the oiling of blankets are dealt with by Colebrook, who suggests dipping blankets and woollen articles in special oil and opening out in a centrifuge. Steam heat at 5 lb. pressure for twenty minutes sterilizes the blankets and does not injure them.

Colebrook describes also the "slit-sampler" devised by Bourdillon, Lidwell, and Thomas for determining the bacterial content of the air. Air is sucked in by electric pump at a definite rate on to a slowly revolving blood-agar plate producing what might be termed a bacteriograph.

As with every discovery, newer and better methods soon come along, and Harwood and others describe a new technique for the application of dust-laying oils using Fixanol C and Teepol (1944).[6]

Much greater speed and accuracy in determining the source and hence applying effective control is possible with the development of knowledge regarding the typing of various strains of organisms.

Whereas early attempts at control were very general so far as the laboratory work was concerned, now great care in the taking of nose and throat swabs and provision for their proper bacteriological examination is required if potentially dangerous carriers are not to be missed.

As examples of this, may I mention just a few instances. Kenny & Barber (1944) describe seven cases showing the same type of organism and where the probable source of infection was traced to an infected lavatory seat.[4]

Dora Colebrook had previously illustrated the value of absorption—agglutinin methods. In one investigation of 837 women examined, two only of the fifty-two strains recovered were human pathogens, giving rise to a severe infection, while in another of forty-six severe cases, forty-five were infected by human pathogens.[9]

Although the next example is rather outside the subject of puerperal infection, it nevertheless is worthy of notice as illustrating the value of modern bacteriological methods. G. C. Williams and Carol Sims-Roberts described an outbreak of pemphigus neonatorum in a private nursing home (1947) due to phage type 3A staphylococcus aureus which was recovered from the bullæ of four cases, the nose and throat of one case, one baby with nasal discharge, one non-affected baby, and Nurse B (a heavy carrier).

Knox and Marmion (1945) described an outbreak of streptococcal infection due to Type 25 recovered by slit-sampler plate from air and dust and ultimately connected up with a sore finger of Sister R. The following statement is illuminating: "If a swab (of the finger) had been examined at that time, and if hæmolytic streptococci had been isolated, the whole outbreak might have been prevented."[22]

If I may seem to have laboured this aspect of prevention, let my excuse be that

I have known of several instances where control was held up by a reluctance on the part of those in charge, sometimes medical, sometimes nursing, to face the fact that the tracking down of such infection to the real source was not a reflection on the hospital, but a matter of great urgency, and that delay produced undesirable publicity instead of obviating it.

The other important lesson is the desirability of readily accessible first-class laboratory facilities.

(b) *Neonatal Morbidity*.—Let us consider for a little the prevention of gastro-enteritis among the newly-born in our maternity homes and hospitals.

The leader article of the *Lancet* (28/12/46) draws attention to two types of gastro-enteritis—(a) a mild type affecting babies and adults of all ages, and (b) a severe type affecting mostly infants under three months. The example given of the former was that at Cowley Road Hospital, Oxford, where twenty-nine babies were affected, with no deaths (60 per cent. of the mothers in hospital were affected also).

The severe type was exemplified by that at the Leicester General Hospital, where in a small outbreak with a high mortality twenty-five babies were affected, and there were twelve deaths.[15]

In regard to the mild type, Brown, Crawford, and Stent (1945) pointed out that an epidemic of diarrhœa and vomiting might run concurrently in people of all ages and sexes in the surrounding district, and was, therefore, a much more widespread problem than for the hospital alone.[16] A questionnaire sent out to general practitioners brought out these facts, but it was clear to me in my visits throughout the country that the widespread nature of this mild type was a fairly common occurrence.

Ormiston, summarizing the pathological findings in three outbreaks in 1941, demonstrated the negative nature of stool cultures in outbreaks with a case fatality rate of 29 per cent., and made mention of the fact that hospitals were unduly reticent when such outbreaks occurred.[11]

Sakula (1948)[12] and Shera (1947)[17] dealt with the morbid processes and stressed the probable virus origin of the disease, the virus probably affecting the gut with toxic manifestation in the liver and brain, and wasting of thymus and suprarenals.

Sakula mentioned that in his outbreak "breast-fed children remained well, while those receiving bottle feeds of whatever kind became ill," and Stern (1947), in dealing with an outbreak at West Middlesex Hospital, stated that "the only common factor was pooled feeding-bottles and teats."

Finally, in America, experiments in subjecting volunteers to inhalations of a mist concocted from the dried fæces of sufferers from gastro-enteritis were successful in producing gastro-enteritis in the volunteers. While this is not a conclusive type of test by any means, the sum total of these observations give a lead to the type of preventive action required.[31]

Now this preventive action is in no way different from action required for almost any type of alimentary infection, and in my own experience of severe outbreaks with as high a mortality rate as 33 per cent., an almost immediate control could be instituted even where one did not know any more than that there was the probability

of a severe virus type of infection. The full co-operation of the hospital authorities was, however, not always given to the field worker with that spontaneity and air of urgency which is so desirable where lives of babies are to be saved by immediate and somewhat drastic action.

This is not a fact that should be glossed over, and certainly no hospital authorities with the necessary breadth of vision would wish to gloss it over.

During a war urgent and drastic action may often require an amendment of accepted routine, and this is a "war" on disease, in which we must all play our part with the fullest co-operation.

Having mentioned the main discoveries and trends, let me now summarize the chief lines of action which have been advocated in control of epidemic disease of mothers and/or babies, but before so doing, may I just say that a routine which will ensure, as far as possible, total prevention of spread of infection is surely to be commended, even though it may interfere to some extent with nursing staff routine and teaching methods. Routine and teaching can be altered without detriment to the pupil's real interests.

Summary of Preventive Methods in Use and Advocated for the Control of Infections.

"The coming of penicillin, and the sulphonamides does not constitute any ground for complacency in the matter of puerperal infection," says Leonard Colebrook.

Practical steps which may be taken on the occurrence of a case are infinitely easier to remember than those less obvious steps which should be instituted as a routine to prevent infection arising. And mainly because the latter may cause a little trouble or effort to be made, for no apparent reason so far as the unthinking mind is concerned.

For instance, Kenny and Barber (1944)[4] give us two useful ideas arising out of their experience.

(a) That students and members of the staff should be "bacteriologically examined" before initial entry to the hospital, and on each return from leave. This would presuppose a ready and efficient laboratory service.

(b) Each patient admitted in labour has a shower-bath, and after being shaved has the vulva and surrounds painted four-hourly with dettol cream (30 per cent.) until delivery.

I need not detail the general measures to be taken on the occurrence of infections, except to say that the Medical Research Council War Memorandum No. 11 on "The Control of Cross Infection in Hospitals" would well repay close study by the profession and students at large.[2]

Cruikshank and Godber (1939)[2] pointed out that—

(a) "Patient contacts may become vaginal or cervical carriers of the epidemic streptococcus, and if not sought out may act as foci for the maintenance and spread of infection.

(b) Just as a streptococcal sore throat may be the source of an outbreak, so

secondary cases of tonsillitis may occur concurrently with infection of the genital tract; and

(c) Great care in the taking of nose and throat swabs and provision for their proper bacteriological examination is required if potentially dangerous carriers are not to be missed."

We read on page 19 of the War Memorandum No. 11 that "Noses, throats, and any discharges, abscesses, infected wounds, etc., of patients should be swabbed and examined for hæmolytic streptococci." The need for segregation of cases and carriers is stressed, and emphasis placed on unhealthy nasal passages or fauces. (Too often is a case with a slight temperature retained in the lying-in ward when removal to isolation is the obvious step to be taken.)

Sources of infection are summarized concisely as follows :—

(a) Respiratory : Nose and throat secretions, ear, mastoid and sinus discharges and sputum.

(b) Gastro-intestinal and urinary : Fæces, vomit, urine.

(c) Cutaneous : Discharges from septic skin lesions; discharges from mucous membranes, e.g., conjunctiva, vagina.

(d) Wounds : Discharges from septic wounds, burns, and abscesses.

Modes of spread in a hospital are by direct contact, by a variety of vectors ("mediate infection"), by droplets, and by dust.

I have already dealt with the dangers of shaken blankets, and the advantages of oiling and damp dusting.

Dealing with the hospital nurseries, the Memorandum stresses the importance of hand washing, but three pieces of advice are heavily underlined.

(a) *Breast-feeding.*—Breast-fed infants are considerably less prone to gastro-intestinal and respiratory infections than bottle-fed infants. Nursing mothers should, therefore, be urged to continue the breast-feeding of their infants in hospital. Every obstacle should be overcome.

(b) *Preparation of bottle-feeds.*—It is strongly recommended that nurses who change infants' napkins (or otherwise deal with excreta, or with septic conditions) should not prepare or give bottle-feeds.

(c) It is essential that all feeding-bottles, teats, and valves should be boiled after each feed.

Rubenstein and Foley (U.S.A., 1947)[10] state that the use of common utensils and materials is to be avoided. Common oil bottles and "sterilizing bowls" were found to become contaminated in time. Pasteurizing or autoclaving after the bottles have been filled is recommended.

Sakula (1948) stresses that—

(a) "Breast-feeding should be insisted upon.

(b) The preparation of bottle-feeds should be the sole responsibility of one person, who should not, at the same time, have any other duties which may bring her into contact with any possibly infected patient."[12]

War Memorandum 11 recommendation at (b) above and Sakula's views can only be met by the adoption of specialized nursing technique. This I have already dealt with in a short note on the value of task nursing (Monthly Bulletin, Ministry of

Health[19]) by which is meant the separation of the various nursing tasks into clearly defined and separate duties performed by different members of a staff which will help to create an efficient barrier to the spread of disease. (Report on Cross-infection in Children's Wards—British Pædiatric Association, 1946.)

I was pleased to learn, on arrival in Northern Ireland in 1947, that this system was already in use at the Belfast Royal Maternity Hospital and the City Hospital. Many teaching hospitals, unfortunately, still resist the introduction of these safety methods on the score that they "interfere with established methods of teaching."

General Factors which have Influenced the Modern Outlook.

We pass now to factors of more general interest. I have dwelt at length on the bacteriological aspects of prevention because of their importance in homes and hospitals.

A.—The Development of Team Work.

During the latter half of the eighteenth and all through the nineteenth century interest in preventive methods was being developed first by the physicians and then obstetricians helped (or hindered as was sometimes hinted by the physicians).

It was not until the twentieth century that the public health worker comes seriously into the picture. Then we have in sequence the combined efforts of public health and laboratory workers as in the Aberdeen Report, the Medical Officer of Health (Glasgow, 1930), bacteriologists and hospital workers (Colebrook, Cruikshank, etc., etc.), and lastly Government field workers and laboratory workers (war years).

Outside the realm of control of infections with the improvements in technique of blood transfusion, and the development of emergency obstetric units ("flying squads") have come closer working arrangements between the obstetrician, the general practitioner, and the medical officer of health.

Finally, the complete team-work can only be produced nowadays by the happiest of arrangements between obstetricians, practitioners, bacteriologists, and medical officers of health, linked when occasion demands with the field worker.

B. Hospital Considerations.

(i) *Bed and Cot Spacing.*—The "Report on an Investigation into Maternal Mortality" (Ministry of Health, 1937) states (page 229) that adequate floor space and fresh air in all lying-in wards is a necessity, plus the limitation of beds in each ward to a small number, and the provision of a large proportion of single-bed wards.

This remains substantially the modern view, upheld during the war years. Some controversy whether floor space should be at 96 sq. ft., 100 sq. ft., or 120 sq. ft. per bed has arisen at times, but in effect it is only when we go below 90-96 sq. ft. that real trouble by way of infection starts. There is thus a lower limit of safety. Hospitals well endowed with four to six bedded wards usually have a comparative freedom from infection because the smaller ward can be closed and disinfected, etc., more readily.

There must be a sufficiency of nursing staff, however, and wherever staff are overworked and rushed in their duties due care in matters of prevention cannot be observed no matter what floor area per bed is allowed.

Dealing with nurseries, Rubenstein and Foley remark that overcrowding in the nurseries is generally found where outbreaks occur. Thirty square feet of floor area per cot should be a minimum, they say, and no more than eight cots per nursery. Night duty was worst of all for provoking spread of infection (i.e., when least staff are on duty).

(ii) *Hospital Construction generally.*—Dealing with factors in hospital construction which have a bearing on prevention, Leonard Colebrook gives as his opinion that[20]

(a) Maternity hospitals should be built in separate blocks.
(b) There should be a more generous provision of single-bedded wards.
(c) All wards should be designed (especially as regards windows and fireplaces) so as to lend themselves readily to sealing for fumigation by formalin or other vapour.
(d) There should be separate quarters for nurses working on clean and septic cases, though they could mix when out of uniform.
(e) Hospital laundries should be equipped for oiling blankets and other woollens, and there should be separate plants for washing bedding from clean and infected wards.
(f) There should be proper ventilation of labour wards, etc., to ensure a dust-free atmosphere.
(g) There should be a 24-hour bacteriological service available in all the larger maternity institutions.

The need for adequate laundry facilities and the dangers of scrubbing infants' napkins out in the wards were pointed out in the Medical Research Council War Memorandum No. 11 (page 15).

(iii) *The Clyster Room.*—My mention of one outbreak of sepsis that possibly could be traced to an infected lavatory seat does not mean that this is by any means either a regular source of infection or one which must engage concentrated attention, but modern trends in the cleaning and sterilization of bedpans are interesting. While describing a modern type of bedpan unit, may I say also that in my experience of wartime emergency maternity homes where only simple chemical disinfection was resorted to, I never knew of any outbreak of sepsis due to infected bedpans, though, of course, I cannot deny that such an eventuality could have arisen.

The Clyster room, a good example of which was seen recently by our Northern Ireland representative at the Southern Hospital, Stockholm, provides accommodation for patients to use bedpan or W.C. to which they may be wheeled in a specially constructed chair with suitable seat opening.

The room can be made a complete unit or may have adjoining a bedpan unit comprising bedpan washer with flushing arrangement, bedpan sterilizer, bedpan hot drying rails, or hot-air cupboard and space for a wheeled bed.

(iv) *The Milk Kitchen.*—Although the need for breast-feeding and the establishment of human milk bureaux are matters of paramount importance, certain provision for the artificially-fed is necessary, and even in the smallest homes or hospitals, the milk kitchen has come to stay as an essential feature.

Colebrook stresses the need for a separate room or kitchen for the preparation of bottle feeds, with adequate refrigerator storage space.

The M.R.C. Memorandum[21] (page 17) advocates for central milk kitchens the following requirements :—

> "It should be reserved solely for the preparation of infant feeds; be situated as far as possible from sluices, water closets, etc.; be fly-proof; contain equipment for rinsing, cleaning, and sterilizing feeding-bottles, have running hot and cold water laid on, and be fitted with hand-basin, covered containers, racks for feeding-bottles, gas or electric cooker, refrigerator, etc. It should be in the regular charge of a sister or staff nurse who will supervize and teach nurses regarding infant feeds. Staff members should wash their hands thoroughly and don gowns and face-masks before starting work. They should be left free from interruption while in the milk kitchen. Unauthorized persons should not be admitted."

A useful idea suggested by the architect of the Northern Ireland Hospitals Authority permits of construction of the kitchen in two separate parts, one for the cleansing of used bottles, etc., and the other for the preparation of feeds, the two portions united only by the autoclave and a serving hatch. (Scatchard.)

(v) *The Premature Baby Unit.*—The development of such specialized units, served in the larger hospitals by their own milk kitchens, is an important addition to the hospital armamentarium. The most famous example is, of course, the Sorrento Unit, Birmingham, but units now exist in the main Belfast hospitals and are doing excellent work.

These units demand specially trained nursing staff, and one well-equipped unit can serve a wide area. At the same time, however, every one of the lesser homes and hospitals should possess some specially heated cubicle provision and equipment for the care of the premature baby, and be linked up with the domiciliary services for immediate urgent admissions.

Though material assets in the shape of specially heated and humidified wards, "cooling off" cubicles, etc., may be provided, the skill of the operator remains a paramount issue as with every other aspect of midwifery practice.

The possibilities of the adequate home nursing of premature babies has been recently discussed by F. J. W. Miller (Newcastle-on-Tyne).[30]

C. General Teaching over the Years.

Although I may seem to have concentrated on the utterances of various writers intimately interested in the prevention of infections, it would be a mistake to suppose that improvements and the prevention of ill-health, infection, and deaths of mothers and babies were not contributed to in large measure by the general trend of improved teaching, and central guidance over the years.

There is sometimes mistaken antagonism between the large teaching centres

and central and local government bodies, but each in their separate ways have been contributing progressively to the store of knowledge.

Viewing these things dispassionately, I find myself unable either to agree completely or to disagree completely with any particular sections of medical opinion. There are faults in all of us, be we obstetricians, practitioners, medical officers of health, or bureaucrats. But there is good in all of us too! It is to the sifting out of the good that is in us and the welding of it together, not omitting entire mention of the little bit that is lacking in us, that these next few pages are devoted.

References are made to illness and deaths associated with childbirth in the writings of the early exponents of public health, Grant and Farr,[25] and in the early days of World War I, Sir Arthur Newsholme produced a National Report for the Local Government Board. This and the National Surveys of 1937 were largely statistical, but were a tremendous step forward in bringing problems to light in the sense of being mass problems rather than individual, or belonging to any one medical school.

The organized activities of central and local government authorities in England date back to the end of the nineteenth century. The Notification of Births Act of 1907, the Maternity and Child Welfare Act of 1918, the Midwives Acts of 1902, 1918, and 1936 may be taken as landmarks, though the building up of local authority services has been a somewhat gradual process from which the interest and help of the obstetricians has not been divorced, and indeed has reached a point of extremely close contact prior to the passing of the National Health Service Act (e.g., Croydon[29] and other County Boroughs).

I venture to suggest that complete integration of all maternity services was on its way whatever legislation had occurred in the meantime.

Now I should like to take you back twenty odd years to Glasgow in the years 1921-28. The maternal mortality rate varied from 6.37 in 1921 to 8.78 in 1928, and as a main contributing factor puerperal sepsis accounted for seventy-nine of the two hundred and eight deaths in 1928 (3.34 per one thousand live births).[13]

Had sepsis been wiped out completely in the intervening years we should still have had a comparatively high rate without some other important reducing factor.

Albuminuria and eclampsia accounted for 1.52 per one thousand live births, hæmorrhage .63, and other accidents of parturition .97. Toxæmia represented by uncontrollable vomiting, albuminuria and eclampsia caused forty-seven deaths.

Turn now through a few years to figures given in the Ministry of Health Report of 1937.

I reproduce below a table which classifies the percentage causation of deaths directly due to childbearing.[25]

Cause of Death	Present Enquiry		Departmental Committee Reports on Maternal Mortality and Morbidity			
			Interim Report, 1930		Field Report, 1932	
	No. of Deaths	Percentage	No. of Deaths	%	No. of Deaths	%
1. Sepsis	219	34.2	616	38.6	1,111	36.3
2. Eclampsia	73	11.4	218	13.6	326	10.6
3. Operative Shock	62	9.7	145	9.0	319	10.4

Cause of Death	No. of Deaths	Percentage	No. of Deaths	%	No. of Deaths	%
4. Antepartum Hæmorrhage	52	8.1	125	7.8	248	8.1
5. Postpartum Hæmorrhage	21	3.3	92	5.7	204	6.7
6. Other Toxæmias	68	10.6	99	6.2	180	5.8
7. Embolism	28	4.4	113	7.0	206	6.8
8. Abortion	104	16.3	168	10.5	410	13.4
9. Extra-uterine Gestation	13	2.0	20	1.2	55	1.8
Totals	640	100.0	1,596	99.6	3,059	99.9

As you will see, one-third of the deaths was accounted for by sepsis, a tenth by eclampsia, about a fifth by shock and hæmorrhage, one-sixth by abortion.

A report issued by the Department of Health for Scotland in 1935 dealt with 2,527 maternal deaths, and concluded that the percentage of avoidable deaths was 58.7, of which 21.6 were due to negligence of the patient, and 37.1 to faulty technique on the part of the attendant.[24]

	Number of Deaths	Percentage
Sepsis	1,727	37.1
Eclampsia	544	11.6
Operative Shock, etc.	464	9.9
Antepartum Hæmorrhage	373	8.0
Postpartum Hæmorrhage	296	6.3
Other Toxæmias, including chorea and mania	279	6.0
Embolism	319	6.8
Abortion	578	12.4
Extra-uterine Gestation	75	1.6

Now, you see still over a third due to sepsis, over a ninth due to eclampsia, approximately a fifth to hæmorrhage and shock, and one-eighth to abortion.

The figures from the last annual report of the Ministry of Health in England for the year ended March, 1947, are as follows :—[28]

	Number of Deaths	Percentage
Sepsis	70	9.1
Hæmorrhage	122	15.9
Toxæmia	188	24.4
Embolism	58	7.5
Other causes directly associated with child-bearing (mainly obstetric shock)	112	14.6
Ectopic Gestation	22	2.9
Abortion (Septic 28)	66	8.6
Associated conditions	131	17.0
	769	100.0

In 588 cases antenatal care was given as follows :—

By Hospital	83
Antenatal Clinic	138
,, + doctor	10
,, + midwife	28
Midwife	99
Doctor and Midwife	38
	588

"Local investigators reported that in 284 of the total of 769 cases there was an accessible avoidable factor, whilst in 308 cases it was stated that no such factor existed. In 177 cases no opinion was expressed.

Avoidable factors were set out as follows :—

Lack or inadequacy of antenatal care	86
,, ,, ,, ,, obstetric facilities	59
,, ,, ,, ,, hospital or specialist treatment	46
Lack of co-operation of patient or her friends	70
Unsatisfactory home conditions	2
Poor general health or malnutrition	18
Risk of pregnancy should not have been taken	3

In only thirty cases were consultants called to patients in their own homes. In eight instances they were called during pregnancy, in nine during labour, and in thirteen during the puerperium.

Thus, in 67 per cent. of the cases specialist obstetric supervision either was lacking or rather might have been lacking, and might have made a difference if readily available. Obstetricians would, of course, say definitely would have made all the difference!"

The maternal mortality statistics for Northern Ireland for 1947, subdivided according to health authority areas, give the following table :—

	Per 1,000 live births
Belfast	1.28
Londonderry City	2.08
Co. Antrim	1.77
Co. Down	3.01
Co. Londonderry	1.11
Co. Armagh	2.30
Co. Tyrone	4.34
Co. Fermanagh	3.18

The Registrar-General for Northern Ireland gives the following sub-classification of all maternal deaths for the Province for 1947 per one thousand live and still births (the latter estimated only).

Cause	No. of Deaths	Rate per 1,000 total births
1. Hæmorrhage of Parturition and Puerperium	19	0.58
2. Infection	9	0.28
3. Toxæmia of Pregnancy	7	0.21
4. Puerperal Toxæmia	5	0.15

Cause	No. of Deaths	Rate per 1,000 total births
5. Cæsarean Operation - - - - -	4	... 0.12
6. Obstetric Shock - - - - -	3	... 0.09
7. Rupture of Uterus - - - - -	3	... 0.09
8. Retained Placenta - - - - -	2	... 0.06
(a) Hæmorrhage (1)		
(b) Shock (1)		
9. Abortion, including infection following abortion -	2	... 0.06
10. Hæmorrhage of Pregnancy - - - -	1	... 0.03
All causes - - - -	55	... 1.67

Infection no longer appears as the major factor. It occurs, but owing to the availability of effective modern remedies it does not cause many deaths. It could be eradicated as a cause altogether.

Abortion has disappeared as a major issue. Is this because the fear and secrecy associated previously with illegitimacy has disappeared, or is it because of the disappearance of the septic factor associated?

Notice, however, that whereas there is now an improvement in all returns and figures over the past ten years, and whereas eclampsias and albuminurias have ceased to be a major worry, hæmorrhage, shock, and accidents (one-third all told) remain as a guide to what is required now.

Can we safely say that modern drugs have played their part, ante-natal services have played their part, improved obstetrics has played its part? But what is still to be done and whose job is it to do it? In analysing this we must keep the foregoing figures in mind all the way.

And this leads one to the reflection that the standards of midwifery practice can no longer be assessed properly by maternal mortality returns, though these are necessary and a help, but a truer reflection, possibly the only true one, is to be had from the gynæcological wards, gynæcological out-patient clinics, and post-natal clinics.

As to maternal mortality returns, it is right that the results of investigations should be published, though not so much in condemnatory fashion as by way of material for careful study. To this end the employment of obstetricians of fairly senior status for the personal and local investigation is a logical and reasonable proposal, and one that would appeal to all branches of the profession. Both public health and hospital authorities should be in possession of, and take part in the assessment, the summarized results.

The Domiciliary Maternity Services.

The position in Northern Ireland differs somewhat from that in England, in that every expectant mother is guaranteed both a midwife and doctor should she so desire, and also any doctor may take part in the service.

Now this development presupposes two things if we are to make it a success. (a) The midwife will, by the nature of things, come to act instead of the maternity nurse since most mothers will want a doctor too. Thus, close harmony between doctor and midwife working as a team must exist, and (b) The general standard

of midwifery of the medical profession as a whole must be maintained at the highest possible level since all may take part, and not just those with special qualifications and experience.

The supply of trained midwives is giving a little difficulty in regard to geographical distribution and domicile at present, but will even itself out, and there will be sufficient numbers to ensure an adequate service.

At present, for lack of numbers in various parts of the country, the nurse-midwife continues to fulfil a variety of duties.

In another article (*Medical Officer,* 6th March, 1948) I have drawn attention to the extending scope of the work of the trained midwife, and on this score, and the score of lessened risk of conveyance of infection, a full-time *ad hoc* midwifery service is to be preferred.

To arrive at a true picture of these factors in a well-balanced scheme, let us consider first the ante-natal clinic, and its value to the community.

The Ministry of Health Report of 1937 stated that "supervision of expectant mothers should be preventive in outlook, and educative, and ought to be instituted at as early a stage as practicable, and regularly maintained throughout pregnancy."

Mention is made of the early interest of the health visitor, and of the midwife too. The duties of the midwife during the ante-natal period are set out in the rules of the Central Midwives Board. Apart from the universally accepted hospital ante-natal clinics and consultative clinics, the report urged that an ante-natal clinic should be established in every district where the number of expectant mothers justified such a provision. "The function of the clinic is twofold, (a) to act as a centre for the routine examination and education of pregnant women, and (b) to sift the abnormal from the normal."

Now to do this the report urged at the time certain advice as to the medical staffing, and the duties of consultants. I should like to quote two passages, for they have a bearing on what we should like to do here in Northern Ireland (and I would ask the reader not to jump to conclusions till he reaches the final suggestions below !)

"(a) The officer in charge should work under the administrative direction of the Medical Officer of Health for the area, and such officer should hold the Diploma of Public Health, and in addition to experience in child welfare, *should have acted for a period of not less than six months as a resident obstetric officer, etc., etc."*

"(b) The duties of a consultant, under the administrative supervision of the M.O.H., should, wherever practicable, include :—

(i) Assistance to general practitioners in domiciliary cases, etc.
(ii) Attendance at consultative ante-natal clinics, etc.
(iii) Clinical charge of the maternity department of the area.
(iv) Clinical charge of the puerperal sepsis unit.
(v) Attendance at post-natal consultative clinics.
(vi) The investigation of circumstances associated with maternal deaths in the area."

Hilda Menzies,[23] writing from the Leyton Public Health Department in the

Medical Officer of 6th November, 1948, after mentioning damning criticism of local authority ante-natal clinics in the report of the Royal College of Obstetricians and Gynæcologists of 1945, proceeds to defend the municipal clinic. She points to the large numbers of women who benefit by advice at these clinics and to the average mortality rate in Leyton being much less than that for England and Wales as a whole.

Her article, as did the many reports before this, simply bears out once more the value of routine ante-natal supervision. My analysis of causes of death down through the years has, I think, pointed in this direction also, but as I have also indicated the maternal mortality rate cannot be accepted as the only foot rule for assessment.

The salient features, I imagine then, are as follows :—

(1) Outside the hospitals there is a need for ante-natal clinics in suitably selected areas for the convenience of the mothers.

(2) Attendance of the health visitor, and the midwife who will subsequently attend the case, is desirable (as in the Croydon scheme). These are health authority employees, and the domiciliary services are vested by law in the health authorities. It follows that the medical officers of health will be interested administratively in the scheme.

(3) The doctor operating the clinic should have resident obstetric experience, and a consultant should attend on occasion.

(4) Routine preventive "screening" of all primiparæ and high grade multiparæ is justifiable because the general practitioners would welcome help from someone specially versed in obstetrics, and this is all the more desirable if all doctors are to join the scheme.

(5) It may be wasteful to have a consultant in attendance for all routine screening, hence the junior grade of obstetrical officer should be employed in this. Such an officer cannot give of his or her best without also a hospital connection, viz., registrar part-time.

I would, therefore, advocate :—

(i) Ante-natal clinics to be set up outside hospitals by health authorities, and equipped by them and staffed by them as far as nursing attendance is required.

(ii) The medical staffing should be allocated by the Hospitals Authority—consultants as required for special sessions, routine to be carried out by junior obstetric officers of the registrar grade, who would also operate the Emergency Obstetric Service (Flying Squad) for the area.

I have not mentioned "gastro-enteritis" teams, the Rh factor, radiology or anæsthesia, not because these things are unimportant, but because they do not bear directly on the administrative action required in the scheme. I may mention in passing that gastro-enteritis is now a notifiable disease throughout Northern Ireland (as from January, 1949).

A word or two may be opportune in regard to forceps deliveries. It has always been drummed into us by those who know best that unhurried midwifery is the safest midwifery, and this fact needs no further emphasis from me. We can achieve

this if doctor and midwife work as a team. The doctor is a busy man, but with a trained midwife acting as his maternity nurse, and especially since such midwives are now trained to use analgesia, a happy working arrangement that will allow of the doctor being called judiciously, may allow of the time factor being given its opportunity as has never been properly done in the past.

A thought should be given to the need for refresher courses of instruction for practitioners taking part in the Domiciliary Midwifery Services.

For the rest, we are always learning!

Conclusions.

I have tried in this all-too-short paper to study the more important trends and developments in the maternity services in and out of hospital, which are of greatest interest to those concerned with the administration of the services, and with the accent on prevention.

Modern developments in the accuracy of bacteriological investigations have been discussed, and three ideas emerge which are of major importance :—

(a) The need for a readily accessible first-class laboratory service in all maternity work.

(b) The need for a 24-hour laboratory service for all major maternity institutions.

(c) The need for team-work of the closest nature between obstetricians, administrators, and laboratory workers.

Certain structural changes in maternity hospital design have been dealt with, and certain essentials in nursing technique and staffing arrangements, with particular reference to gastro-enteritis in nurseries.

The trend of maternal mortality rates has been traced over the past fifty to a hundred years, with particular reference to Ireland.

The desirable administrative features of a good domiciliary midwifery service have been discussed, and with particular reference to the special position of Northern Ireland.

The need for readily available consultant obstetric facilities within the framework of a health authority scheme for domiciliary midwifery has been discussed, and it has been pointed out that the truer reflection of standards of midwifery lies in the study of cases in gynæcological wards and out-patient gynæcological and post-natal clinics rather than in any further study of maternal mortality rates, though such studies are of value.

To finish, may I commend two impressions I have gained from this study. The first is that any enquiries into maternal deaths or consultant advice given out should not sound a condemnatory note, but rather be carried out or given in a sympathetic form for the benefit of subsequent patients, for are we not all striving towards perfection all the time? Secondly, I would commend an intimate assessment of gynæcological conditions seen at hospitals and post-natal and gynæcological clinics by our professors of midwifery and of social and preventive medicine, for the benefit of our future doctors and their trusting patients.

I am indebted to the Chief Medical Officer, Dr. James Boyd; to Professor

C. H. G. Macafee; to Professor J. M. Biggart; and to Mr. John Oliver, for helpful criticism and useful suggestions, and my thanks are due to the Ministry for permission to publish this article.

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REVIEW

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Messrs. E. & S. Livingstone have produced a very attractive volume which reaches or perhaps surpasses pre-war standards of paper, printing, and illustration. Volume II is to follow when more dissection has been carried out. Attempts will then be made to prove points and present new theories. In the meantime, Volume I can be recommended as a thought-provoking book which raises and discusses many varied topics. Professor Hartridge, in his foreword, states that he found it absorbing. Others are likely to do so too.

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J. A. C.

A Statistical Review of the Trend of Infant Mortality in Northern Ireland during the period 1922 to 1947

By E. A. CHEESEMAN, B.SC.(ECON.), PH.D.
Lecturer in Medical Statistics,
Department of Social and Preventive Medicine,
The Queen's University of Belfast

INTRODUCTION

IT has been stated that, by means of the infant mortality rate, "the stage of evolution reached by any given population can be measured; it is a measure of people's progress" (Crew, 1948). This implies an association between the infant mortality rate, on the one hand, and social and environmental conditions and medical care of infants on the other. As Martin (1949) reminds us, there are a great number of factors known to affect infant mortality, and, although these are very much interrelated, he suggests that they can be classified broadly as "(1) conditions which affect the whole population; and (2) conditions specific to infancy."

A voluminous literature exists on the subject of the relationship between infant mortality and the two groups of factors categorised above. As far as is known, with the exception of the work of Deeny and Murdock (1943 a and b) on infant mortality in Belfast, no attempt has been made to consider the trend of infant mortality in Northern Ireland from these aspects.

The present paper is an attempt to review various aspects of the trend of infant mortality over the past twenty-six years, using the available published statistics (Registrar General for Northern Ireland, Annual Reports 1922-1947). It is hoped at a later date, when more up-to-date information is available about the living conditions of the population, to examine this mortality trend in relation to the ascertainable changes which have occurred in environmental factors, such as has been done elsewhere.

TREND OF INFANT MORTALITY, 1922-1947

It is appropriate that the trend of infant mortality in the Province should be compared with that observed elsewhere in the United Kingdom. Between the years 1922 and 1947 the rate in Northern Ireland has fallen by 31 per cent. of its initial level—a decline from 77 to 53 deaths of infants under one year of age per one thousand live births. Both in England and Wales and in Scotland the relative decline in the corresponding period has been somewhat greater, and is of the order of 55 and 45 per cent. respectively. In England and Wales the rate in 1922 was the same as that in Northern Ireland (77 deaths per one thousand live births), but by 1947 the English rate had fallen to 42 per one thousand, which is less than that for Northern Ireland by 11 deaths per one thousand live births. In Scotland

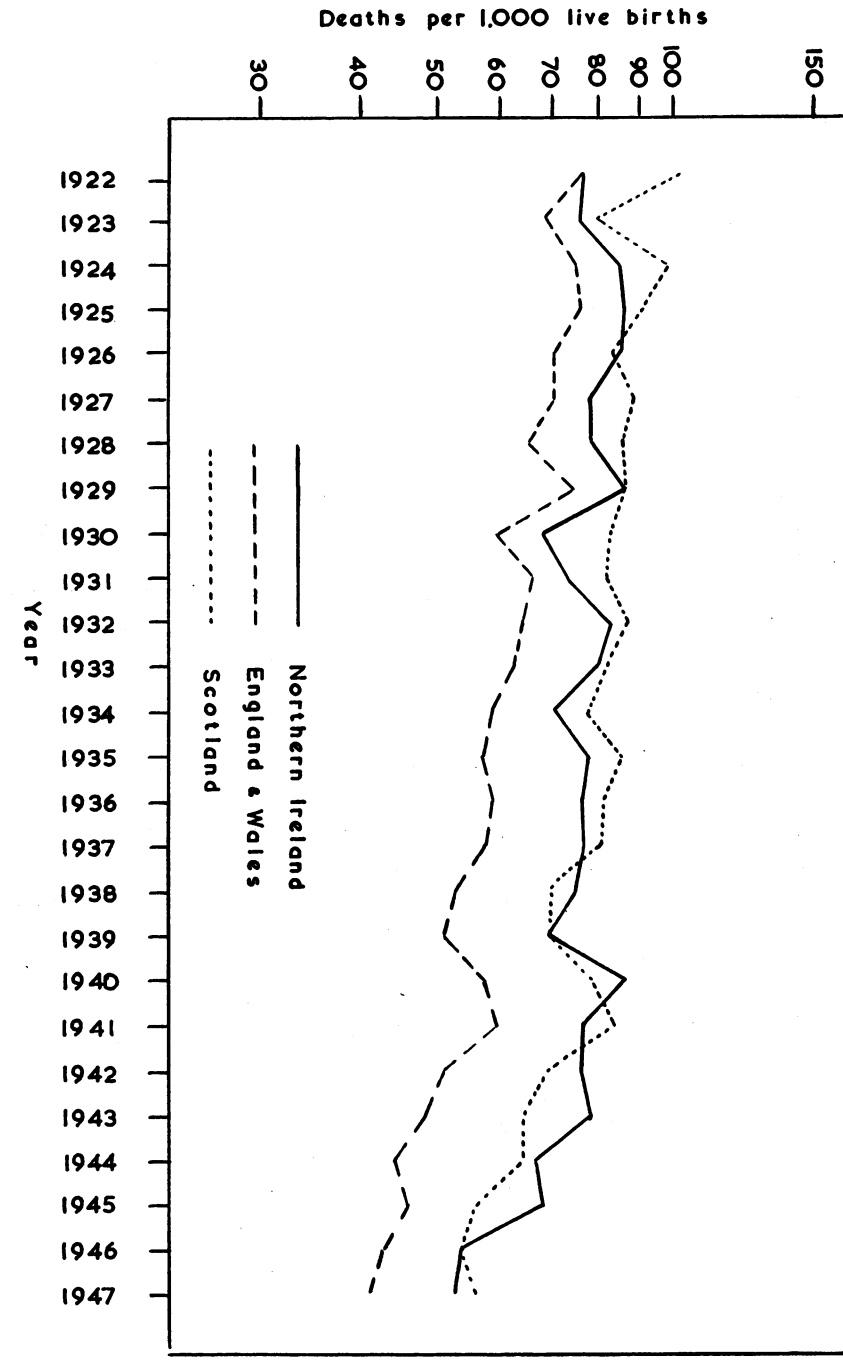

Fig.I Infant mortality rates in Northern Ireland, England & Wales and Scotland

the mortality level in 1922 was considerably higher than it was in either of the other two countries—101 compared with 77 deaths per one thousand live births—but a rapid fall in mortality resulted in the rate approximating closely to that of Northern Ireland by 1947 (56 compared with 53 deaths per one thousand live births).

The comparison of trends in terms of the first and last rates over a period of twenty-six years might be misleading. Consequently, figure I has been prepared to show the annual rates for each country. The mortality rates have been plotted on a logarithmic scale, which permits a direct comparison of the relative changes in the rates—by comparing the slopes of the lines, while preserving the comparison of the absolute levels of the rates—by the position of the plotted points on the lines in relation to each other.

The graph for Northern Ireland presents a somewhat different picture from those for the remainder of the United Kingdom. In England and Wales the general trend of the rate has been steadily downward over the whole period—in point of fact, the rate has been declining exponentially since the beginning of the century in that country (Martin, 1949). In Scotland the general trend has been similar to that south of the border, with possibly less annual fluctuation, although the absolute level of the rate has generally been higher. In contrast, the decline in infant mortality in Northern Ireland has not been apparent throughout the whole of the twenty-six years.

Evidence of a definitely declining infant mortality rate is not easily found in the Northern Ireland experience until as late a date as 1940. The words of the Registrar General for Northern Ireland (1948) adequately sum up the trend in the period under review, although he is inclined to fix the onset of declining mortality somewhat earlier :

"These rates in Northern Ireland averaged 79 per one thousand live births between the years 1922-1935. Wide fluctuations were, however, experienced during this period, the peaks being mainly due to small epidemics in certain diseases, e.g., enteritis and measles. Peak figures were recorded with a rate of 86 in each of the years 1925, 1929, and 1935, representing 2,391, 2,174, and 2,136 deaths per annum respectively. Since 1936 the downward trend has been continuous, except for a break in 1940 caused by increases in various diseases, mainly diarrhœa and enteritis, which resulted in a rate of 86 being returned in 1940, as compared with 70 in 1939." In fact, the rate did not fall below its 1939 level for another four years, when, in 1944, a mortality of 67 deaths per one thousand live births was recorded, as compared with 78 in the preceding year. Over the years 1945, 1946, and 1947, a striking fall in mortality amongst infants has occurred—the rates reported were chronologically 68, 54, and 53 deaths per one thousand live births. In other words, the infant mortality rate fell almost continuously between 1943 and 1947 by as much as 32 per cent. of its 1943 level.

It is reasonable to conclude that, unlike the experience in the rest of the United Kingdom, in Northern Ireland the decline in infant mortality is a comparatively

recent phenomenon. Between 1943 and 1947 the rate at which mortality has fallen in the Province was considerably faster than that in the same period, or for that matter in any period of equal length, during the past twenty-six years, in either England and Wales or Scotland. With a level of 53 deaths per one thousand live births in Northern Ireland in 1947, there would appear to be scope for still further reduction when it is considered that levels as low as 23 and 21 deaths per one thousand live births have been reported from New Zealand and Holland (Joint Committee of the Royal College of Obstetricians and Gynæcologists and the Pædiatric Association, 1949).

Infant Mortality and Age at Death

The Registrar General for England and Wales (1947) drew attention to the fact that after the first week of life, at all age periods examined, mortality of infants declined in that country between the quinquennial periods 1906-10 and 1931-35. However, the decline in infant mortality, wherever observed, has not been uniform at all age periods in the first year of life. For example, if the rates at various age periods in England and Wales for 1939 are expressed as percentages of the corresponding rates in the five-year period 1906-10, the differential rate of decline is clearly demonstrated by the variation of these percentages between age groups :—

England and Wales

Infant Mortality rates in 1939 as percentages of the corresponding rates in the period 1906-10

Age Period	Percentages		
0—1 day	89	86	
1—7 days	84		
1—2 weeks	53		70
2—3 weeks	39		
3—4 weeks	41		
1—3 months	35		
3—6 months	32		
6—9 months	25		
9—12 months	20		

Except for a slight interruption in the fourth week of life, the relative decrease in mortality increased with increasing age at death. Such results are substantiated by the more mathematical approach by Martin (1949), who showed that the average annual rate of decline in mortality during the period 1906-45 was 0.44 per cent. in the first day of life, 0.63 per cent. in the age period one to seven days, and that at later age periods the average annual rate of decline was never less than 2.40 per cent., increasing from this figure in the age period one to four weeks to 4.47 per cent. in the period nine to twelve months.

Sutherland (1946) has mentioned that the comparatively slow decrease of neonatal mortality (deaths in the first four weeks of life per one thousand live births)

is closely allied to the stillbirth rate, while, on the other hand, " . . . it is well recognised that mortality at ages three to twelve months is closely associated with bad environmental conditions." He stressed that neither neo-natal mortality nor the stillbirth rate gave such high correlation with environmental indices, as did mortality in the last nine months of the first year of life. Earlier, Martin, Russell and I (1939) commented upon the increasing part played by environmental conditions on the mortality of young children as age increases. From the English data which we used, it appeared that better chances of survival in infancy occurred in that period of infant life which was most susceptible to environmental improvement. In view of these pronouncements it is of interest to observe the comparative decline at different age periods of infant mortality in Northern Ireland.

Data are available in the annual reports of the Registrar General for Northern Ireland for such an examination over the whole period 1922-47. The results are summarised in Table I. Before 1929 neo-natal deaths were not sub-divided into smaller age periods in the official reports; consequently, the trends of rates for these young age groups can only be shown from 1930 onwards. Comparison of rates in small age groups, or small areas, is complicated by the occurrence of occasional fluctuations from the general trends and by occasional abnormally high annual levels of some rates. For the purpose of this review, such irregularities or abnormalities are not of primary interest, and the trends have been "smoothed" by presenting the rates in Table I in thirteen two-year periods, 1922-23 to 1946-47. To facilitate the comparison of relative changes in the rates at different age periods, the absolute rates have been supplemented by expressing them as percentages of the corresponding rate in the period 1930-31. The latter is the first two-year period for which rates are available for all the age periods tabulated.

Before studying the detail of Table I, the general description of the differential age influence can be seen from figure II. Here the relative changes in neo-natal mortality and post-natal mortality (deaths in the last eleven months of the first year of life per one thousand live births) are shown side by side with the total infant mortality experience.

The trend of post-natal mortality has been closely parallel to that of total infant mortality; the trend of neo-natal mortality, on the other hand, is rather different. Post-natal mortality declined from 46.0 to 28.3 deaths per one thousand live births between 1922-23 and 1946-47, and throughout the twenty-six years the decline has been fairly continuous, although some minor fluctuations occurred. Neo-natal mortality was generally increasing until 1942-43, although the increase was comparatively slight—from 30.8 to 37.1 deaths per one thousand live births. Since 1942-43 neo-natal, like post-natal mortality, has been falling; in each the rate of fall has been approximately the same. It is concluded that that part of infant mortality, which has elsewhere been shown to be most closely associated with environmental conditions, has fallen over the whole twenty-six years, whereas the decline in neo-natal mortality, shown elsewhere to be associated with the stillbirth rate, is of more recent inception. In view of this, it would be interesting

TABLE I

NORTHERN IRELAND—INFANT MORTALITY BY AGE, 1922-47

PERIOD	AGE AT DEATH							TOTAL
	Under 1 day	1-7 days	1-4 weeks	1-months	2-months	3-months	6-months	
	DEATHS PER 1,000 LIVE BIRTHS							
1922-23		30.8		9.3	5.8	12.6	18.3	76.8
1924-25		31.6		9.2	6.4	14.7	23.6	85.5
1926-27		32.2		9.2	6.5	12.5	21.0	81.4
1928-29		30.5		8.8	5.8	13.8	22.7	81.7
1930-31	9.7	10.5	11.0	6.4	4.8	11.9	16.3	70.6
1932-33	10.6	12.0	12.1	8.7	5.3	13.9	18.8	81.4
1934-35	11.9	11.4	10.9	7.9	5.2	13.4	17.0	77.9
1936-37	11.7	12.2	12.1	7.9	6.5	12.8	14.0	77.2
1938-39	11.3	12.4	9.6	7.2	5.7	12.1	14.6	72.9
1940-41	10.7	11.7	11.8	9.5	6.9	14.9	15.6	81.1
1942-43	9.1	12.5	15.5	8.4	6.7	13.7	11.4	77.3
1944-45	10.1	11.4	12.5	7.9	4.9	11.5	9.5	67.7
1946-47	9.6	9.7	5.8	5.6	4.8	9.9	8.0	53.5
	RATES IN EACH PERIOD EXPRESSED AS PERCENTAGES OF THE CORRESPONDING RATES IN PERIOD 1930-31							
1922-23				145	121	106	112	109
1924-25				144	133	124	145	121
1926-27				144	135	105	129	115
1928-29				138	121	116	139	116
1930-31	100	100	100	100	100	100	100	100
1932-33	109	114	110	136	110	117	115	115
1934-35	123	109	99	123	108	113	104	110
1936-37	120	116	110	123	135	108	86	109
1938-39	117	118	87	112	119	102	90	103
1940-41	110	111	107	148	143	125	96	115
1942-43	93	119	141	131	140	115	70	109
1944-45	104	109	114	123	102	97	58	96
1946-47	99	92	53	92	100	83	49	76

to speculate upon the trend of the stillbirth rate in Northern Ireland—unfortunately stillbirths are not registered in the Province.

Returning to Table I, the decrease in neo-natal mortality since 1942-43 has not been uniform throughout the first four weeks of life. The recorded improvement in neo-natal mortality since the period 1942-43 was, in fact, largely due to an improvement in the rates for the second, third, and fourth weeks of life only. For example, between 1944-45 and 1946-47, mortality in that age period fell from

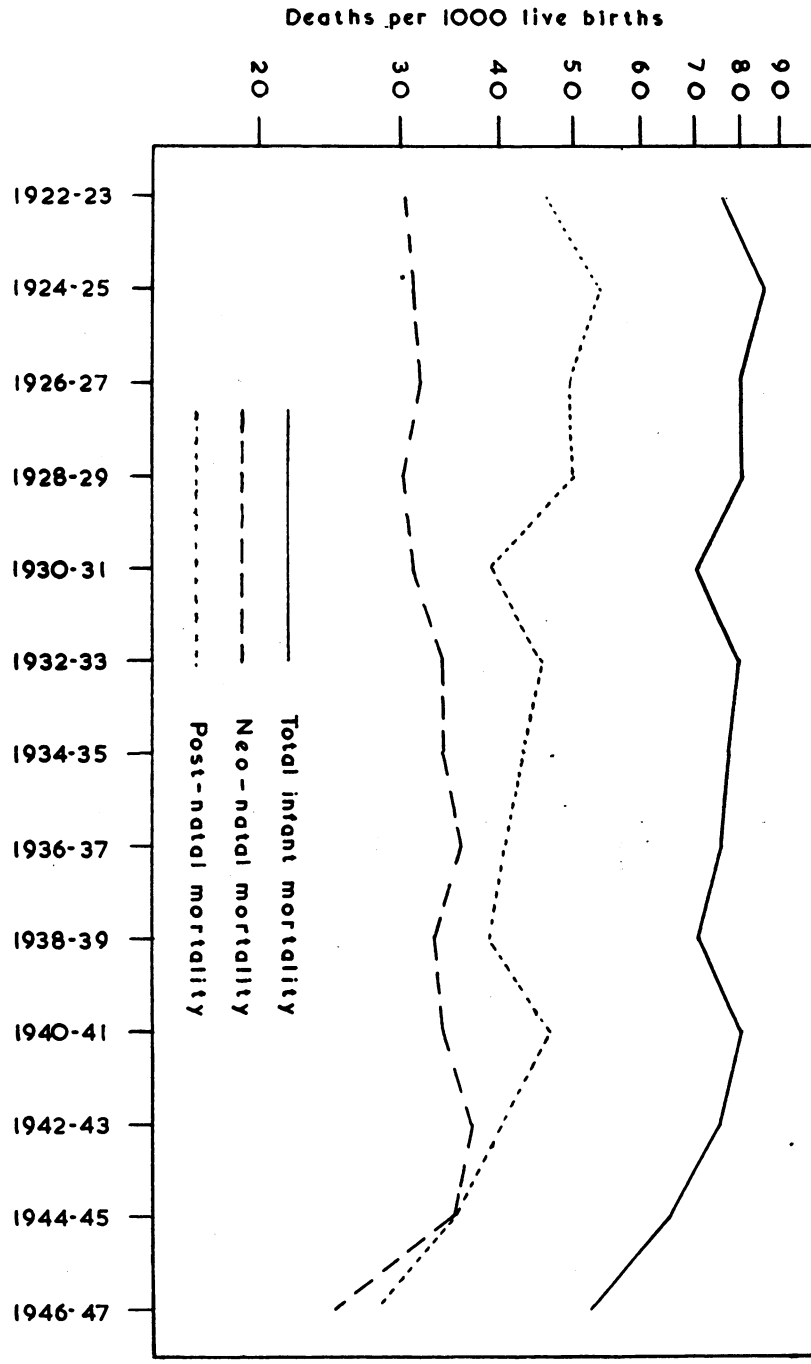

Fig.II Northern Ireland neo-natal and post-natal mortality 1922-47

114 per cent. of its 1930-31 level to 53 per cent. of the same level. In contrast, in terms of the 1930-31 level, mortality in the first day of life fell from 104 to 99 per cent., and in the remainder of the first week from 109 to 92 per cent. In other words, mortality during the first week of life is only slightly less now than it was almost twenty years ago, whereas in the remainder of the neo-natal period mortality has fallen by about 50 per cent.

One might be tempted, from the figures in the table, to over-emphasize the decline in mortality in the one to four weeks age period, by arguing that in 1942-43 the mortality was as high as 141 per cent. of its 1930-31 level, and that during the subsequent six years it fell to 53 per cent. of that level. However, the rates shown for the period 1942-43 are somewhat abnormal in this age group (and possibly in the age groups covering the second and third months of life), since in 1943 there was an unusually heavy mortality from diarrhœa and enteritis among children of these ages.

The steady decline in post-natal mortality over the twenty-six years is largely due to the very striking reduction in mortality which took place in the second six months of life. Since 1936-37 the rate in this age period has never exceeded that recorded for the period 1930-31 and the decline has been continuous since 1940-41. The decline in mortality in the other tabulated age periods after the first month of life has also been fairly continuous since 1940-41, and it is interesting to compare the relative decline in those separate age periods since that date :—

NORTHERN IRELAND

Infant mortality in 1946-47 as a percentage of the corresponding rate in 1940-41

Age Period	Percentage
1—2 months	59
2—3 months	70
3—6 months	66
6—12 months	51

Thus, although in terms of the total infant mortality it would appear that mortality began to decline fairly recently in Northern Ireland, an analysis of the trends of infant mortality in smaller age groups suggests that this late onset of decline has arisen because neo-natal and post-natal mortality tended to balance each other until about 1940. Thus, although the latter has been falling for some time (particularly in the age group six to twelve months), neo-natal mortality (particularly in the first week of life) has been slowly increasing until the early forties; subsequently, both component rates have been falling, with the resultant dramatic decline in the total infant mortality rate of the Province since the beginning of the present decade.

INFANT MORTALITY AND TYPE OF DISTRICT

As may be expected, large regional differences occur in the infant mortality levels within countries composed of many contrasting environments—a situation which arises in part from the association already mentioned between environment

and mortality in the post-natal period. Thus the average infant mortality rates in England and Wales in the periods 1939-41 and 1945-46 for different types of districts were :—

ENGLAND AND WALES

Infant mortality by type of district

Type of District	Deaths under one year per 1,000 live births 1939-41	1945-46
Greater London	43.8	35.9
Aggregate of County Boroughs outside Greater London	64.6	51.1
Aggregate of Urban Districts outside Greater London	54.6	43.2
Aggregate of Rural Districts	50.9	39.1
All Areas	55.2	43.6

Excluding Greater London, mortality was at a minimum in rural areas and at a maximum in county boroughs, which is highly suggestive of an adverse effect on mortality by increased urbanisation—a suggestion which is compatible with observation, since the density of population in town life has been shown to be associated with high post-natal mortality. The low mortality levels reported for Greater London are interesting, and on this subject the Registrar General for England and Wales (1947) wrote :—"The remarkable fall in the Greater London rates at ages between one and twelve months which occurred in 1939 may have been helped to some extent by selective evacuation of delicate infants in the latter part of the year and the special measures for the care of all infants during that period." However, for many years previously, the rates recorded for London compared very favourably with those elsewhere in England and Wales.

It has been estimated that the average annual rate of decrease in infant mortality in rural districts of England and Wales during the present century was of the order of 2.26 per cent. (Martin, 1949), whereas mortality in the aggregate of the county boroughs, London, and the aggregate of the urban districts all declined more rapidly; the average rates of decline in each case were very similar —2.44, 2.47, and 2.49 per cent. respectively. Approximately half the population of Northern Ireland live in rural areas (47.1 per cent. at the 1937 Census of Population [Registrar General for Northern Ireland, 1947]), and it is, therefore, interesting to trace the pattern of infant mortality in the Province in different types of districts.

The infant mortality rates for the County Borough of Belfast, the aggregate of other urban districts, and the aggregate of rural districts are shown in Table II for twelve two-year periods, 1924-25 to 1946-47. Unfortunately, sub-division by this classification is not possible from the published figures of the years 1922 and 1923. Londonderry County Borough has been combined with the aggregate of "other urban districts" in this analysis, since its size is more comparable with that of a large municipal borough than with Belfast, where approximately a third of the total population of the Province reside (Registrar General for Northern Ireland, 1947). The results of the analysis are shown diagramatically in figure III.

TABLE II

NORTHERN IRELAND—INFANT MORTALITY BY TYPE OF DISTRICT, 1924-47

PERIOD	DEATHS AT AGES UNDER ONE YEAR PER 1,000 LIVE BIRTHS			RATES IN EACH PERIOD EXPRESSED AS PERCENTAGES OF THE CORRESPONDING RATES IN THE PERIOD 1930-31		
	Belfast County Borough	Aggregate of Other Urban Districts	Aggregate of Rural Districts	Belfast County Borough	Aggregate of Other Urban Districts	Aggregate of Rural Districts
1924-25	104.9	95.1	65.3	124	131	113
1926-27	105.3	81.3	62.0	125	112	107
1928-29	105.9	82.9	61.9	125	114	107
1930-31	84.6	72.7	57.9	100	100	100
1932-33	105.4	79.5	63.2	125	109	109
1934-35	96.2	82.9	60.6	114	114	105
1936-37	97.5	72.3	62.8	115	100	108
1938-39	90.7	71.3	59.2	107	98	102
1940-41	106.7	78.8	64.2	126	108	111
1942-43	101.8	74.6	60.8	120	103	105
1944-45	86.4	65.0	55.0	102	89	95
1946-47	60.6	53.6	48.2	72	74	83

As in England and Wales, the urban areas had consistently higher infant mortality rates than the rural areas. The rates recorded for the County Borough of Belfast were at a maximum throughout the whole twenty-four-year period. All three types of area experienced the remarkable decline in mortality which has occurred during the present decade. This decrease has been relatively greatest in Belfast and least in the rural districts. In the period 1940-41 the rate for Belfast was as high as 126 per cent. of its 1930-31 level, but by 1946-47 the rate had fallen to a level equivalent to only 72 per cent. of that in 1930-31. At the other end of the scale, in the period 1940-41, the rural rate was only 111 per cent., and by 1946-47 had only fallen to 83 per cent. of its 1930-31 level.

In general, it appears that the rural rates have varied only slightly over the whole period compared with the much wider fluctuations observed in urban areas, and the more rapid decline of the urban rates, compared with the rural rates, follows the experience observed in England and Wales.

INFANT MORTALITY AND CAUSE OF DEATH

A classification of mortality by cause of death presents several difficulties, but at no age period is the problem so complex as it is in early infancy. Even when post-mortem examination has been performed, the complexity of infant pathology still makes the diagnosis of cause of death uncertain in some instances. Since the majority of assessments are based, not upon autopsy findings, but upon clinical

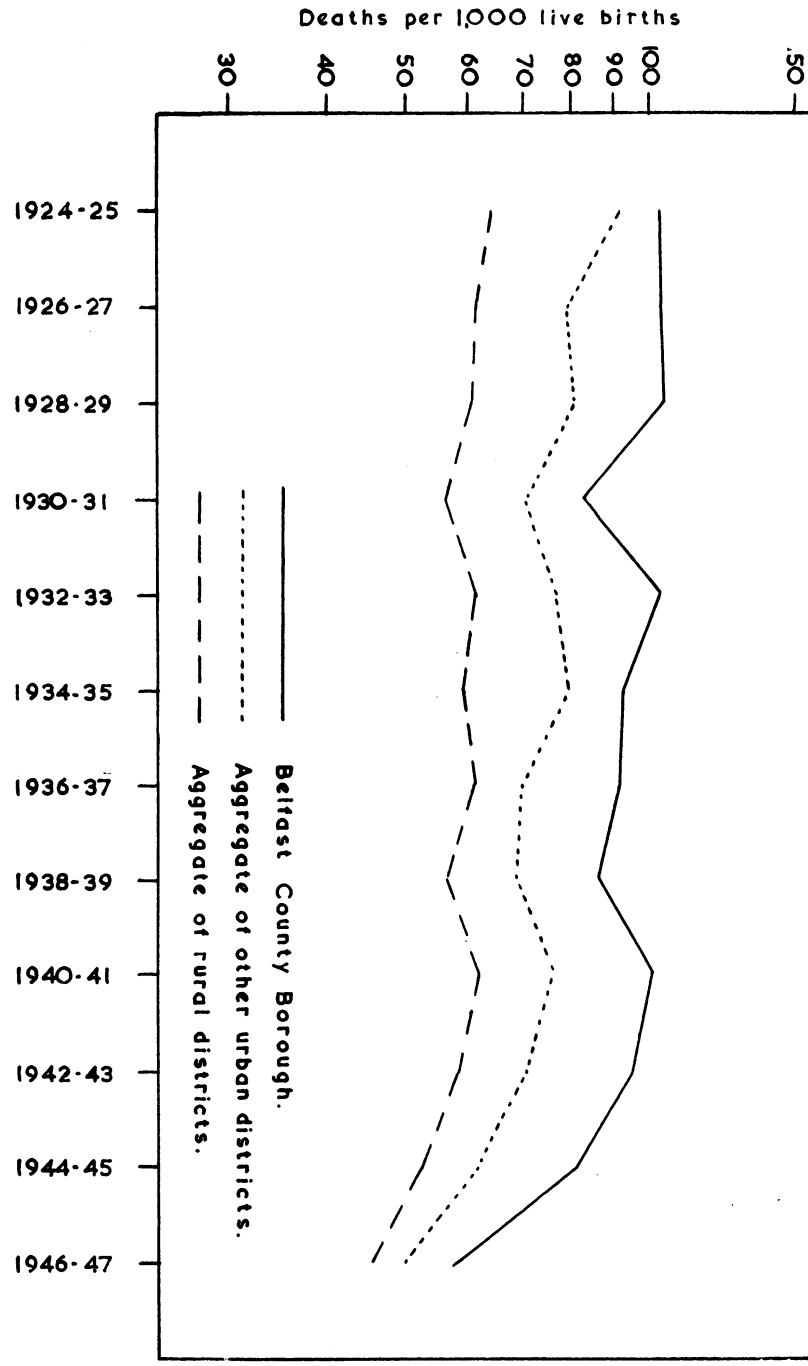

Fig. III Northern Ireland Infant mortality by types of area.

examination, it follows that the allocation of a death to a specific cause group is frequently difficult. Primarily, it is the decisions of pathologists and physicians which form the crude data for any statistical analysis of the mass aspects of mortality in terms of cause of death; any attempt to trace the trend of mortality from one specific cause over a long period is thus bound to be confused by changes in medical knowledge, practice, and skill during the period of review.

In addition to these difficulties, a further complication arises from administrative changes in the methods of allocating and classifying causes of death, as certified on death certificates, to cause groups for official publication. Between 1922 and 1947 two revisions were made in the "International List of Causes of Death." Probably the most important effect of these in relation to the present study is that, with effect from 1940, it was agreed, with minor exceptions, to adopt the certifying practitioner's choice of cause of death for the purpose of allocating deaths to cause groups in the returns of the Registrar General for Northern Ireland. Hitherto, a definite set of rules of procedure had been in use for the selection of one tabulated cause of death from the several causes entered on the medical certificate.

It is to be expected, therefore, that over the whole period of the present review, 1922-47, the mortality rates obtained from the official figures for any one cause of death may not always be strictly comparable from year to year. Thus, deaths which some years ago might have been allocated to one cause of death group will now be attributed to another, either because of more precise diagnosis, or because of a change in the method of selecting the "principal cause" of death in the Registrar General's Department. In spite of this, an examination of the trends of mortality from the more important causes of death amongst infants has been made, but only tentative conclusions have been drawn. Table III shows the appropriate infant mortality rates and the comparative percentages as before.

At the beginning of the period, numerically the most important registered cause of death was "congenital debility." The rate attributed to this "cause" has declined rapidly and continuously, so that in 1946-47 the rate was only 33 per cent. of that in 1930-31. This decline is almost certainly due to the improvement in certification over the past twenty-six years and reflects the gradual elimination of such general descriptions from infant death certificates. As a consequence, the mortality rates obtained for other cause groups include, to a relatively increasing degree, the deaths which would earlier have been described as "congenital debility."

Of the remaining tabulated causes of death, mortality at the end of the period was generally lower than at the beginning in the case of measles, whooping cough, all forms of tuberculosis, bronchitis, and diseases of the nervous system. Possibly in the case of measles, and more certainly in the case of bronchitis and diseases of the nervous system, the fall in mortality has been fairly continuous over the whole period. The fall in bronchitis mortality, from about 5 or 6 per thousand to about 1 per thousand, probably overstates the actual decline. The distinction

TABLE III

Period	Cause of Death: Premature Birth and Injury at Birth	Congenital Malformations	Congenital Debility	Diseases of the Nervous System	Violence	Measles
					Deaths under One Year	
1922-23	11.0	2.9	19.0	5.2	0.7	1.1
1924-25	11.9	3.2	20.7	5.4	0.7	1.8
1926-27	12.9	3.8	17.5	5.1	0.7	1.4
1928-29	13.7	3.9	16.2	5.0	0.4	1.9
1930-31	13.5	4.7	13.4	5.5	0.9	1.4
1932-33	16.4	3.9	14.0	5.1	1.1	1.0
1934-35	17.6	5.5	11.6	4.8	1.5	2.8
1936-37	19.4	5.8	11.3	4.1	1.1	0.2
1938-39	16.8	6.7	10.0	4.5	1.3	1.8
1940-41	18.7	6.9	11.2	3.7	1.5	1.1
1942-43	18.4	7.1	10.0	3.8	1.1	0.5
1944-45	16.6	6.2	6.8	3.1	1.0	0.3
1946-47	14.0	5.2	4.4	2.0	0.8	0.3
			Rates in each Period expressed as a Percentage			
1922-23	81	62	142	95	78	79
1924-25	88	68	154	98	78	129
1926-27	96	81	131	93	78	100
1928-29	101	83	121	91	44	136
1930-31	100	100	100	100	100	100
1932-33	121	83	104	93	122	71
1934-35	130	117	87	87	167	200
1936-37	144	123	84	75	122	14
1938-39	124	143	75	82	144	129
1940-41	139	147	84	67	167	79
1942-43	136	151	75	69	122	36
1944-45	123	132	51	56	111	21
1946-47	104	111	33	36	89	21

between bronchitis and pneumonia in young infants is not always easily made, and from the aspect of this study it is probably more reasonable to regard bronchitis and pneumonia as one complete cause of death group. If this is done, the result is again a decline in mortality, but one which is by no means regular over the period and by no means so great. From the two diseases combined, a rate of 17.1 deaths per one thousand live births was observed as recently as 1942-43, and this level was only exceeded once, in 1928-29, in the period reviewed. Ignoring these abnormalities, the impression remains that mortality from "pneumonia and

NORTHERN IRELAND—INFANT MORTALITY BY REGISTERED CAUSE OF DEATH, 1922-47

CAUSE OF DEATH						
Whooping-Cough	Diarrhœa and Enteritis	Tuberculosis all Forms	Bronchitis	Pneumonia	Other Causes	Total
PER 1,000 LIVE BIRTHS						
4.2	7.2	1.5	4.8	9.4	9.7	76.8
4.8	9.3	1.7	6.0	11.1	8.8	85.5
3.1	12.3	1.6	4.7	10.0	8.4	81.4
3.8	8.9	1.3	5.4	12.2	8.9	81.7
2.4	7.2	1.3	3.3	8.9	8.0	70.6
4.1	10.7	1.3	3.0	12.0	8.7	81.4
1.8	9.9	1.1	2.9	10.1	8.3	77.9
3.1	10.2	0.8	2.4	9.7	9.1	77.2
1.9	8.7	0.9	2.1	9.5	8.6	72.9
2.5	12.5	1.3	2.5	9.8	9.3	81.1
1.8	11.0	1.4	5.1	12.0	8.2	77.3
1.8	9.9	1.2	0.9	10.4	9.7	67.7
1.7	6.2	0.9	0.8	9.6	7.5	53.5
OF THOSE IN THE PERIOD 1930-31						
175	100	115	145	106	121	109
200	129	131	182	125	110	121
129	171	123	142	112	105	115
158	124	100	164	137	111	116
100	100	100	100	100	100	100
171	149	100	91	135	109	115
75	138	85	88	113	104	110
129	142	62	73	109	114	109
79	121	69	64	107	108	103
104	174	100	76	110	116	115
75	153	108	64	135	103	109
75	138	92	27	117	121	96
71	86	69	24	108	94	76

bronchitis" has fallen from about 14 or 15 deaths per thousand in the early twenties, to about 10 or 11 per thousand at the present time.

Although the mortality rates for violence and diarrhœa and enteritis were lower in 1946-47 than at the beginning of the reviewed period, the decrease is of recent onset. In the last two decades a rate lower than that in 1930-31 was not recorded until 1946-47. Mortality from violence between 1922 and 1927 was fairly constant, but, after a slight fall in the fourth period, the rate fluctuated between 0.9 and 1.5 deaths per one thousand live births until 1944-45. Diarrhœa and enteritis never

fell below 6 deaths per one thousand live births, while in five of the two-year periods a rate of more than 10 per thousand was reported.

The trend of mortality ascribed to premature birth and injury is of considerable interest in its relation to neo-natal mortality. In the period 1922-23 the mortality rate from these two causes combined was 11.0 deaths per one thousand live births; twenty-five years later it was 14.0 per one thousand. In the intervening period the rate increased to a maximum of 19.4 deaths per one thousand live births in 1936-37, and during the next four two-year periods it fluctuated between 16.6 and 18.7 per thousand. Like the neo-natal mortality rate from all causes, mortality from premature birth and injury at birth combined has been declining since 1940-41. Part of this decline may be due to an overstatement of the prematurity mortality rate prior to 1940. Before that year "premature birth" occupied a fairly high position in the order of preference for selecting the published cause of death from certificates, whereas after 1940 the certifier's preference of principal cause of death was normally accepted.

Mortality attributed to congenital malformations presents a somewhat similar picture to that of premature birth and injury at birth, and, although the mortality is of less absolute importance, the relative trend of mortality from this cause has varied more strikingly. Congenital malformations were responsible for a mortality rate of 2.9 deaths per one thousand live births in 1922-23, but the rate increased fairly steadily until 1942-43, when a mortality of 7.1 deaths per one thousand live births was recorded—a level nearly two and a half times as great as the initial rate. Since 1942-43 there has been a slow fall in mortality registered as due to congenital malformations, and the rate in the last period was 5.2 deaths per one thousand live births—a level rather less than twice what it was twenty-five years ago.

In spite of the difficulties of making an adequate comparison over so long a period already mentioned, it is felt that these trends do present some interesting facts, and that they are not at variance with the results which would be expected from the more certain analysis by age.

Summary

1. A statistical examination has been made of the published data concerning the trend of infant mortality in Northern Ireland during the twenty-six years 1922 to 1947.
2. Infant mortality in Northern Ireland started to decline rapidly at the beginning of the present decade, having been fairly constant between the years 1922 to 1940. It this respect, the trend of mortality differs from that observed in the rest of the United Kingdom, where the rate has been falling over the whole period under review.
3. The trend of infant mortality in the Province has not been uniform at all periods of the first year of life. Mortality in the last six months of the first year of life in particular, and, as a result, post-natal mortality in general, has

been falling throughout the whole twenty-six years. Until 1940 this decline was approximately balanced by an increasing neo-natal mortality, largely due to the experience of infants in the first week of life. Since 1940 neo-natal mortality has also been falling, although in the first week of life the fall has been only slight.

4. Throughout the period the infant mortality rate in Belfast County Borough has been higher than that in other urban districts taken as an aggregate; the rates observed for the latter have, in turn, been consistently higher than those recorded for the aggregate of rural districts.
5. Since 1940 the decline in infant mortality has been fastest in the County Borough of Belfast and slowest in the aggregate of rural districts.
6. An analysis of cause of death, as registered and tabulated, has been made, and, although conclusions based on the trends of such statistics are bound to be tentative, evidence does emerge that the registered causes of death associated with neo-natal mortality (e.g., premature birth, injury at birth, and congenital malformations) were responsible for an increasing mortality rate up to the beginning of the present decade. Since then a slow fall in mortality has occurred in these causes of death.
7. With the exception of the foregoing and of diarrhœea and enteritis, violence, and possibly pneumonia, a fairly steady decline in mortality from other causes has been observed. In some cases, e.g., diseases of the nervous system and possibly bronchitis, the decline has been more dramatic than in others.

Acknowledgements

I am indebted to Mr. W. A. Carson, the Registrar General for Northern Ireland, for a preview of the relevant figures now published in his Annual Report for 1947; to my colleague Mr. J. D. Merrett, for his assistance with the arithmetic; and to Mr. C. G. A. Bailie, for drawing the figures.

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Two Birthdays a Hundred Years Ago

By Professor W. W. D. Thomson, D.L., M.D., F.R.C.P.

A Speech to the Toast of the Association of Physicians, at its Annual Dinner, Belfast, 3rd June, 1949

As President, it is my great privilege and honour to propose the toast of the Association of Physicians of Great Britain and Ireland.

The Association has only once previously met in Belfast; in 1927, twenty-two years ago to this very day (3rd June, 1949).

The dinner on that occasion, presided over by the late Professor James A. Lindsay, a great clinical teacher, philosopher and classic, was rendered memorable by a presentation to Sir William Hale White, who had held the office of treasurer for twenty years, indeed from the first meeting in 1907.

The passing of Sir William in February last, full of years and honours, brought a very real sense of personal loss to our older members.

He had had a large share in the founding of this Association. The story is recorded in his own words in the memorial volume to Sir William Osler : "Many years ago, Kanthack, Garrod, and I considered the publication of papers, which, although of interest to those working at the scientific aspect of medicine, did not appeal to the majority of those in practice. The untimely death of Kanthack put an end to our plan, but when Osler became Regius Professor at Oxford the two of us left asked his help to revive it. He threw himself into the matter with enthusiasm and suggested that at the same time an Association of Physicians should be formed."

I remember the delight with which Sir William visited the Giant's Causeway on the Sunday following the meeting and recalled, but only to refute, the saying of the great Samuel Johnson, "The Giant's Causeway is worth seeing, but not worth going to see."

The second meeting in Belfast happily coincides with the hundredth birthday of The Queen's University of Belfast. In this hall, in December, 1849, with great pomp and ceremony, the formal opening of the College took place.

And 1849 witnessed also, on the other side of the Atlantic, the birth of one destined to leave an imperishable impress on Canadian, American, and British medicine, the man whose mind first conceived the foundation of our Association—William Osler.

To-night, for a few minutes, I should like to speak of these two birthdays and of the medical background of a hundred years ago.

Queen Victoria had been eight years on the throne when, in 1845, the Government of Sir Robert Peel established the Queen's University of Ireland, consisting of three constituent colleges, one of which was to be built in or near the town of Belfast.

Belfast was then a pleasant Georgian town of about one hundred thousand

inhabitants, whose business life largely centred in and around the White Linen Hall, already the hub of the linen industry in these isles. The harbour and the great shipbuilding yards were still things of the future.

The site chosen for the new Queen's College was in the unspoilt countryside on the road to Dublin, a pleasant stroll for the citizens on a Sunday afternoon from the centre of the town.

Earlier in the year Queen Victoria had visited the building, accompanied by the Prince Consort. Prince Albert had taken a real interest in the new university scheme, had helped to frame the statutes and had seriously considered the invitation to become its first chancellor.

To-day we criticize the lack of foresight, which only took in eleven acres as a building site, but few could have anticipated the wonderful success which the new college was destined to achieve. An average attendance of two hundred students in the first decade has grown to over twenty-five hundred, which includes about seven hundred medical students.

The outstanding personality amongst the new professors was Thomas Andrews, Professor of Chemistry and Vice-President of the College.

The work on which his reputation mainly rests was concerned with the liquefaction of gases, and he was the first to demonstate the continuity of the liquid and gaseous states. Tradition states that many of his researches were carried out in the quadrangle under the ancient laburnum, whose declining years are receiving careful geriatric attention.

One hundred years ago a new era for medicine had dawned. The first English Public Health Act, 1848, had declared a national assault "on the permanent overhanging mist of infection, the epidemic pestilence, and the abiding host of disease." The fight for better sanitation had at least commenced.

The discovery of anæsthesia opened vast possibilities for surgery. But sepsis must first be overcome. In 1849 the voice of Semmelweiss was raised, proclaiming the nature of and the methods for the prevention of puerperal sepsis, but his was a voice in the wilderness, either unheeded or unbelieved or ridiculed.

Another sixteen years were to elapse before the long battle against sepsis was launched, but already the future leaders of the struggle were in training.

Pasteur, the 27-year-old Professor of Physics at Dijon, was still absorbed by his right and left-handed crystals of tartaric acid, but soon he turned to the problems of fermentation and gave Joseph Lister the clue to the prevention of hospital gangrene and the other fatal sequelæ of surgery, with which, as a student at University College Hospital, he was making his first actual contact.

Clinical medicine was in its heyday. The mantle of Richard Bright had descended on the shoulders of Thomas Addison, who, in 1849, read a paper before the South London Medical Society, in which he described the symptoms and signs of disease of the suprarenal capsules and became the pioneer of endocrinology.

These, too, were the glorious days when the Dublin School reached the summit of its fame in medicine, and Robert James Graves and William Stokes, in the Meath Hospital, introduced clinical teaching at the bedside. Their work, as Osler

later said, "Is full of lessons for those of us who realize that the best life of the teacher is in supervising the personal daily contact of patient with the student in the wards."

Had this Association been in existence and had it been meeting in Belfast one hundred years ago, this chair would probably have been occupied by Henry McCormac, a man of genius neglected by his contemporaries, who preached before his time the doctrine of fresh air and the open window in the treatment of pulmonary tuberculosis. The painting of his famous son, Sir William McCormac, in the scarlet and gold of the robes of President of the Royal College of Surgeons, hangs on yonder wall, and the medical tradition of the family is still actively carried on by two of his grandsons, Professor H. R. Dean of Cambridge and Dr. Henry McCormac of the Middlesex Hospital.

This centenary year of Osler's birth should be remembered gratefully by us at this meeting. My younger narrower path never crossed his older wider orbit, and so I fain could wish that someone, with a close and intimate knowledge of the man, could have recalled his memory for us this evening.

How highly he ranked the work done in connection with medical societies can be realized from this passage from "his account book" :—"Completed to-day ten years in Oxford. Extraordinarily happy years. I have done three useful things or better, helped to : (1) The Association of British Physicians; (2) The Quarterly Journal of Medicine; (3) The Historical Section of the Royal Society of Medicine."

On the other side of the Atlantic the year 1849 recalls the rush of the "forty-niners" to the gold fields of California. But there was no surplus gold to be found in the log parsonage at Bond Head, near the edge of the almost unbroken primeval forest which in those days was Upper Canada, where, on the 12th July, 1849, was born William Osler, the eighth child of the Rev. Featherston Osler and his wife, Ellen.

Mr. Osler had come from Cornwall and settled down as a missionary clergyman in the wilds of Canada twelve years before. The young pair had endured for the first few years a life of actual and almost intolerable hardship, but at the time of which I speak the family was comfortably established at Bond Head, a growing village of some two hundred people. The majority of the more recent colonists were ardent Orangemen from Ulster.

For some years it had been the custom of the Orangemen of the district to gather at Bond Head for their annual celebration of the Battle of the Boyne on the 12th of July, just as they had done in their native Ulster. Adorned with sashes and orange lilies, they marched to Mr. Osler's parsonage, where they were sympathetically and cordially received and speeches were made to the "pious, glorious, and immortal memory" of King William. On their annual visit in 1849 they learnt that a new baby boy had arrived that very day at the parsonage. The Orangemen insisted that he should be called William, despite the original choice of his parents for the names Walter Farquhar. The baby was promptly dubbed the Young Prince of Orange, and William he was duly christened. Cushing narrates that, on his subsequent birthdays, decked out in the appropriate colours of orange and

blue, he was brought out on the parsonage verandah to greet the procession, which the other children came to regard as arranged solely in his honour.

Just as Osler in his lifetime, whether in Montreal, Philadelphia, Baltimore or Oxford, was the teacher, friend, and fellow-student to every earnest seeker after truth in medicine, so to many of my and later generations who were brought up on his original text-book, who have read his monographs, and who have studied and pondered his addresses, he is still the wise friend, the clinical adviser, the unseen consultant and the peacemaker when professional friction arises. His published addresses ensure the persistence of his influence. "He being dead yet speaketh." The essays in "Æquanimitas" should be the "Religio Medici" of every medical student and young doctor.

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REVIEWS

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Having said this, however, one must admit there is a great deal of useful guidance and common-sense in this volume. One must, too, be thankful to the doctor for saying boldly much that needed saying in this country—for drawing attention, for example, to the fact that many marriages fail because the husband has no knowledge of the technique of love-making, or, indeed, any inkling that there is such a thing. The treatment of the subject of masturbation is also thoroughly sensible.

On the whole, in spite of its longueurs, the book may be welcomed. D. B. M. L.

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Some Aspects of Eclampsia

By WILLIAM S. CAMPBELL, B.SC., M.B., B.CH., F.R.C.S.(ENG.), M.R.C.O.G., L.M.(ROTUNDA)

Assistant Obstetric Surgeon, Belfast City Hospital

ECLAMPSIA is a disease of theories and personal prejudices. This communication endeavours to present certain facts emerging from a study of eighty-two consecutive cases at the Jubilee Maternity Hospital in the ten-year period 1939-48. These cases were treated mainly by the original Stroganoff technique, but in the last two years magnesium sulphate, sodium gardenal, and other drugs were also used.

TABLE I

CASES OF ECLAMPSIA, 1939-48

Number of cases	82	
Number of infants born	83	
Maternal deaths	10	12.2 per cent.
Live births	55	66.3 per cent.
Stillbirths	28	33.7 per cent.
Neo-natal deaths	12	14.5 per cent.
Total fœtal mortality	40	48.2 per cent.
Recurrent eclampsia	2	2.4 per cent.
Primigravida	51	62.2 per cent.
Multipara	31	37.8 per cent.
Male infants	36	43.4 per cent.
Female infants	47	56.6 per cent.

Seasonal Incidence—

Winter—23 Spring—20 Summer—20 Autumn—19.

Table I illustrates the general features of the series. It will be noticed that the percentage of primigravidæ was rather less than in most published series, and that the sex of the child had no apparent influence on the incidence of the disease. Neither had the time of year: in fact cases occurred during all the calendar months. One cæsarean section was performed, but this was for pre-eclampsia, and the fits occurred following delivery. Just over 10 per cent. of the births were illegitimate.

Table II shows for comparison figures from several series of cases, published in recent years, from different parts of the world—Ireland, Scotland, America, and New Zealand. Comparison of results is very difficult when it is recognised that cases vary widely in severity as well as type, parity, age, etc. Arnell analysed thirteen thousand cases of eclampsia treated conservatively and found the maternal mortality was 11 per cent.: it may be concluded from this large number of cases

TABLE II

Comparative Series

	No. of Cases	Maternal Deaths No.	Maternal Deaths Per Cent.	Fœtal Deaths Per Cent.	C/S Rate
Jubilee	82	10	12.2	48.2	1.2
Falkiner	93	8	8.6	17.2	17.2
Dewar and Morris I	88	18	20.5	41.5	—
II	44	2	4.5	30.6	6.8
Arnell	142	—	—	24.2	6.3
Huber	51	12	23.5	35.0	—
Mussey	24	3	12.5	46.0	—
Corkill	83	4	4.8	20.5	18.1

that conservative treatment, as at present practised, carries an inevitable mortality in this region. Attention should be paid to Dewar and Morris's two series of cases showing results before and after the introduction of Avertin (Bromethol) treatment. Since the beginning of 1949 this method has been on trial at the Jubilee Hospital, and it is hoped to publish the results later when a sufficient number of cases have been treated. Secondly, attention should be directed to Arnell's series, the largest consecutive series without a death yet published. He advocates no new drugs, but places reliance on minimal sedation to control fits, meticulous attention to detail, and non-interference in the active stage of the disease. Thirdly, a tendency to increase in the cæsarean section rate is to be noticed, particularly in Dublin and New Zealand, without apparent increase in the maternal mortality.

TABLE III

Age Incidence

Age Group	Cases	Prim.	Mult.	Maternal Deaths Per Cent.	Fœtal Deaths Per Cent.
16-19	19	16	3	5.5	42.1
20-29	39	29	10	7.7	46.1
30-39	20	6	14	25.0	60.0
40-45	4	—	4	25.0	50.0

	Maternal Deaths Per Cent.	Fœtal Deaths Per Cent.
Prim.	5.9	49
Mult.	22.6	47

In this table the cases are arranged in age groups, and the well-known fact is apparent that the disease is more common in young primigravidæ. Further, it

will be seen, as in other series, that the maternal mortality is greater with age and multiparity. The fœtal mortality figures also rise somewhat with age.

TABLE IV

DETAILED ANALYSIS OF 62 CASES

TYPES

	Ante-Partum Per Cent.	Intra-Partum Per Cent.	Post-Partum Per Cent.
Jubilee	51.6	32.2	16.2
Davis	54.0	16.0	30.0
Greenhill	50.0	30.0	20.0
Arnell	52.0	21.0	27.0

DEATHS

Maternal	12.5	5.0	10.0
Fœtal	65.6	17.9	25.0

Table IV shows an analysis of the type of eclampsia in sixty-two cases. In the remaining twenty cases sufficient data was not available to include in this and subsequent tables. It will be seen that both fœtal and maternal mortality vary with the type of eclampsia. The maternal mortality in post-partum cases varies considerably in different series. Many writers regard the post-partum type as the least serious, but De Lee and Eden, among others, regard it as having the gravest prognosis. This question of mortality and incidence is of considerable interest in studying the question of terminating a pre-eclamptic or eclamptic pregnancy by cæsarean section. Broadly speaking the fits occur in the first twenty-four hours after parturition, although occasionally they occur later, e.g. on the fifth day in one of our cases. It is hoped to deal further with this question in a future communication.

TABLE V

SEVERE CASES

	No.	Fœtal Deaths	Maternal Deaths
Ante-partum	11	10	4
Intra-partum	6	1	1
Post-partum	3	1	1

Percentage severe cases—32.2

Table V shows the percentage of cases estimated as severe by Dieckmann's criteria. This is not an entirely satisfactory method, as cases classified as severe may recover and as mild die. Further, some of the criteria require time to develop, so that their prognostic value is not great. It is necessary, however, in comparing series of cases to have some means of estimating the potential mortality. Eden gives a mean maternal mortality of 22.5 per cent. in cases of eclampsia, the figure being 30 per cent. in severe cases and 4 per cent. in mild.

TABLE VI

PREVENTION

No. of cases having had ante-natal care—9 or 14.5 per cent.

TYPES

Ante-Partum	Intra-Partum	Post-Partum
3	4	2

No. of cases having first fit after admission to hospital (including 7 of above cases)—23 or 37.1 per cent.

Ante-Partum	Intra-Partum	Post-Partum
7	13	3

	No.	Per Cent.
Maternal Mortality	3	13
Fœtal Mortality	8	35

In considering methods of reducing maternal mortality (and possibly coincidently fœtal mortality), prevention naturally should first be considered, because the occurrence of even one fit renders the prognosis of the toxæmic woman infinitely worse. The prevention of toxæmia of pregnancy by dietetic or other means is not considered here. In theory eclampsia should be always, or nearly always, preventable. In practice this is not so. Table VI shows that nine (14.5 per cent.) of the sixty-two cases had ante-natal care at the Jubilee Ante-Natal Clinic (i.e., they had at least one visit to the clinic one week or more before the eclamptic seizure). Many of the other cases had varying degrees of ante-natal supervision from their own doctors. This failure of ante-natal care to prevent eclampsia is widespread. In Arnell's series 35 per cent. of cases had attended his own clinic; Huber's figure was 33 per cent.; and in the Royal Maternity Hospital, Belfast, during 1932-37, the figure was 23 per cent. To this gloomy picture must be added the fact that twenty-three patients (37 per cent.) had their first fits in hospital. This figure includes seven of the above nine clinic cases. Huber, in his series, found the disease was less severe in his own ante-natal patients, while Green has produced figures from the Woman's Hospital, Melbourne, indicating that the maternal mortality was less in cases where eclampsia occurred after admission to hospital. In our series, however, the maternal mortality of the cases which developed eclampsia after admission to hospital was approximately the same as that of the series as a whole, although the fœtality mortality was somewhat less.

Ante-natal care fails for various reasons, which can conveniently be placed in three groups:—

(i) Fulminant cases which develop between one ante-natal visit and the next. The patient may not report the prodromal symptoms which may, however, occur only a few hours before the seizure. There were no cases of this type in the series under review, but one occurred recently.

(ii) Patients may refuse admission to hospital or may not attend regularly. Two of our ante-natal cases fell into this group.

(iii) The largest group consists of errors of judgment on the part of the obstetrician. By this, gross neglect, such as omitting urine testing, is not

meant; rather a failure to estimate correctly the degree of severity of the disease.

The last group must be considered in further detail, as it is here that most failures occur. Until a specific remedy for toxæmia is found, the only really effective treatment in a severe case is termination of the pregnancy. This may, however, fail to prevent eclampsia for several reasons. Firstly, it may not be performed sufficiently early, as it is difficult in many cases of toxæmia to forecast which will develop eclampsia or will become fulminant; further, it may be delayed in a desire to get a larger baby with a better prospect of survival. This latter argument is usually applied to cases of less than thirty-six weeks duration, but its validity is doubtful. Chesley's figures indicate that the babies' chances of survival in toxæmia are probably not reduced by early induction, while Brash reaches the rather surprising conclusion that in her series the premature "toxæmic" babies did as well as or better than the "normal" prematures. Secondly, the method of induction may not be sufficiently rapid. In our series there were five cases of severe toxæmia, admitted as emergencies, in which sedation and artificial rupture of the membranes were followed by eclampsia. Thence, in general, if labour is likely to be slow in starting or to be prolonged, e.g., occipito-posterior position, "unripe" cervix, etc., cæsarean section should at least be considered. Even this, however, may not prevent the occurrence of post-partum fits. Thirdly, and closely linked with the above, sedation may not be sufficient during or after labour, especially prolonged labour. This is usually a consequence of considering the interests of the child.

TABLE VII

FITS OCCURRING AFTER TREATMENT (41.9 PER CENT.)

Fits	Ante-Partum		Intra-Partum		Post-Partum		Cumulative
	No.	Per Cent.	No.	Per Cent.	No.	Per Cent.	Per Cent.
None	20	62.5	11	55.0	5	50.0	58.1
1	4	12.5	5	25.0	2	20.0	75.8
2	3	9.4	—	—	—	—	80.6
3	1	3.1	1	5.0	2	20.0	87.1
4-5	1	3.1	—	—	—	—	88.7
5-10	—	—	2	10.0	1	10.0	93.2
10+	3	9.4	1	5.0	—	—	100.0

One of the principles of treatment is prompt control of the fits, one of Dieckmann's criteria of severity being where the fits exceed ten in number, it being generally recognised that while a patient may die after a single fit (as in one of our cases), persistence of fits is one of the most serious single signs. In sixty-two cases there were six in which the fits exceeded ten in number, and in three of these (50 per cent.) the mother died. In each of these six cases fits recurred after treatment had been commenced. Table VII shows the percentage of cases (41.9 per cent.) in the series in which fits recurred after treatment and their number. In Arnell's series the fits recurred in 59.9 per cent. and even Stroganoff admits to 32.3 per cent. Using Avertin in forty-four cases Dewar and Morris reported

recurrence of fits in only three cases (6.8 per cent.), and in only one of these was there more than one fit. If these figures are confirmed by other workers, Avertin may well prove to be the best anti-convulsive drug used so far. A further point is brought out by this table, a point stressed by Huber, that there is a small group of cases which do not respond at all to conservative treatment, and in which the prognosis is almost hopeless. This group is probably responsible for the greater part of the mortality of 11 per cent. attached to conservative treatment.

TABLE VIII

FŒTAL MORTALITY

Types	37-40 Weeks		33-36 Weeks		26-32 Weeks	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Ante-Partum -	11	2	11	9	10	10
Intra-Partum -	17	3	3	—	—	—
Post-Partum -	8	—	1	1	1	1
	—	—	—	—	—	—
	36	5	15	10	11	11
Per Cent. Mortality—	13.0		66.7		100.0	
			80.0			

Table VIII deals with fœtal mortality, and shows it depends considerably on the duration of pregnancy as well as, as already pointed out, on the type of eclampsia. Is this due to prematurity alone? Probably it is not, since 80 per cent. of these deaths were stillbirths and not neo-natal deaths. Chesley, in a series of one hundred and sixty-seven cases of eclampsia, also gives a figure of 80 per cent. Intra-uterine asphyxia appears to be the factor, and this appears to be of less importance after the thirty-sixth week.

TABLE IX

FŒTAL MORTALITY

	No.	Deaths
Spontaneous rupture - - -	23	5
Artificial rupture of membranes -	24	14
Intra-uterine death before labour -	5	5

Table IX excludes post-partum cases and shows that fœtal deaths most often followed artificial rupture of the membranes. In this series artificial rupture of the membranes was performed as a routine during the first twenty-four hours, as soon as it was considered that the fits were controlled. Arnell deprecates this practice, and only induces after two or three days or later, and then by repeated medical inductions, if possible.

TABLE X

Cases of A.R.M.

Types	37-40 Weeks A.R.M.'s	37-40 Weeks Fœtal Deaths	28-36 Weeks A.R.M.'s	28-36 Weeks Fœtal Deaths
Ante-Partum	8	2	14	12
Intra-Partum	2	—	—	—

Average Times

Types	37-40 Weeks A.R.M. to Delivery Hours	37-40 Weeks Stroganoff to Delivery Hours	28-36 Weeks A.R.M. to Delivery Hours	28-36 Weeks Stroganoff to Delivery Hours
Ante-Partum	12	17	37	55
Intra-Partum	7	12	—	—

Table X analyses the results of the induction cases. The fœtal deaths largely occurred in cases before the thirty-sixth week and the average induction-delivery interval was longer in the cases of fœtal death. No surviving child was born later than twenty-one hours from the time of induction. Chesley, in his series, found that when delivery is delayed more than three days after the first convulsion, 57.2 per cent. of babies die in utero as against 25.8 per cent. before three days. Hence, it seems that, apart from prematurity, fœtal mortality can be related to the length of time elapsing after the onset of eclampsia (and probably after the onset of the pre-eclampsia) until delivery occurs. Possibly artificial rupture of the membranes may hasten fœtal death if delivery does not rapidly follow. Hence, it would appear that the suggestion by Arnell and others of prolonging an eclamptic pregnancy after the acute episode, with the idea of reducing fœtal mortality from prematurity, is liable, apart from any risk to the mother, to defeat its own ends. This probably also holds, as already pointed out, in severe pre-eclampsia before the thirty-sixth week.

Summary

(i) A series of eighty-two cases of eclampsia is reviewed.

(ii) Attention is particularly directed to factors influencing maternal and fœtal mortality with conservative treatment, the frequent failure of ante-natal care to prevent eclampsia, and the problem of recurrence of fits after treatment has commenced.

My thanks are due to Mr. J. A. Price for access to the case records in this series.

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A Fatal Case of Infectious Mononucleosis with Extensive Zonal Necrosis of the Liver

By NORMAN J. AINLEY, M.B.

Institute of Pathology, The Queen's University, Belfast

IN a lecture delivered at Cologne in 1889 Emil Pfeiffer, a pædiatrician from Vienna, described for the first time a condition characterized by fever, sore throat, and glandular enlargement which pursues a benign course and ends in complete recovery. The clinical features of this disease, now known as infectious mononucleosis or glandular fever, have been described in detail by subsequent observers, especially Tidy (1921, 1934, 1937, and 1948). On account of the mild nature and benign course of the malady, fatal cases are uncommon, and most histological studies have been carried out on excised peripheral lymph nodes. One of the more recent papers is that of Gall and Stout (1940), which includes a review of the literature. During the last two decades autopsies on several fatal cases have been reported. These patients died from neurological complications, hepatitis, ruptured spleen, intercurrent infection or accident. These cases are reviewed by Custer and Smith (1948), who also describe their own series of nine fatal cases. One of these cases is reported in more detail by Allen and Kellner (1947), and a fatal case with neurological complications is described recently by Dolgopol and Husson (1949). In all these descriptions there is infiltration of the interstitial tissues and blood-vessel walls of nearly every organ in the body by lymphocytes and by the cells described by Custer (1948) as atypical lymphocytes or infectious mononucleosis cells. To avoid unnecessary repetition, a detailed account of the lesions in each organ will be omitted as the histological appearances of the organs in this case conform very closely to the descriptions given in the literature. This case is presented because of the occurrence of severe jaundice during the course of the illness and the presence of an extensive zonal necrosis of the liver and severe hæmorrhages.

CASE.

CLINICAL HISTORY.

The patient, J. F. C., a young man aged 23 years, was in good health until ten days before admission to hospital. His first symptom was pain in the back of the neck, accompanied by pyrexia. Three days later he became jaundiced and had bouts of vomiting. The urine was a dark colour. Since the onset of the illness there had been several attacks of epistaxis. Examination two days before admission revealed intense jaundice and a roseolar rash on the trunk and limbs. There was enlargement of the superficial lymph nodes and the spleen. Temperature, 104° F. The urine contained albumin and bile.

HÆMATOLOGICAL FINDINGS

(*Dr. J. T. Lewis*).

W.B.C.	3,500
Polymorphs	26%
Lymphocytes	66%
Monocytes	8%
Paul-Bunnell Test	Strongly positive.

On admission to the Royal Victoria Hospital he was in a moribund condition, shocked and distressed. Deep jaundice was present and a dense roseolar rash on the limbs and trunk. Epistaxis was also present on admission. Enlargement of spleen and lymph nodes. Temperature, 96.8° F.; pulse, 150; respirations, 36.

HÆMATOLOGICAL FINDINGS

(*Dr. M. G. Nelson*)

R.B.C.	1,780,000
W.B.C.	13,450
Hb.	40% (Haldane)
Myelocytes	4%
Neutrophils	19%
Lymphocytes	76%
Monocytes	1%

No nucleated red cells or reticulocytes, poly-chromasia, and anisocytosis.

Van den Berg	4 mg.%
Prothrombin Index	20%
Total Proteins	3.75%
Albumin	1.20 mg.%
Globulin	2.55 mg.%

Paul-Bunnell Test positive, 1-512. The agglutinins are specifically absorbed by ox cells and are therefore those normally found in infectious mononucleosis.

Diagnosis: Infectious mononucleosis with severe liver damage.

The patient died a few hours after admission.

POST-MORTEM.

The examination was performed eight hours after death. The body is that of a young man of average build. There is a moderate degree of jaundice and a few petechial hæmorrhages present on the trunk and limbs. Œdema is absent. The superficial lymph nodes in the neck, axillæ, and groins are enlarged. The peritoneal and pleural cavities contain a small quantity of blood-stained fluid. Some pulmonary œdema and congestion are the only abnormalities in the heart and lungs. The liver weighs $4\frac{3}{4}$ lb. It is a pale, yellowish-brown colour, and feels very soft. The serous surface is quite smooth. On section, the lobular pattern is indistinct and the yellow colour is uniformly present throughout the whole liver. There is no abnormality of the biliary system or the liver vessels. The spleen is 2 lb. in weight. The upper pole is bound to the diaphragm by a few thin fibrous

adhesions. The pulp is a bright red colour and bulges beyond the splenic capsule on section of the organ. The Malpighian bodies can not be distinguished on the cut surface of the spleen. On culture, the spleen is sterile. The kidneys show a few small petechial hæmorrhages beneath the capsule. The remainder of the genito-urinary system does not present any significant abnormality on macroscopic examination. The stomach and œsophagus contain some altered blood. The ileum and the entire colon contain a large recent hæmorrhage. The remainder of the alimentary tract, endocrine organs, and neck organs show no relevant changes on naked-eye examination. The brain is uniformly swollen and pale in colour, but there is no gross lesion present on sectioning the organ.

Histology.

Heart: There is a diffuse infiltration of the subendocardial tissue of the auricle by typical and atypical lymphocytes. The atypical lymphocyte or infectious mononucleosis cell (Custer and Smith, 1948) has an irregularily oval-shaped nucleus, with a distinct nuclear membrane, and contains coarse chromatin particles. The nucleus is surrounded by a thin, but well-defined rim of cytoplasm. A few of these cells are present beneath the endocardium of the ventricle. The valve is free from any cellular infiltration or fibrosis. In the interstitial tissue of both the auricular and ventricular myocardium there are foci of these cells, some of which are related to the blood vessels. The subepicardial tissue contains similar cells arranged in collars around the small vessels. The coronary arteries are normal.

Lungs: There is a little œdema of the subpleural tissue and the interlobular septa. Some of the vessels in these areas are surrounded by cellular collars. The alveolar capillaries are congested, and many alveoli contain red cells and stainable œdema fluid. The bronchial walls are infiltrated by the typical cells. There is no increase in the size of the lymphoid aggregates of the lungs.

Liver: The capsule has a sparse lymphocytic infiltration. There is a very extensive centrilobular necrosis present. Only a few cells around the portal tracts have survived. There is considerable cellular infiltration of the portal tracts. This infiltration consists of both types of lymphocyte and a few polymorphs. The bile ducts and the blood vessels are normal in appearance (Fig. 1).

Spleen: There is a scanty lymphocytic infiltration of the capsule and the trabeculæ. The Malpighian bodies are not enlarged and the germinal centres are inactive. The sinusoids are congested and the medullary tissue is infiltrated with lymphocytic cells. The splenic veins show subendothelial infiltration with similar cells.

Pancreas: Microscopic examination revealed no relevant abnormality.

Kidneys: There is no thickening or cellular infiltration of the renal capsule. The glomeruli and the tubules show no significant change. The small vessels beneath the capsule and in the boundary zone are surrounded by collars of the characteristic cells and there is subendothelial infiltration of the larger veins by similar cells (Fig. 2). The sub-mucosa of the pelvis is diffusely infiltrated by these cells.

Adrenals, bladder and prostate: These organs showed only a minor degree of lymphocytic infiltration.

Œsophagus, stomach and ileum: Apart from some altered blood in the lumen, these organs do not present any significant abnormality.

Peripheral lymph nodes: There is no increase in the number of lymph follicles, but there is a considerable enlargement and activity of the germinal centres. These contain numerous typical cells and are surrounded by a thin and incomplete ring of lymphocytes. The medullary cords, the septa, and capsule are infiltrated with many cells of similar type, and the sinusoids are crammed with these cells (Fig. 3). These changes tend to obscure the glandular architecture (Fig. 4).

Tonsils: The follicles are hyperplastic and the capsule is infiltrated by the typical cells.

Bone Marrow: The vertebral and the costal marrow do not show any specific cellular proliferation or infiltration.

Brain and pituitary: There are a few lymphocytic cells in the meninges. The brain and pituitary do not present any abnormal histological features.

Summary of Post-mortem.

History of hæmatological findings of glandular fever, epistaxis, large intestinal hæmorrhage.

Central zonal necrosis of liver.

Mononuclear infiltration of lymph nodes, portal tracts, and perivascular tissues of lung, heart, kidney.

Pulmonary œdema.

Discussion.

Pfeiffer (1889) does not mention the occurrence of jaundice during the course of infectious mononucleosis, and later accounts, Tidy (1921), contain no reference to this symptom. Martin (1941), in a review of the literature up to 1940, quotes only thirteen cases of glandular fever associated with jaundice, the earliest of which is that of Downey and McKinlay (1923). Martin adds two cases of his own to this list. In the next year Kilham and Steigman (1942) describe the occurrence of jaundice seven times in a series of twenty cases of infectious mononucleosis. Whitby and Britton (1946) believe that jaundice is not uncommon in the course of glandular fever, and Tidy (1948) mentions that the association with jaundice has become more frequent only in the last ten or twelve years. He observed many jaundiced cases during the English epidemic of 1935-36 (Tidy, 1937).

The earlier observers thought that the jaundice was due to the enlarged lymph nodes in the portal fissure pressing on and occluding the bile ducts. Tidy (1947) and Martin (1941). de Vries recognized that jaundice often preceded the glandular enlargement, "forme à début ictérique." Here the jaundice could not be due to glandular enlargement producing biliary obstruction. There must be some other reason for the occurence of the jaundice. Stuart (1934) reports a case in which there was jaundice, a direct bi-phasic Van den Berg reaction and an icterus index of fifty, "indicating a toxic or infectious hepatitis rather than obstruction." In the series of cases observed by Kilham and Steigman (1942) in one instance the jaundice was very severe and appeared on the eleventh day. Biochemical tests indicated impairment of liver function and a punch biopsy was reported as a focal acute

hepatitis, with the maximum change around the portal tracts. This is the first time that parenchymatous changes in the liver have been reported in glandular fever. A further study of liver function tests and biopsy in glandular fever was carried out by Cohn and Lidman (1946) and de Marsh and Alt (1947).

In one series of fifteen consecutive cases of glandular fever without jaundice, they found impairment of liver function in every case and in another consecutive series of nineteen similar cases the liver function tests were abnormal and the degree of dysfunction correlated with the degree of liver damage. They concluded that the jaundice in cases of glandular fever is due to parenchymatous liver changes not unlike those of infective hepatitis, and advise a diet rich in protein and vitamins as part of the treatment of glandular fever. Clinically, it is quite often impossible to distinguish those cases of glandular fever in which jaundice occurs early from cases of infective hepatitis (Tidy, 1948).

In the case presented the jaundice appeared early in the course of the disease and was rapidly progressive. The hæmatological and serological findings are consistent with a diagnosis of glandular fever. Death followed the severe intestinal hæmorrhage, a rare occurrence in glandular fever (Israëls, 1937). The biochemical tests revealed a severe degree of liver damage, which was confirmed at autopsy by the finding of an acute and extensive central zonal necrosis of the liver. In this case the jaundice was due to parenchymatous changes in the liver. The findings in this case, of jaundice, liver dysfunction, and hepatitis, are in agreement with those of the other workers mentioned. It appears that in every case of infectious mononucleuosis there is a varying degree of liver involvement in the form of a hepatitis. In the majority of cases this will only be detected by the biochemical tests of hepatic function, or by liver biopsy, as there will be no clinical jaundice. In a few patients where the liver dysfunction is more marked, jaundice will be present clinically. In the case quoted the liver necrosis was centrilobular in distribution, and it is possible that its extent may have been partly determined by the anæmia produced by the severe recurrent epistaxis and the intestinal hæmorrhage. Central zonal necrosis is also found in cases of infective hepatitis (Hadfield and Garrod, 1947), and at the onset cases of glandular fever with early occurring jaundice are clinically indistinguishable from cases of infective hepatitis. The exact relationship between these two diseases, both believed to be of viral origin, has still to be defined.

Summary.

1. The historical and pathological features of infectious mononucleosis are reviewed.
2. A fatal case of infectious mononucleosis with extensive zonal necrosis of the liver and severe intestinal hæmorrhage is presented.
3. The occurrence of jaundice and parenchymatous liver lesions in infectious mononucleosis is discussed and the literature reviewed.

Acknowledgments.

I wish to thank Dr. J. T. Lewis for permission to publish this case, and Professor J. H. Biggart for assistance in writing the paper.

Mr. D. McA. Mehaffey, A.R.P.S,, was responsible for the photography.

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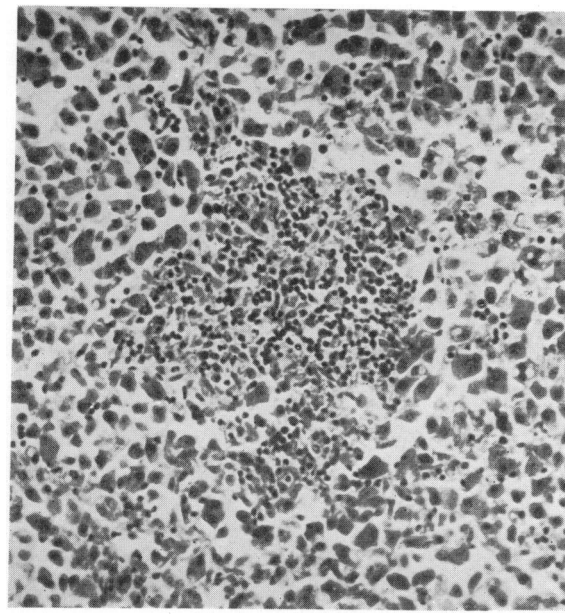

Fig. 1

Liver—Infectious mononucleosis. A portal tract showing infiltration by mononucleosis cells. Some of the surrounding liver cells are necrotic (H. & E. X75).

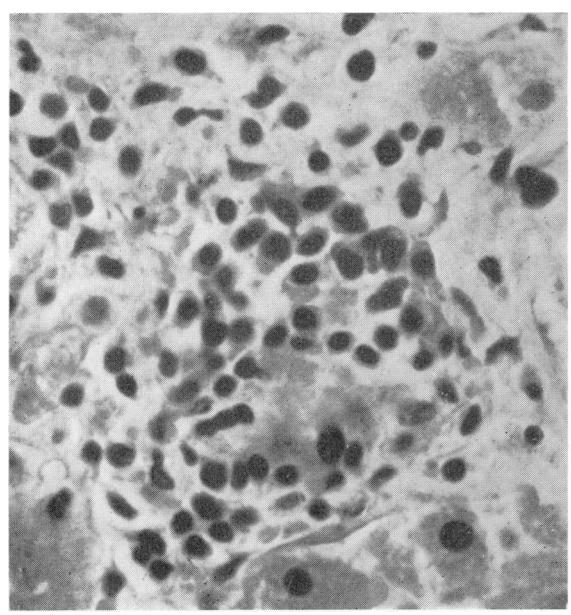

Fig. 2

Kidney—Infectious mononucleosis. A small blood vessel showing the infiltration of the wall by the mononucleosis cells (H. & E. X450).

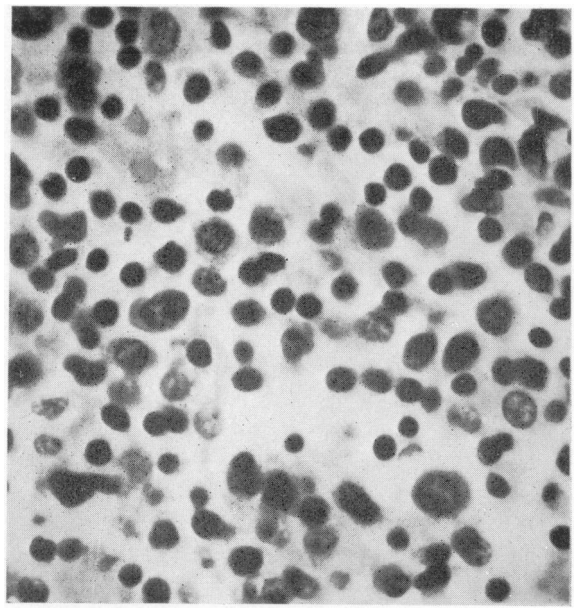

Fig. 3

Lymph Node—Infectious mononucleosis. The sinusoids are filled with the typical cells (H. & E. X450).

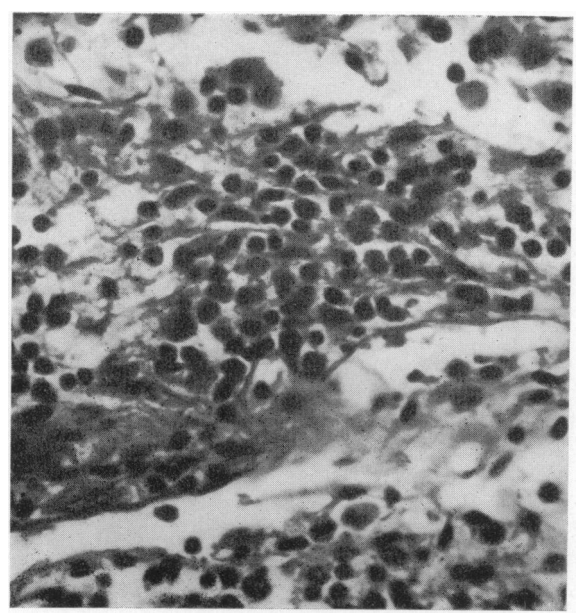

Fig. 4

Lymph Nodes—Infectious mononucleosis. One of the fibrous septa heavily infiltrated by the infectious mononucleosis cells (H. & E. X450).

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MONTHLY OBSTETRIC MEETINGS

A MEETING was held on the 27th April, Professor F. M. B. Allen taking the chair. Dr. D. C. McEwan read a paper entitled "The Method of Delivery following previous Cæsarean Section." He reviewed the method of delivery and the outcome in 228 consecutive cases confined in the Royal Maternity Hospital, Belfast, between January, 1945, and December, 1948. All these cases had been delivered previously by cæsarean section, the lower segment operation having been performed in 90 per cent. of the cases. The dictum "once a section, always a section" was not followed during this period and each case was evaluated individually. Ninety-two suitable cases were permitted a short trial of labour and fifty-six had a successful vaginal delivery. Of forty-one cases having more than one previous section, forty were treated by elective section—in the forty-first case the fœtus died in utero during the thirtieth week and delivery was effected per vias naturales. There were no maternal deaths in the series but rupture of the uterus occurred in four cases, of which two followed the lower segment operation. All these cases were admitted late in labour with evidence of disproportion, three being emergency admissions and the fourth having been booked for elective section. The speaker concluded that a trial of labour was frequently justified following previous section. The most suitable cases were those in which the previous section had been performed for pre-eclamptic toxæmia, placenta prævia, uterine inertia, or borderline disproportion with a larger baby. He stressed, however, that patients must be confined in hospital in all pregnancies which follow a section—in one case in the series delivered by section in the fourth pregnancy was followed by rupture during the seventh confinement.

At a meeting held on the 25th May, 1949, Professor F. M. B. Allen took the chair. Dr. C. G. Irwin described a case which illustrated the difficulties encountered in surgical induction of labour. He considered that the problem of induction varied with the period of gestation. Before the thirtieth week the choice rested between abdominal hysterotomy and slow dilatation of the cervix with laminaria tents. Each case should be considered individually, but, in general, the speaker favoured hysterotomy. From thirty to thirty-six weeks the cervix was hard, tubular, and closed. The introduction of bougies, or, preferably, a soft rubber stomach tube, was indicated, to be followed in forty-eight hours by rupture of the membranes. This method was frequently complicated by delay, uterine inertia, and intrauterine infection. The speaked considered that more of these difficult cases should be delivered by cæsarean section—this rapid method was becoming increasingly safe for mother and child. After thirty-six weeks the cervix was soft, effaced, and partially dilated. Induction by rupture of the membranes was usually successful and section should be reserved for cases with some complicating indication.

At a meeting on 29th June, 1949, Professor C. H. G. Macafee took the chair. Mr. W. S. Campbell presented figures relating to certain aspects of eclampsia at

the Jubilee Maternity Hospital, Belfast, during the ten-year period 1939-48. Eighty-two cases, with a maternal mortality of 12.2 per cent. and a fœtal mortality of 48.2 per cent., were analysed, treatment being mainly by a Stroganoff routine.

Comparative figures from recent published series were shown, and stress laid on the mortality of 11 per cent. with conservative treatment over large numbers of cases. The effects of various factors on prognosis was illustrated, and the relative failure of ante-natal care to prevent eclampsia discussed. The frequent recurrence of fits after treatment had begun was demonstrated, and factors bearing on the fœtal survival rate analysed.

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What more can be added to the universal acclaim with which this work has been greeted since its inception twenty years ago? The list of contributors includes many whose experience and wisdom have gained for them places of renown in their profession. In their writings is reflected that sense of proportion and judgment which is the goal of the student, undergraduate, and postgraduate alike. There is here a readily accessible fund of practical information, the important data being unobscured by the complexities of abstruse detail. J. C. D.

CLINICAL RŒNTGENOLOGY OF THE DIGESTIVE TRACT. By Maurice Feldman, M.D. 3rd Edition. 1948. Pp. ix + 901. Illustrations 641. London: Baillière, Tindall & Cox. 44s.

A THIRD edition of this valuable text-book of radiology of the gastro-intestinal tract is most welcome. The first edition appeared in 1938 and the present edition has been brought up to date by the addition of further information and illustrations. The revision of such a work, already found to be reliable and helpful, is probably of greater value than the publication of a new book.

The book is compiled in a simple and straightforward manner, making casual reference easy and continuous reading a pleasure. A large number of excellent illustrations are included. These are mainly reproductions of actual radiographs, which by a double process have been reproduced as negatives. Writers of text-books of radiology often limit their illustrations to the less expensive and less troublesome single process of printing negative radiographs as positives. This is unsatisfactory, as most readers are accustomed to looking at radiographs as negatives. For this reason the unusually high proportion of negative illustrations is most gratifying.

All sections of the book are good, but two, I think, are outstanding. One is the chapter on The Œsophagus, and with this may be coupled the chapter on Hernia, which deals very adequately with the ever recurring problem of diaphragmatic herniæ. The other section which deserves special comment is that on the Gall-Bladder and Liver. Here is an unusually full account of biliary diseases in their clinico-radiological aspects, and not merely a collection of illustrations of gall stones and still larger gall stones.

The information is right up to date, but the author has used great discretion in the selection of new material.

The book can be recommended with confidence to students or practitioners as a reference work on the radiology of the gastro-intestinal tract. D. C. P.

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A THIRD edition of this valuable text-book of radiology of the gastro-intestinal tract is most welcome. The first edition appeared in 1938 and the present edition has been brought up to date by the addition of further information and illustrations. The revision of such a work, already found to be reliable and helpful, is probably of greater value than the publication of a new book.

The book is compiled in a simple and straightforward manner, making casual reference easy and continuous reading a pleasure. A large number of excellent illustrations are included. These are mainly reproductions of actual radiographs, which by a double process have been reproduced as negatives. Writers of text-books of radiology often limit their illustrations to the less expensive and less troublesome single process of printing negative radiographs as positives. This is unsatisfactory, as most readers are accustomed to looking at radiographs as negatives. For this reason the unusually high proportion of negative illustrations is most gratifying.

All sections of the book are good, but two, I think, are outstanding. One is the chapter on The Œsophagus, and with this may be coupled the chapter on Hernia, which deals very adequately with the ever recurring problem of diaphragmatic herniæ. The other section which deserves special comment is that on the Gall-Bladder and Liver. Here is an unusually full account of biliary diseases in their clinico-radiological aspects, and not merely a collection of illustrations of gall stones and still larger gall stones.

The information is right up to date, but the author has used great discretion in the selection of new material.

The book can be recommended with confidence to students or practitioners as a reference work on the radiology of the gastro-intestinal tract. D. C. P.

the Jubilee Maternity Hospital, Belfast, during the ten-year period 1939-48. Eighty-two cases, with a maternal mortality of 12.2 per cent. and a fœtal mortality of 48.2 per cent., were analysed, treatment being mainly by a Stroganoff routine.

Comparative figures from recent published series were shown, and stress laid on the mortality of 11 per cent. with conservative treatment over large numbers of cases. The effects of various factors on prognosis was illustrated, and the relative failure of ante-natal care to prevent eclampsia discussed. The frequent recurrence of fits after treatment had begun was demonstrated, and factors bearing on the fœtal survival rate analysed.

REVIEWS

TEXTBOOK OF MEDICINE. Edited by Sir John Conybeare, K.B.E., M.C., D.M.(Oxon.), F.R.C.P. Ninth Edition. Edinburgh: E. & S. Livingstone Ltd. 1949. 30s.

THIS most popular work, an old friend on the bookshelves of so many students and doctors, appears in its ninth edition in a becoming new guise. It is well proportioned and easily handled, while its large printing and clear spacing offer the greatest comfort to the reader. The index is complete, thus avoiding those moments of impatient frustrated searching through cross references in order to find, at long last, that one terminology deemed correct by the author where a page number is given.

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MEDICINE: DIAGNOSIS, PREVENTION, AND TREATMENT. Second Volume. By A. E. Clark-Kennedy, M.D., F.R.C.P.

THIS is a most absorbing book; original in its presentation of facts, clever, erudite, and stimulating.

It covers an almost incredible amount of ground and yet never savours of the potted variety of text-book. No aspect of medicine or medical life has been omitted, and the transitions from one subject to another are so easy that, more often than not, one has the feeling of reading a delightful essay. It is more a book for the doctor than for the undergraduate; for the mature mind rather than for the adolescent.

The author has left on every page the imprint of his own personality. He paints a broad canvas with forceful sweeps of his brush and one scarcely remarks the familiar "signs and symptoms" on the web of human life and suffering as he sees and depicts it.

On many small points one may not agree with the author. The late Sir Arthur Hurst (and who was in a better position to know?) would have had kinder things to say of adrenaline. It is not every doctor who would be willing to give mercurial injections in the treatment of chronic renal disease. Most doctors who have used gold salts with discretion in large numbers of suitable cases of rheumatoid arthritis will not share the view that "they seldom lead to any real improvement in these cases." On the other hand, it is a relief to see such a frank scepticism with regard to the evils consequent on "focal sepsis," and his forthright statement that "the less said about high blood pressure the better" is a matter for gratitude.

His style is so fluent, his mastery of language so obvious, that one feels that he might, with advantage, have left "physical guts" and "stay put" to writers of lesser stature.

There is much food for thought in the chapter entitled "The Practice of Medicine," in which the author philosophises on many aspects of man's life in relation to the State, a doctor's in relation to his patients, to moral problems, and finally, his thoughts on old age and death. He has obviously been at some trouble to inform himself of various viewpoints in certain religions, although at times his interpretation of them leaves him open to some criticism, and, furthermore, he speaks of "terminating pregnancy" (given certain indications) as though such a viewpoint was of universal acceptance.

He does well to remind his readers that "This is not the time to hand over the growing power of medicine completely to the State."

Certainly a book to read and to enjoy, although the very tenuous hold on faith that one senses in much of the book may sadden, and rightly so, all those who feel deeply on such matters.

E. M. H.

ILLUSTRATIONS OF SURGICAL TREATMENT. By Eric L. Farquharson, M.D., F.R.C.S.E., F.R.C.S.(Eng.). 3rd Edition. Pp. 391. Edinburgh. E. & S. Livingstone Ltd. 25s.

THIS book is for students preparing for their final examinations and for recently qualified hospital residents.

It is divided into three parts, but, unlike "All Gaul," which Cæsar told us was similarly divided, no part has any connection with the others.

Part One deals with the infusion and transfusion of fluids and blood, is clear, concise, and up to date, and so well illustrated that the whole problem is vividly presented in twenty-six photographs and less than thirty pages.

Part Three is concerned with instruments and appliances and is really a short illustrated catalogue to prepare students for examinations in which their seniors require a knowledge of surgical instruments, their names, and uses.

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of the spine, tennis elbow, congenital dislocation of the hip, tuberculosis of the hip, club foot, flat foot, claw foot, and metatarsalgia. Indeed the subjects above listed are the only orthopædic problems discussed, but, unfortunately, the reader is left with a feeling of incompleteness. For example, congenital dislocation of the hip, surely one of the most difficult of all difficult orthopædic problems, would seem in the majority of cases to be solved by manipulation and the application of a plaster cast in the "frog" position. No other method, except a Putti mattress in the very young, is mentioned.

Again, in "tennis elbow," manipulation is the only method suggested, and in the foot deformities many common and well-known methods of treatment have been passed over.

In the chapters dealing with fractures the author has rightly stressed conservatism, since the readers of this book will be students and house surgeons who will not be called on to operate on those fractures requiring surgical methods for their reduction and treatment. These chapters are, however, a very excellent guide to the hospital resident, and the illustrations are so clear and numerous that the difficulties of plaster technique and splintage must dissolve before his eyes. A most helpful section indeed. Since fractures and their treatment comprise the bulk of the book, the title is misleading, though what title could be applied to the subject matter of infusion and transfusion, fractures and dislocations, and surgical instruments I do not know. R. J. W. W.

MEDULLARY NAILING OF KUNTSCHER. By Lorenz Bohler, M.D. Baillière, Tindall & Cox. 38s. 6d.

To Kuntscher goes the credit for the introduction of intramedullary nailing in the treatment of fractures of long bones. His announcement was made in Germany in 1940 and immediately Dr. Bohler took up the method with energy and enthusiasm.

In this book, translated from the German into English by Hans Tretter of New Jersey, Bohler has written up his experiences with over six hundred cases and, whilst he has nailed all the long bones, it is clear that the greater part of the work has had to do with femoral shaft fractures.

Whilst starting with enthusiasm for the method, he stresses early on in the book (page 8 and in deep print) that medullary nailing is suited chiefly for transverse fractures of the femur in the middle third, whereas in other long bone fractures the method frequently entails more disadvantages than advantages.

The chapter on complications is of extreme interest, peripheral blood changes are described, and sepsis is brought into the open. It is enlightening to read that "the worst complication is death."

The author has shown in many beautifully reproduced figures and X-rays that intramedullary nailing often delays callus formation, or in some cases even completely stops it.

The stressing in almost every chapter that nailing should be omitted in the presence of profound shock seems strange, and one wonders what manner of surgeon the author is addressing when he feels it his duty to emphasise a basic surgical principle long accepted by all.

There is much in the book to admire and much with which one cannot agree, but it should prove of great help to the orthopædic surgeon who has been hesitating about taking up the method. After reading this book the surgeon will be certain to "go slow" in discarding well tried, safe, and conservative methods of fracture treatment for intramedullary nailing methods.

It seems clear that Dr. Bohler himself believes that the method has a small though important place in treatment of long bone fractures, and, reading between the lines, it appears to the reviewer that nailing can, with advantage to the patient, be advised in a small percentage of femoral shaft fractures in the upper and middle thirds of the bone, in ununited fractures of the femur in the same situation, and possibly in certain cases of ununited humeral shaft fractures. For the rest the method has too many disadvantages to displace common orthopædic practice. Most certainly this book should be in every orthopædic and fracture department library, but it will not be of any special service to the general surgeon. R. J. W. W.

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AIDS TO THE NURSING OF VENEREAL DISEASES. By E. M. Ryle-Horwood. Pp. 132. Baillière, Tindall & Cox. 5s.

ALL concerned with the nursing of venereal disease will welcome the publication of this book.

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The wide public health aspects of the venereal disease problem are suitably stressed.

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This is a most comprehensive text-book for the nurse. E. M.

PHARMACOLOGIC PRINCIPLES OF MEDICAL PRACTICE. By J. C. Krantz and C. J. Carr. Pp. xv + 980, with 94 figures. Baillière, Tindall & Cox. 55s.

THIS book belongs to a class well represented in American literature, but with no counterpart of British origin. It is larger than the available books by English authors and more detailed consideration is given to the therapeutic uses of drugs. It is a good book and gives, on the whole, a fair presentation of its subject. The arrangement adopted illustrates the difficulty of devising a logical classification of drugs. They are grouped in relation to their actions on parasites, on systems of the body, and on the metabolism of essential substances. This arrangement has disadvantages. It precludes a connected account of such natural groups as the anterior pituitary hormones. The chapter headed "Dietary Adjuncts" is in the section on the response of the skin and mucous membranes to drugs; it deals with most of the vitamins, protein hydrolysates, and, rather unexpectedly, with liver function tests.

Some matters are open to criticism. The specific depressants of sensory nerve endings are said to "penetrate the cells of the nerve fibrils." The paragraph on acridine derivatives is out of date. Work on ergotamine in 1909 is attributed to Barger and Dale, although ergotamine was not discovered by Stoll until 1918, and Barger and Dale used ergotoxine. (This error may be deliberate, since the two drugs have practically the same actions, and the authors confine their description to ergotamine; but the reader's confidence in their accuracy is somewhat shaken.) The paragraph on incompatibility is devoted mainly to general remarks. A useful, though, of course, incomplete, list of incompatibilities could have been given in the same space. Recent work by British pharmacologists does not receive much attention; older work is more adequately recognised.

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A few Americanisms (such as "repetitious" for "repeated") are redeemed by occasional vivid phrases. Thus, of alcohol :—"It enables one to face life temporarily on a more or less subcortical level."

There are numerous plates from photographs of distinguished American (and one or two other) scientists and there are many good illustrations in the text. The book is well produced, and, in spite of some faults, creates a favourable impression. It can be recommended both to students and to clinicians. E. B. C. M.

PATHOLOGY OF THE NERVOUS SYSTEM: A Student's Introduction. By J. Henry Biggart, C.B.E., M.D., D.Sc., with foreword by Professor A. Murray Drennan, M.D., F.R.C.P.(Ed.), F.R.S.(Ed.). Second Edition. 1949. Pp. 345. 232 illustrations and 10 coloured plates. Edinburgh: E. & S. Livingstone. 21s.

In spite of requests to develop and enlarge the scope of his book, the author has happily preserved the plan of the first edition and it remains an introductory work for the use of students. This does not imply that it is of value only to undergraduates. Far from it. Students of all degrees and ages can peruse it with profit and find much of interest in its pages, for it is not merely a compilation of other workers' views and observations, but is mainly and essentially based on the author's own work. The illustrations are particularly valuable, as rarely can such clear and excellently reproduced half-tone illustrations be seen in the literature of the subject. They are a testimony to the skill of the photographers and the engraver. The colour plates are outstanding.

A world-famous pathologist has stated that Professor Biggart's volume is unsurpassed as one of the shorter treatises on the subject, and with this opinion the reviewer wholeheartedly agrees. This volume would have been welcomed by him in the days when he was first struggling in that, at the time, little-explored field of neuro-pathology. P. A. C.

SYMPTOMS IN DIAGNOSIS. By J. C. Meakins, C.B.E., M.D., D.Sc., LL.D. Pp. 542. Baillière, Tindall & Cox. 22s. 6d.

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In several of the subjects follicular hyperkeratosis was present at the start and varied during the experiment, but the variations bore no relation to the vitamin A intake. Four of the volunteers contracted major illnesses during or after the period of deprivation; these illnesses were impetigo contagiosa, migraine, tuberculous pleurisy, and tuberculous disease of the spine. Whether the dietary deficiency played a part in the ætiology of these illnesses is not certain.

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The figures for supplying the recommended daily amount of vitamin A as carotene in certain foodstuffs are given as the following :—

Carrots, boiled, sliced, or purée - - -	12,000	International	Units	daily.
Carrots, homogenized - - - -	5,500	,,	,,	,,
Cabbage, spinach - - - - -	7,500	,,	,,	,,
B-Carotene in fat - - - - -	4,000	,,	,,	,,

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made to assess the minimal daily requirements of the vitamin for healthy males of 20-30 years of age. This was estimated at 1,300 International Units daily given as pre-formed vitamin A and the recommended daily intake estimated at 2,500 I.U. For carotene, the corresponding estimates were 1,500 and 3,000 I.U., assuming complete availability of the carotene. However, the actual availability of carotene in vegetables varies and is far from complete.

The figures for supplying the recommended daily amount of vitamin A as carotene in certain foodstuffs are given as the following :—

Carrots, boiled, sliced, or purée - - -	12,000	International	Units	daily.
Carrots, homogenized - - - -	5,500	,,	,,	,,
Cabbage, spinach - - - - -	7,500	,,	,,	,,
B-Carotene in fat - - - - -	4,000	,,	,,	,,

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