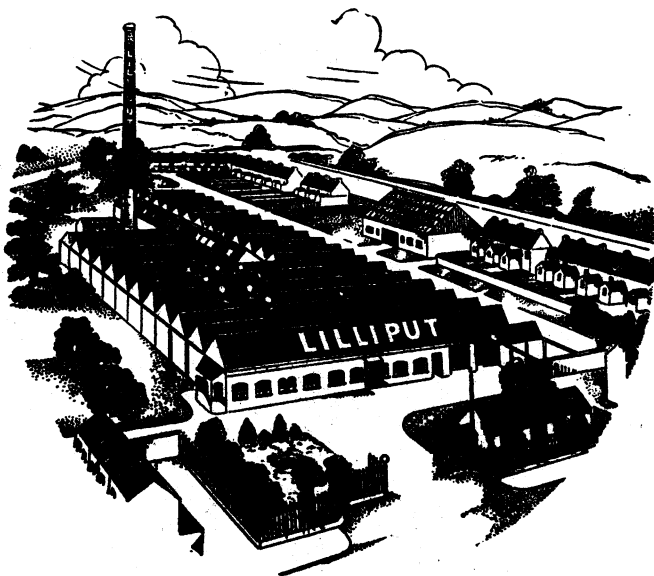


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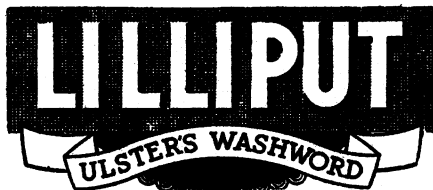


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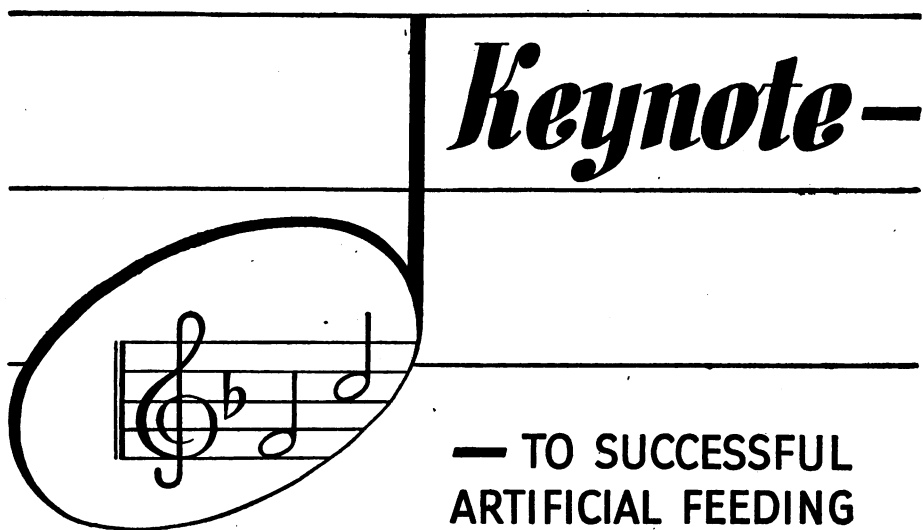
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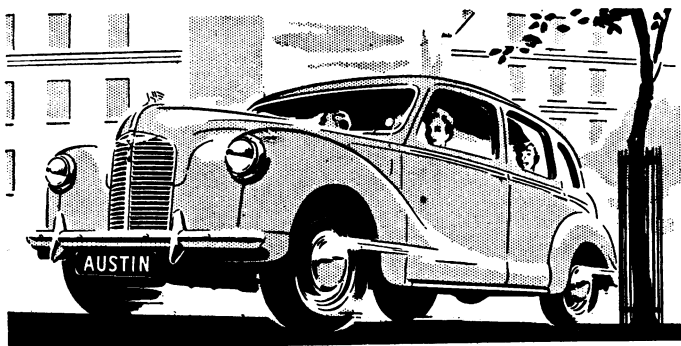
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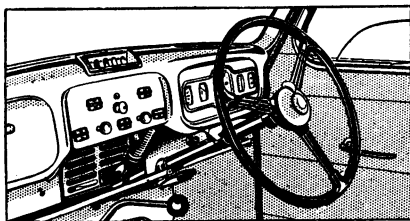
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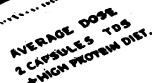
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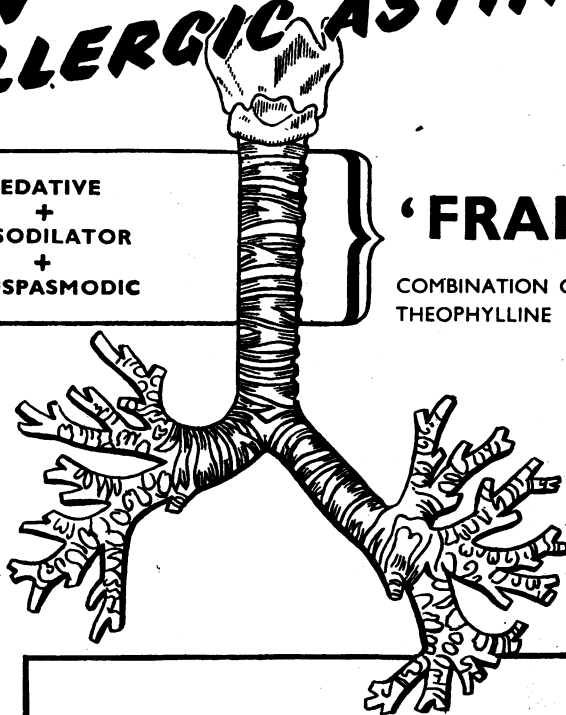
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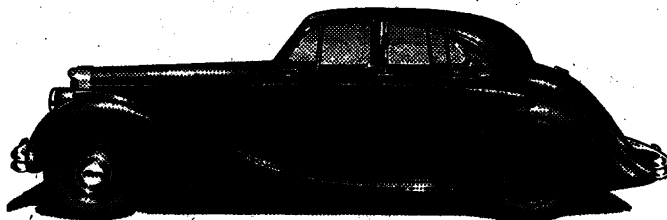
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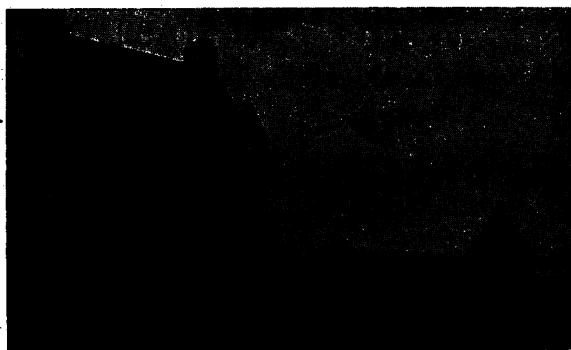
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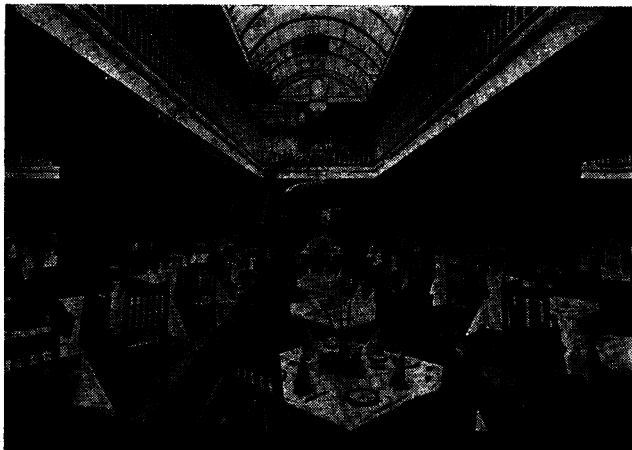
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REVIEWS

AIDS TO EMBRYOLOGY. By J. S. Baxter, M.Sc., M.D., F.R.C.S.I. Fourth Edition. Pp. viii + 181. 45 illustrations. London : Baillière, Tindall & Cox. 1948. 5s.

It is twenty years since this book first appeared, and ten since the third edition, under the editorship of R. H. Hunter, its original author. An attempt has been made in the present edition to incorporate the many advances in our knowledge of human embryology which have been made during the past decade, and the text has been practically completely rewritten. The original lay-out and most of the illustrations, either in their original or in modified form, have been retained, and some new illustrations have been added. The new author has succeeded remarkably well in his attempt, and he has kept the book, which gives an account of the main developmental changes which occur during gestation, a very readable one. It is strange, however, to find no direct mention of organisers, or of inductive phenomena in general. Nor is there mention of the theoretical importance of such concepts which suggest reasons for the occurrence in the ontogeny of a human embryo of the transient embryonic structures, such as the primitive streak, notochord, pro- and meso-nephroi, pharyngeal clefts, etc. Attention is called to the functional activity of the mesonephros in lower mammals until such time as the metanephros is able to function. It might have been added that the degree of activity of the mammalian mesonephros is in some measure related to the types of placentation found in the species concerned. There is occasional unevenness of stressing which could easily mislead the student. The paragraph on the myelination of the tracts in the C.N.S. may be used as an illustration. The paediatrician and the child psychologist, as well as the student, is interested in the times of myelination of the main nerve tracts in the brain and spinal cord, if indeed this process accompanies the acquisition of function. What exactly is meant by "aberrant pyramidal fibres," and why are they singled out along with the obscure olivo-spinal tract, whose exact origin and termination are unknown, for especial mention, when such important tracts as the main cortico-spinal and the spino-cerebellar tracts are omitted? The chapter on the coelomic cavities might also be mentioned as an example. It is much too short,

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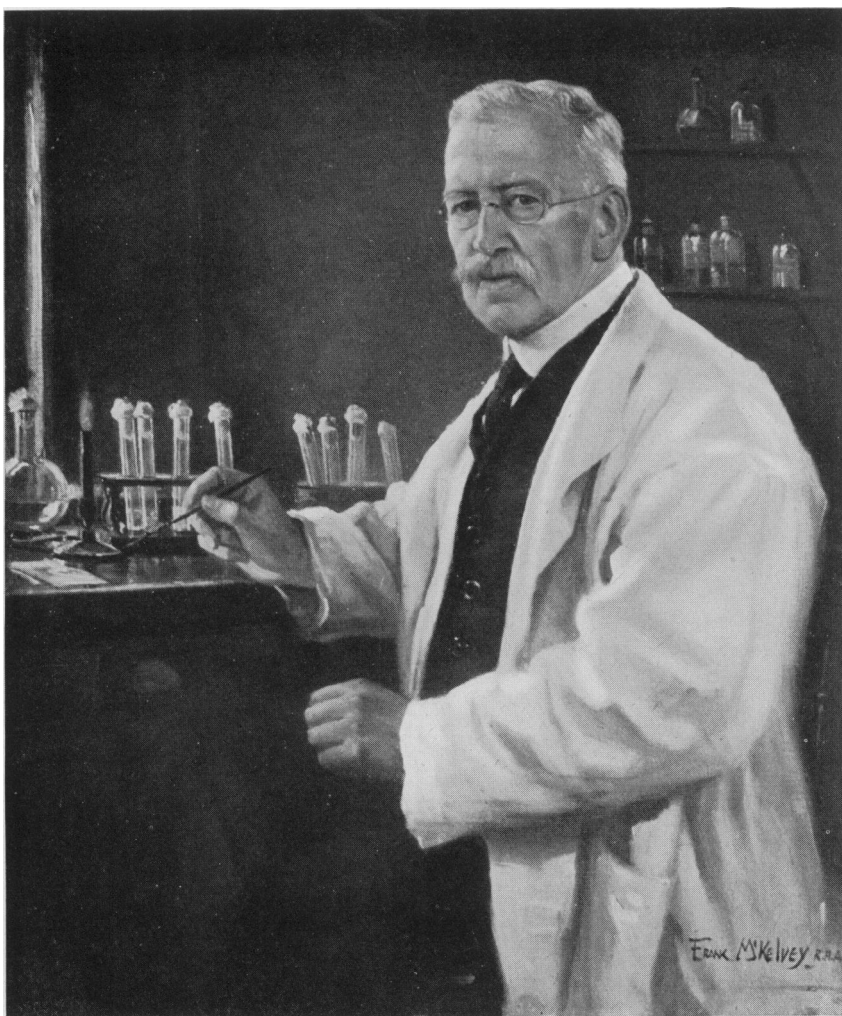
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SIR THOMAS HOUSTON

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SIR THOMAS HOUSTON, O.B.E., B.A., M.D.

ON 14th October, 1948, immediately before the Annual Dinner of the medical staff of the Royal Victoria Hospital, Belfast, Professor W. W. D. Thomson presented, on behalf of the staff, a portrait, by Mr. Frank McKelvey, R.H.A., to Sir Thomas Houston. He said :—

“We, the consultant and visiting staff of the Royal Victoria Hospital, are all very happy and content to welcome Sir Thomas amongst us once again after his severe illness and operation. We all admired the courage and equanimity with which he held his head unbowed during many weary weeks, and the innate obstinacy, so characteristic of a man from the Route, in his determination to get well.

“Some time before Sir Thomas fell into the hands of the physicians and surgeons he had, at the request of his colleagues on the staff, sat for his painting by Mr. Frank McKelvey. We had always intended to present this painting to him at the annual dinner; in July and August we feared he would scarcely be fit to be present so soon—a fear, however, which has happily proved groundless.

“In the year 1895, before the great majority of those present to-night were born, Tom Houston took an honour degree in medicine in the old Royal University of Ireland. 1895 seems very long ago when one recalls to mind that in that year Röntgen discovered “a new kind of ray,” which he later called the X-rays; that Joseph Lister, not yet a baron, having triumphantly vindicated his application of Pasteur’s researches to surgery, ascended the presidential chair of the Royal Society; and that in the September of the same year Louis Pasteur himself, full of years and honours, reached his journey’s end, having blazed the first trail into the unexplored field of bacteriology. The youthful graduate was destined in future years to follow that trail, stimulated by his lifelong friends, Professor Lorrain Smith and Sir Almroth Wright. There he has opened up some new country, has put hæmatology and clinical pathology on a sure footing in Northern Ireland, and has stimulated, year after year, in younger men, a love of pathology. When journeying along the trail he has ever played the part of the good Samaritan, especially to his colleagues and their families. Sydney Smith once wrote: ‘you find people ready enough to do the Samaritan, without the oil and the twopence’; but Tom Houston never failed to pour oil into the wounds—the soothing oil of

his great heart and skill. No one will ever know of the twopences, unobtrusively bestowed, nor of the hours spent over the microscope in the old 'path. lab.' at Queen's, in the King Edward Building, and, in later years, in the Institute of Pathology, without fee, but with the award of the love and gratitude of a great multitude of men, women, and children.

"During the fifty odd years he has travelled this trail he has seen the antiquated Royal Hospital give place to the Royal Victoria Hospital and its attendant satellites; he has seen the Queen's College become the Queen's University, and of which he himself is the revered Pro-Chancellor; he has seen the medical school grow from strength to strength; and ever he remains our 'verray parfit gentil knight.'

"I will end with a further scriptural quotation which I think applicable to the son of the manse whom we honour this evening. The words contain one of the greatest tributes our Lord ever applied to any of His disciples. When I hear read this passage from the Gospel of St. John I always think of Tom Houston. 'Jesus saw Nathanael coming to Him and saith of him—Behold an Israelite indeed, in whom is no guile!'

"Sir Thomas, I have the great honour of presenting to you this portrait on behalf of my colleagues on the Royal staff. Mr. McKelvey considers it one of the best things he has ever done. I think everyone must agree that he has produced a beautiful picture and a striking likeness, and has caught the atmosphere of the Lab. in a truly realistic fashion."

SIR THOMAS HOUSTON replied :—

"I feel it is quite impossible for me to express in words my appreciation of the honour you have done me to-night. I look upon this portrait as a token of your esteem and regard. It is from the brush of Mr. Frank McKelvey, who has produced not only a good likeness, but also a work of art. I greatly admire his treatment of my laboratory coat.

"I have always been proud of my connection with the Royal Victoria Hospital, and this association goes back for many years—to the time when the hospital was in Frederick Street—to the days when James Cuming, Thomas Sinclair, Jack Browne, John Fagan, and John W. Byers were prominent members of your staff. I have many happy memories of my years of active duty, and these memories were greatly enhanced by the cordial relations that always existed with my colleagues: you have treated me with kindness, consideration, and generosity. In recent years, since my resignation, there are two things that have impressed me greatly and evoked my gratitude. When I resigned, you cordially invited me to continue to work in the laboratory, and my successor, Dr. Nelson, gave me a warm welcome, so that my old corner was reserved for me. I wish Dr. Nelson every success in keeping his laboratory up to modern requirements. His energy and enthusiasm augurs well for the future. The other point which I wish to mention is when I had to battle with a sea of troubles. When one suffers 'the slings and arrows of outrageous fortune,' one is greatly helped by the kindness and sympathy of one's friends, and in this matter I owe much to the members of your staff. Please accept my heartfelt thanks.

Changing Outlooks in Preventive Medicine

By SAMUEL BARRON, M.R.C.P., D.P.H.

Presidential Address, Ulster Medical Society, Session 1948-1949

EVERYONE will agree that the outlook in the practice of medicine has undergone a marked change since the coming into operation of the Health Services Act on the 5th July of this year (1948). This date will be recorded in history as an eventful one, for, in it, the story of the evolution of medicine has opened a new chapter.

I shall not attempt to express an opinion on the merits or demerits of the new Order, as this might involve trespass into the field of party politics, and this, I understand, would not be properly within the terms of the activities of the Ulster Medical Society! I rather choose to confine my remarks to the changed outlook in public health, and to direct attention to the recent advances in the field of social and preventive medicine.

As a means of visualising the expanding scope of preventive medicine and its application to the new social outlook, I feel that it would serve a useful purpose if we traced its evolution through the historical phases of its development to its present status.

From the dawn of history man has been engaged in an endless struggle against disease; the desire for knowledge of how to live long and how to avoid disease has persisted throughout the ages. The same demand has also been expressed by the age-long quest for magical drugs, herbs, philosophers' stones, and various charms and elixirs having the reputation of being life preservers.

In spite of these irrational quests, most people have observed some more or less rational codes of law for the preservation of their health.

The principles and practice of sanitation were known very early in Man's history. As you are aware, there is a code of sanitary law laid down in the early books of the Bible, wherein Moses commanded the Children of Israel to observe frequent purifications and cleansings; to isolate the sick; to disinfect houses where plague had prevailed; to destroy infected articles; and to avoid contamination of food. Many of these health regulations of the ancient Hebrews have sound common sense underlying them: indeed, with little or no modification, some of them are quite appropriate in our modern sanitary code.

Some of the Mosaic Law is interspersed with superstitious practices, but we could learn much from the manner in which the legislation was framed. Like our modern legislation, there were penal clauses governing infringements; but there were also incentives for encouraging obedience.

It will be remembered that the moral law summarily comprehended in the Ten Commandments is prefaced by the words "I am the Lord thy God, which have brought thee out of the land of Egypt, out of the house of bondage"—thus reminding the Children of Israel that the Commandments were of Divine origin,

and, therefore, anyone disobeying them was committing a sin. There was also the reminder that the Children of Israel had been freed from slavery and that they should show their gratitude by observing the terms of the Commandments. In like manner, many of the sanitary and health laws were prefaced by the words "Thus saith the Lord," with the same objectives towards encouraging obedience.

In passing, it should be observed that the Fourth Commandment—"Remember the Sabbath Day to keep it holy; . . . in it thou shalt not do any work"—provided not only an institution for the observance of religious ordinances and spiritual welfare, but also a valuable adjuvant in preventive medicine, providing, as it does, a day of rest every week for the recuperation of vigour and physical needs of the body.

Sanitation is generally regarded as a new science; as an art which has been entirely developed and even perfected in comparatively recent times! But, sanitation is not new! Indeed, it is an art with a heritage of thousands of years of actual experience and application. It is true that there was a distressing interlude of several centuries—known as "The Dark Ages"—when sanitation was forgotten or its application neglected; but, as previously indicated, its beginnings go back to the days of Moses, as well as the periods of Hippocrates, Galen, and Asodka.

The practical application of sanitation in ancient times is revealed by excavations of ruined cities in several parts of the world, particularly in Irak (Mesopotamia), in the plain between the Rivers Tigris and Euphrates. These cities were occupied by the ancient Sumerians who lived six thousand to eight thousand years ago. The houses were provided with laid-on water supplies, water closets, drains, etc. The elaborate sanitary arrangements of these ancient cities cannot fail to excite our admiration and wonder. The ancient cities of Assyria, Rome and Greece show that the practice of sanitation was applied in the provision of adequate water supplies, elaborate public baths and facilities for personal cleanliness.

It is disappointing to find that the extension of the practice of hygiene and sanitation did not proceed with the progress of time, and in the dark Middle Ages sanitation appears to have been forgotten amid the squalor of ignorance, superstition and witchcraft. The public sanitation of Crete and Rome and the personal hygiene of the Golden Age of Greece gave way to filth and its companion, disease. Pestilence reigned supreme, with leprosy following plague, to be succeeded in turn by syphilis, typhus, smallpox, and such strange scourges as the "dancing mania" and the sweating sickness. The history of the Dark Ages is one continuous story of pestilence, famine, poverty and war.

This unsatisfactory state of affairs reached a climax in the middle of the fourteenth century, when the terrible epidemic, known as the "Black Death" (bubonic plague), occurred. One quarter of the population of Europe succumbed to the disease. Not until 1666 was England freed of this plague, and then only by another disaster—the great fire of London—which apparently burned the rats which are known to be instrumental in carrying the disease.

After the epidemics of fevers, famine and pestilence had come to an end in England, they continued to scourge Ireland for centuries: an interesting paper on

"Famine Fevers in England and Ireland" appears as a reprint from the Journal of the British Archaeological Association in the *ULSTER MEDICAL JOURNAL* of May, 1948. The article was written by that distinguished Queensman, Lieut.-General Sir Wm. MacArthur.

It is not my intention to recount the evolution of the growth of knowledge of medicine, but it is interesting to note that Hippocrates, the "Father of Medicine," was a sanitarian as well as a physician. Among his numerous literary endeavours he wrote three books on hygiene and sanitation, designated by him as "constitutions and environments." Long before the days of Hippocrates (460-377 B.C.) men had sought to stem the tides of disease which threatened to overwhelm them. It was not, however, until the Middle Ages that the ravages of pestilence compelled attention to be given to the conditions which seemed responsible for such epidemics.

Amongst the ancient theories held to be responsible for the occurrence of epidemics was one that epidemics were largely influenced by air, climate and season. In the seventeenth century Sydenham, an English physician, elaborated the theory of epidemic constitutions by attributing diseases to "occult atmospheric influence," which led to cyclical outbursts of epidemics. Whether or not the atmosphere causes disease, it has, through all time, been a popular theory that the air or atmosphere has some connection with infection. Our present conception of spread of infection by "droplet" nuclei lends support to aerial convection of infection.

We also know that certain infectious diseases show seasonal cycles of epidemicity (e.g. poliomyelitis), but we do not yet know the reason. Long before the advent of the discovery of pathogenic bacteria, observers explained the seasonal prevalence of certain infections by the emanations of ground air or miasma which resulted from the decomposition of organic matter in the earth's strata—the foul air being expelled by the rise of the ground water. This explanation of epidemiology was interwoven with the then accepted principle that "dirt produces disease." As Sir John Simon put it in 1874: "filth is the deadliest of our present removable causes of disease." This view was supported by the observations that epidemics prevail where there are sanitary defects; that extension and spread of these epidemics is exactly proportional to the extent of bad sanitary conditions; that epidemics are controllable by controlling these conditions; and that the want of pure air is a factor in the causation of epidemics.

The view that effluvia from organic filth, especially those in the form of sewer air, are capable of causing infectious fevers is still held, even by some of the more intelligent people in our community. It is still a common occurrence to receive requests for the testing of the drains in houses where infectious disease has occurred—the request is invariably supported by the contention that the illness was contracted by exposure to foul air from the drains or sewerage system of the affected house.

Until the middle of the nineteenth century sanitation was the only weapon we possessed for the suppression of infectious disease, and, however much we may claim for the more modern methods of controlling infection, e.g., immunisation, etc., we must admit that many infectious diseases were brought under control by the cleaning-up of environment.

In Britain typhus was well under control before Nicolle and his co-workers in 1909 reported the transmission of typhus to monkeys by body lice which had fed on a human typhus patient; evidence accumulated that the body louse was the vehicle of typhus infection, but it did not follow that the stress laid by Medical Officers of Health, in their efforts to stamp out typhus, on measures of cleansing and disinfection, reduction of overcrowding, slum clearance, and other attentions to hygiene and sanitation, was wasted.

Apart from the application of sanitary and hygienic measures, it was found that the prevention of some diseases was accomplished a long time before the complete knowledge of their causation was discovered. The prevention of scurvy and beriberi was accomplished many years before these diseases were known to be due to avitaminosis or dietetic deficiencies. It will be remembered that the compulsory supply of lemon juice in the Royal Navy as an anti-scorbutic measure became operative in 1795. Then in 1796 came the famous discovery of Dr. Edward Jenner that the inoculation of persons with cow-pox virus gave protection against the infection of smallpox. This discovery had far-reaching effects in the prevention of infectious disease, and really forms the basis of our conception of immunology.

Out of the welter of disease and death of the Middle Ages there gradually developed the "Golden Age" of medicine. This began to make itself manifest about the end of the eighteenth century. Thoughtful people discovered that it was unprofitable and distressing to undergo the ravages of repeated epidemics. Such pestilences interfered with commerce and industry, as well as with the peace and happiness of the people, and the whole organisation of society.

Then followed a revolt against the shocking living and industrial conditions which were associated with the Industrial Revolution. It was not a particularly enjoyable or healthy occupation to be a factory worker in those days, especially if one were a child, as were many of the persons then employed in English factories. Neither was it a joke to be an inmate of a British prison in the eighteenth century. (I assume it is no joke even to-day!)

As a result of the pioneer work of John Howard and the good Earl of Shaftesbury, there was a rapid succession of preventive public health measures which resulted in a clean-up of prisons and factories which, up till then, had been hotbeds of typhus and insanitary conditions. Just as gaol fever—the louse-borne typhus—spreading occasionally to the general public stimulated the reform of the prisons, so vast epidemics of cholera led to the establishment of sanitary authorities who were charged with the duty of controlling epidemics.

The first Public Health Act of 1848 (just one hundred years ago) was the direct outcome of the revolt against a host of barbarities and degrading industrial conditions. The changed outlook in favour of health reform was stimulated by the remarkable advances in medical knowledge, particularly the germ theory of disease which resulted from the discovery of pathogenic bacteria by Pasteur and other bacteriologists, such as Robert Koch, Kitasato, Yersin and Roux; the introduction of antiseptic surgery by Lister; of vaccination against smallpox by Jenner; and the discovery of chloroform by Simpson acted as stimuli to the progress of

the movement towards health and a better-informed public opinion on health matters.

As the result of the application of the new knowledge, the second half of the nineteenth century was the period of the great advances in medical treatment—anaesthesia, antiseptic and then aseptic surgery made it possible for a vast increase in surgical art and daring, but the application of bacteriology and all that followed the discovery of the parasitic nature of infection completely revolutionised the control of infectious diseases, and brought about a disappearance of many diseases formerly regarded as inevitable. I shall only refer to two of these—typhoid and diphtheria.

Two triumphs of preventive medicine in our time are the reductions of typhoid and diphtheria to near the bottom of the list of killing diseases. The two diseases have many epidemiological features in common, but their suppression has been effected through different channels. Typhoid has been largely conquered by the cleaning up of environment through the application of the principles of sanitation, whilst diphtheria has yielded to the science of bacteriology in the application of preventive inoculation. Diphtheria did not yield to sanitation; inoculation succeeded where sanitation failed.

As previously stated, typhus has also yielded to sanitation, even before the sheet anchor of control lay in the knowledge of “no lice—no typhus”—now greatly facilitated by the new insecticides of the D.D.T. class.

As a result of the recent advances in bacteriology and epidemiology, most of the bacterial infectious diseases are now capable of being effectively controlled. With the gradual disappearance of the common bacterial infections, we appear to have an increase in virus infections.

Our knowledge of viruses is still far from complete, and epidemiological data of virus diseases are not understood; consequently, we are not yet in a position to take effective steps to cope with virus epidemics. These impediments apply particularly to virus diseases of the central nervous system, such as poliomyelitis and polioencephalitis, but our knowledge of the factors involved in the spread of virus infections is progressing favourably. With the increase in knowledge, I feel that we will be in a position to take effective measures against virus diseases in the near future.

During the last thirty years the field of preventive medicine has gradually expanded to include preventive clinical work, particularly in the Maternity and Child Welfare and School Health Services. There are now in the Public Health Services many more doctors engaged in clinical work than on administrative duties. There is, therefore, a demand for medical officers having special training in preventive clinical work. The curriculum for the Diploma in Public Health has been altered to make provision for elective and vocational training, with a view to meeting the qualifications required.

(I shall return to the subject of education in social and preventive medicine when dealing with the subject of social medicine.)

Until recently, Public Health was mainly concerned with the prevention of

diseases the causes of which were known. It was not interested in the vast subject of impaired health, and little interest was taken in the social movements to improve the health of the people.

A few years ago I addressed a meeting of the Belfast Civic Society on the subject "Are Belfast People Healthy?" I informed my audience that, whilst I had information on the incidence of notifiable infectious diseases, the number of deaths occurring, and the causes of death, together with figures of vital statistics, I was unable to answer the question as to the state of health of the citizens, because I did not know, nor had I the means of ascertaining the quantity and quality of sickness affecting the population.

More attention is now paid to the prevention of morbidity. Many illnesses, such as the common cold, chronic rheumatic conditions, etc., have a low mortality rate, but are the cause of much sickness and injury to health, besides being responsible for much misery, loss of work and industrial inefficiency. Recent surveys of morbidity in parts of Great Britain have revealed most interesting information on the prevalence of sickness and the consequences in various aspects of preventive medicine, output in industry, etc.

We have gradually come to realise that no sickness is possible without some mental disturbance; and that the mental or psychological attitude of our patients must be taken into account in the treatment of all departures from health.

Preventive medicine has now shifted its outlook from the suppression of specific causes of specific diseases to the management of personal and environmental stresses which interfere with the maintenance of full health and full vitality. This new phase was first applied in industrial medicine. The report of the Industrial Health Research Board had indicated that medical science could rob industry of unnecessary fatigue, and effectively control or prevent most of the industrial diseases. The application of the principles of industrial medicine has brought about a marked advance in the physical and mental health of the industrial worker. This field of preventive medicine is still in its early stages of development.

One of the new problems awaiting solution is that relating to the health of old people, and there is much need for research in the field of geriatrics, particularly more specific knowledge of the causes of crippling disabilities of the elderly, and their prevention. It is possible that we shall not be able to define healthy maturity until we learn more about the chronic degenerative diseases.

The Robert Campbell Memorial Oration was delivered in 1947 by Professor J. Henry Biggart, who dealt with "The Contributions of Pathology to our Knowledge of Internal Environment." In introducing his subject, Professor Biggart referred to the importance attached to the influence of external environment on health and disease—housing, nutrition, conditions of work, etc. He suggested that it would be beneficial to examine the mechanism which preserves the integrity of the body and maintains what Claude Bernard once called "the internal environment." It is a requirement for good health that all bodily activities are bound together and co-ordinated. Professor Biggart recited much evidence in support of the theory that that portion of the brain known as the hypothalamus was the nerve centre concerned with the regulation of bodily functions. When this co-ordinating centre is

subjected to long, continued strain, or when disease attacks it, the regulating mechanism becomes upset, and signs and symptoms of disease become apparent : over-stimulation of the centre occurs when the external environment varies greatly from its normal range, and it is suggested that this repeated over-stimulation may be a factor in the causation of our chronic degenerative diseases, such as high blood pressure, arterial disease, peptic ulcer, kidney diseases, etc. It is difficult to say how much of this degenerative change is preventable, but we have seen that external environment and internal environment are inter-dependent : an unsatisfactory external environment has a deleterious influence on the internal.

Deteriorations of structure and function are characteristic of the later years of life. But the age of onset and the extent of these changes vary strikingly in different individuals, the determining factor being the interplay of constitution and environment. Those who break down prematurely may have an inborn relative weakness of some organ or internal environmental regulatory system, but that potential weakness betrays them when the long-continued play of environmental stresses has exposed it.

What are the damaging stresses?

Unfortunately the seeds of degenerative disorders are usually sown so many years before the onset of signs or symptoms that it is, as yet, impossible to say. There is growing evidence, however, that many complex factors of constitution and environment are involved. Such general factors as nutrition, sleep, mental health and recreation are undoubtedly important. So the diseases of degeneration may conceivably begin to take shape even in childhood.

Chronic degenerative diseases are taking an ever-increasing toll of life, as is revealed by a study of vital statistics, showing their high place in the relative frequency of killing diseases. This is partly accounted for by increasing longevity and the ageing population : in 1951 it is estimated that $11\frac{1}{2}$ per cent. of the population of Great Britain will be persons over sixty-five years of age. But it is significant that degenerative diseases are now relatively frequent as a cause of death in the middle-aged.

The problem awaiting solution, from the point of view of prevention of degenerative changes, would appear to be the removing or counteracting the damaging stresses which play a role in their causation. I fear that the hurry and bustle of our modern civilisation demand the the continuation of some extrinsic stresses, and that many "stress" factors in our social and economic systems lie outside the control of preventive medicine.

Gradually, however, more and more diseases are coming within the range of preventive methods, chiefly those dependent upon some known essential extraneous factor, such as those found to operate in industrial diseases, deficiency diseases, etc. It is hoped that even the "degenerative" or "stress" diseases may yield to preventive measures.

We have learned to look beyond the individual; first and foremost to the family in which he lives; then to his work and play; and to the home and social background. Social factors play a large part in the etiology of many diseases; the economic and emotional effects of illness are transmitted to the patient's family

and his dependants. The proper ascertainment, prevention and treatment of such diseases must be studied from the standpoint of the family as the unit.

We are living in a world of rapid social change. We have arrived at the stage of the evolution of preventive medicine when we must expand our conception of preventive measures to embrace those social and psychological factors which are so important in both curative and preventive work. The advent of social medicine has, therefore, widened our outlook: indeed, it would almost appear to have brought about a reformation, if not a revolution, in the old conception of preventive medicine.

Social medicine is a comprehensive term; it takes into account certain cardinal factors other than the actual morbid processes contributing to the etiology of disease. It recognises that, whilst satisfactory environmental conditions are of importance in the preservation of community health, these do not go far enough. The benefits derived from a study of the biological needs, the intrinsic potentialities and constitutions of human beings can be applied in both the prevention and cure of disease. The problems of sociology are largely the problems of preventive medicine. Most authorities agree as to the aims and objects of social medicine, but there is some conflict of opinion regarding the administrative machinery through which these objects are to be attained. It is agreed that social medicine has many links with clinical medicine, as well as with the whole of the public and industrial health services.

It has been pointed out that the problems of communal health are indivisible, but their solution can only be elucidated by team work in which Medical Officers of Health, medical practitioners, including specialist and hospital medical staff, nurses, and social welfare workers take part.

Difficulties arise in connection with the application of social medicine as a curative measure, owing to the fact that few medical practitioners can afford the time to carry out medico-sociological investigations—even assuming they have had the necessary training and experience in such investigations.

This work can be undertaken by specially-trained social workers, but it is a distinct advantage to have a medical qualification or trained nursing as a background in order to fully appreciate the significance of adverse sociological influences in the causation of illness and the steps necessary for their correction.

An even fuller appreciation of the social stresses is required in the prevention of illness in which social factors may be involved, particularly those connected with personal anxieties, family difficulties, etc. After all, the remedying of social ills is as much prevention as the promotion and safeguarding of the people's health by improvement of their housing, their nutrition, or increasing their resistance to infection by preventive inoculation.

Whilst on the subject of training in medical sociology, I might be permitted to return to the subject of undergraduate and post-graduate training in the preventive aspects of medicine.

The General Medical Council, commenting upon the recommendations of the Goodenough Report, agrees that adequate social medicine requires the promotion of measures other than those usually employed in the practice of remedial medicine;

they advise that "A new orientation of medical instruction is required. The idea of social medicine must permeate the whole course of undergraduate teaching, instruction in certain aspects of social medicine should be given during the period of pre-clinical studies, and also during the clinical period. The student should see his teachers enlisting the help of almoners, psychiatric social workers, health visitors, and other welfare experts, and also considering clinical problems in the light of the patient's domestic circumstances and environment. He should also learn something of the communal and administrative aspects of preventive medicine, and should acquire an elementary knowledge of the duties and responsibilities of a Medical Officer of Health. By this means, he is led to appreciate that prevention is a communal as well as an individual problem, and to realise the ways in which a general practitioner can help the Medical Officer of Health, and, in turn, can be helped by him in his own practice. His understanding of these matters and of social medicine generally is likely to be aided if he is given an elementary account of the development of the medical and social services; of their relation to the social structure; and of how progress in the promotion of health has been hindered by such evils as bad housing, ignorance and unemployment."

In all these matters, the attention of the medical student should be directed to the preventive aspects when dealing with the ætiology of particular diseases. I am afraid that too little attention has been paid to ætiology in clinical teaching in the past, and I am pleased to know that Professor A. C. Stevenson, who was recently appointed to the Chair in Social and Preventive Medicine, has already taken steps to implement the recommendations of the General Medical Council in the teaching of preventive and social medicine at the bedside, in the homes of the people, as well as in the lecture theatre. This approach cannot fail to impress upon the medical student the importance of the preventive aspects of medicine.

I have already referred to the change in the syllabus of training for the Diploma in Public Health. The new curriculum makes provision for a preliminary "Certificate" Course which seeks to lay a good foundation of basic training for any branch of the Public Health Services; whilst the "Diploma" Course offers a substantial choice of elective subjects for those who wish to take up special branches in these services.

The curriculum has two basic divisions :—

- (a) Basic subjects, such as Sanitary Law and Administration, Epidemiology, Medical Statistics, Applied Physiology, including Nutrition, *and*
- (b) Elective subjects, which include Industrial Health, Tropical Medicine, Parasitology, Medical Entomology, as well as senior courses in Administration, Nutrition, Statistics, etc.

The new curriculum is thus more appropriate for meeting the qualifications now required of medical officers for appointments in the various branches of the Health and Welfare Services.

The amended D.P.H. training scheme gives some indication of the trend of policy in social and preventive medicine, and the changing functions of the Medical Officer of Health. Those of you who have taken the D.P.H. qualification will recognise the departure from the practical courses in analytical chemistry and

bacteriology which were so necessary in the days when the Medical Officer of Health was required to act as Bacteriologist and Public Analyst.

Time does not permit me giving details of anticipated activities of a Health Department under the provisions of the Health Services Act. The role of the Medical Officer of Health within the new legislation is only part of his many duties. He has substantial responsibilities under many other statutes. The new Act modifies and considerably extends the personal health services, particularly those of domiciliary midwifery, health visiting, home nursing, care of sick persons in their homes, after-care of patients discharged from hospital, and rehabilitation of "misfit" patients.

One of the commendable objects of the new Health Services Act is the provision for the establishment of a closer integration of the preventive and curative agencies. Each of the three Statutory Authorities: the Hospitals Authority, the General Health Services Board, and the Health Authorities, as well as many voluntary organisations, have responsibilities for, or undertake, services of a similar or closely allied nature. It is of great importance that the activities of each of these bodies should be interwoven by mutual co-operation in their common interests; otherwise there will be overlapping of functions and disorganisation of administration. Already much has been accomplished in linking up these "common" interests, but further amalgamation will be necessary as new services are developed or existing ones extended.

It is suggested that an effective method of securing close integration of services and active co-operation, as between the different agencies, would be the making of joint appointments or co-opting of members on the various Management or Advisory Committees of each of the Authorities.

Another commendable feature of the Health Services Act is the stress laid on education of the public in matters of health. Here, again, several bodies have interests in the matter, and their activities require co-ordination. "Although adequate medical, surgical and dental treatment will bring great benefits to the people, prevention of disease and the concept of positive health must be kept in the foreground."

There is a growing demand for health education. As stated in my opening remarks, this demand has existed from the earliest times, but the request for information on the methods for the promotion of health, rather than the prevention of disease, should be adequately met.

The public usually attach more importance to the cure of illness than to measures for the promotion of health. Many still clamour for the bottle of medicine, and will not be satisfied with the advice that the practical application of a code of health rules and a healthy way of life is of more importance than the bottle of medicine. There is a need for improvement in health by nutritional, educational and recreational methods, and these must be kept in mind in dealing with the subject matter involved in health education.

The more rapid advances in preventive work have been made in the wake of new scientific discoveries. In the past there has been a considerable lag in the application of new discoveries to the prevention of disabilities, disease and death.

The search for new knowledge in the medical sciences is being expanded throughout the world, and many baffling problems in epidemiology, cancer, mental disease, etc. will be overcome. We must be in a position to take advantage of new discoveries which provide a preventive weapon for the conquest of disease. Our work in the preventive field must develop more into research channels by the ascertainment of defect; not only in the individual and his environment, his family, and his home, but also in the community.

The importance of the social aspects of research work has already been referred to. Many pressing problems awaiting solution in preventive medicine could be mentioned: a large number of these, however, require further investigation and research.

Before appropriate preventive measures can be taken, it is necessary to have accurate information on what the problems are; discovery of their essential causation; means of remedy; and such points as the size and nature of the problem; the domestic, social, and psychological factors which may be involved, as well as other relevant data.

The information can only be obtained by the application of scientific methods of recording and assessment, and it is in this branch of research work that the university can be of practical assistance to the Medical Officer of Health. For this reason alone it is highly desirable that there should be close co-operation between Health and Welfare Authorities and the university.

I have already drawn attention to the need for research into the causation of degenerative diseases and crippling disabilities of old people.

Many problems connected with maternity and child welfare merit further investigation, although much progress has already been made in this field. The same remarks apply to maternal mortality and morbidity, and to the prevention of dental caries.

We have barely started to investigate cardio-vascular diseases, arthritis, rheumatism, cancer, and better means with which to detect and treat malignant diseases.

Mental health is known to be one of the most important requirements for a healthful, happy life at all stages, but our efforts in research in this field appear to be restricted, owing to the shortage of trained personnel and facilities for investigation.

For many years I have held the opinion that preventive aspects have not been given a sufficiently prominent place in the practice of medicine. Public health has not been popular as a career in the medical profession. It is looked upon as an occupation which does not require any special scientific knowledge or qualification in medicine. Indeed, the Medical Officer of Health has been regarded more as a genteel plumber whose interests were more concerned with drains and sewers than with measures for the promotion of health and the prevention of illness! It is hoped that this "drain-pipe" concept of preventive medicine will disappear.

I have, therefore, taken advantage of this opportunity of calling attention to the changing outlooks in preventive medicine as the subject of my address, with the hope that it may stimulate your interest in the advantages of the prevention of ill-health, rather than the importance of the cure of disease.

I have, perhaps, been too idealistic—not always with my feet on the ground! I realise that I have said nothing very new, but it will give me at least a sense of satisfaction if I have succeeded in awakening your interest in the measures to promote the priceless blessing of health!

There is an essay on "Health and Long Life" by Sir William Temple, published in Dublin in 1701 and written in the old English style: I possess a copy of the book, from which I have copied the following phrase:

"If health be such a blessing and the very source of all pleasure, it may be worth the pains to discover the regions where it grows, the springs that feed it, the customs and methods by which 'tis cultivated and preserved."

It seems to me we are still engaged in this quest for the regions of health!

REVIEW

AIDS TO BIOLOGY. By R. G. Neill, M.A. Second Edition. Pp. vii + 279. 21 illustrations. London: Baillière, Tindall & Cox. 1948. 6s.

THIS is an excellent number of the well-known series of "Student Aids," and, although primarily designed for the student reading Biology for School or Higher School Certificate, or for the Preliminary State Examination for Nurses, can be recommended for the first-year medical student as a very useful book of its kind. It will give him that bird's-eye view of biology which is so difficult to gain from the detailed courses in botany and zoology, especially when these subjects have not been taken in the more leisurely atmosphere of school. A judicious balance has been kept between the two great divisions of the living world, and also between facts and theories, structure and function, and it is quite surprising to see the wealth of information which has been packed into the ten chapters of this short book. The author has every right to be didactic in a work of this kind, and, for the most part, his statements can be readily accepted. However, to say, as he does, in the chapter on respiration, that quiet respiration in the human is mainly carried on by the diaphragm lifting the "floating ribs," and thus, incidentally, giving an answer to the question as to what the "floating ribs" are for, calls for some comment. The term "floating ribs" in human anatomy is applied to the last two ribs which end freely anteriorly, and the term "false ribs" is used for all the lower five ribs which do not normally articulate directly with the sternum; of these, only three are jointed together through their costal cartilages, and act through the articulation of the eighth and seventh costal cartilages on the sternum. To attribute the main respiratory movement to the enlargement of the thorax, brought about by the diaphragm acting from a fixed apex in raising the costal margin, and to say that abdominal breathing is not very often done, is doing less than justice to the alterations in abdominal contours which are so very obvious in quiet breathing at all ages, and also neglects the evidence of cine-radiography, which shows that the diaphragm descends while the costal margin ascends. It is a good thing, however, to find that the third method of using the respiratory mechanism is stressed, as it is all too often overlooked completely. It would seem that there is still too much to be finally settled before an exact statement can be made as to the way respiratory movements are carried out under varying conditions of bodily posture and activity. The chapter on reproduction and sex is very well written, but an error as to the relation of the vas deferens to the spermatic cord appears in the text on page 166, and is repeated in figure 12. The vas should be shown as forming one of the constituent structures of the spermatic cord, and not as a completely separate structure, unrelated to the cord. Another minor correction is called for with regards the time taken for the fertilised egg in the human to reach the uterus. It is now generally agreed that only four or five days are required from the estimated date of ovulation. These criticisms of the more particularly human sections of the book should in no way be allowed to detract from the overall excellence of the work, which has an exhilarating vitality so rarely found among textbooks.

W. R. M. M.

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W. R. M. M.

The Patient and His Doctor

By F. A. MacLAUGHLIN, V.R.D., M.B., F.R.C.S.(ENG.)

Opening Address, Winter Session, 1948-1949, Royal Victoria Hospital, Belfast

THIS subject is one which is always of interest to those engaged in the Art of Healing, and has been so all down the ages.

It is interesting to try and trace the origin of the differences in this relationship, its evolution and change in different parts of the world, in different periods of time.

It is probably true to state that it is possible to find all the different stages and variations of this relationship, as traced down the ages, represented in various parts of our contemporary world, where every stage from the most primitive aboriginal tribal medicinal methods, to the most modern and advanced diagnostic and therapeutic methods carried out in palaces of healing, can be discovered with comparative ease in our rapidly-shrinkng globe.

It is perhaps better and more satisfying to try and probe back as far as possible into time and find out what we can, the great difficulty being that one reaches a stage where historical evidence leaves the realms of fact and wanders off into mythology, and, while the tales of mythology are very interesting, they are somewhat liable to suffer by repetition in their transmission through the ages. Where, however, we have something like fact, one finds that the order and dating of these facts permits one to place them better in relationship to each other, and to assess their influence one upon another, and so trace the evolution of a relationship such as this down the corridor of time.

In the most primitive communities there usually was some individual who stood out, perhaps because of his intelligence and interest in matters medical and magical, and his influence grew both as regards the everyday life and health of the people: he guided the tribe by superior wisdom and experience, and endeavoured to raise his status by differences in dress and behaviour, and perhaps by holding himself aloof. Here we observe the evolution of the medicine man or witch-doctor, who, with his incantations, spells, amulets, and charms, used these, combined with carefully-concealed knowledge handed down as folklore from his predecessors, to impress the more simple members of his tribe, and it is easy to see the gradual accession to power of these primitive priests, who gradually acquired both temporal and spiritual power over tribes and communities, and this priestly domination persists still in magical medicine as practised among primitive peoples. All down the ages the priest and physician endeavoured to exaggerate their position by their dress, with priestly robes, wig and gown, collar and gaiters, and even the frock coat and top-hat of our own days. This difference still persists to-day in the garb of churchmen, but now it is almost impossible to detect the doctor by his dress amongst his fellows, although it is often possible to have a shrewd guess at his profession by his conversation and general demeanour.

As far as getting any reliable evidence goes, it would appear that the earliest records which have been handed down, with any sort of documentary backing, are Chinese and Egyptian.

Chinese medical lore goes back to the beginning of Chinese history itself, and, like all primitive men, they believed that sickness was controlled by the Unknown—thunder, lightning fire, sun, moon and stars; and disease was due to the possession of the body by evil spirits. Hence the earliest relationship between the patient and his healer was the priestly one—more concerned with casting out devils, incantations and spells in which the healing of herbs had no place, and, indeed, in which the main object was the laying of the devil, and the patient, being a mere incident in the priestly mind, was liable to suffer in the process.

The early Chinese character for doctor was made up of three parts: a chest of arms, a hand grasping a weapon, and a sorcerer or priest, hence the meaning was that a priest used strong weapons to kill disease. Later, about 1100 B.C., the character changed and the sorcerer or priest symbol was replaced by one meaning wine, denoting that decoctions and elixirs were given to the patient.

No doubt this marked a very agreeable change in the relationship between healer and healed.

The Chinese were never very scientifically minded; they believed in such treatment as acupuncture, there being hundreds of points for puncturing to relieve various diseases of different organs, and a number of different needles. This method was supposed to let out the evil air which caused the disease—and the master-mind who perfected this method of torture was the Chinese Hippocrates, Chang Chung Chin, and his method penetrated eventually to Europe, a Dutch physician writing a paper upon it in 1683.

One likes to speculate on the number of inoculations with other diseases which must have been carried out by this method, and also on the numbers who succumbed to their treatment unnecessarily—which facts go to prove that faith has ever been a strong suit in humanity when ill.

The Chinese and Japanese later became great believers in counter irritation and used physical, chemical, and manual methods of producing this in their attempts to cure disease: indeed some of their methods produced a swelling and inflammation far worse than the original disease.

Hence, so far, we see that the lot of the sick has been a hard one. Surgery never developed in China because of the Confucian doctrine that the body was sacred and could not be mutilated—so debarring dissection of the dead, and the performance of any operation which could be thought to be mutilation, and so sacrilege, on the living. To the present day the Chinese are reckoned to be among the finest patients in the world because of their stoicism, and perhaps it is no wonder after centuries of suffering inflicted and borne in the name of Healing, that perhaps the doctor-patient relationship in this part of the Far East is not one of the happiest, but is borne by a people who have known no better, with a high degree of patience and composure.

It is, perhaps, in Egypt that the earliest medical awakenings occurred, and probably fifty centuries ago the ancient Egyptians began to build the foundations

of their amazing knowledge, and it seems probable that a people who four thousand years before Christ evolved engineering and architectural feats involving cubic capacity, angles, fractions, and square root, must have been clearly far ahead of their contemporaries in intellectual capacity.

We are fortunate in having many medical papyri handed down to us, and it is interesting to notice here that the earlier ones are all medico-magical in character, one of the most famous ones dating from the 18th Dynasty, and this postulates that the healing was mainly done by the priests, with various incantations, spells, and sacrifices, and hence the priest-patient relationship prevailed, including fear. In later papyri Arabian and Grecian elements appear to have crept in also.

Magic played a very prominent part in the life of the Egyptians, and the idea of possession was evident—the diseases being personified, addressed, and harangued by the priest; hence the spells were full of references to the gods and were accompanied by ritual of gestures, the use of amulets, and later the giving of magical mixtures of all sorts—some nauseous and some disgusting—and of applications to be used on the body, with the idea that they might be unpalatable to the possessing spirit and help to drive it out.

It is characteristic of the magician that he should have alternative remedies, and these old records contain whole strings of alternative remedies to be used in sequence if the former ones tried are not effective.

One can imagine the relationship of fear, awe, and apprehension with which the ancient Egyptian approached his medical adviser. But we need not deride these methods, as our own British medieval medicine was very similar.

In the later days of Egypt, medicine became more rational and less magical, and here we see a marked contrast in the religious influence. In Egypt there was embalming and there was no embargo on cutting into the human body, alive or dead, as in China, with the result that as time went on certain of the priestly physicians became quite skilled surgeons, as has been shown by examination of mummies treated for disease. Their writings were some of the earliest on medical subjects, and the Egyptians were looked up to by the world of the time as the most enlightened nation medically; they gave many drugs, methods, manipulations, and treatments to the world, indeed many of their methods were copied into the medical writings of later civilisations, including Greece. They always maintained the magical approach to the more purely medical conditions, and wrote that they would “wrestle” or “contend” with the disease, denoting the idea of possession, whereas in injuries, wounds, and more purely surgical conditions the treatment was more rational, including trephining, bleeding, etc. Hence, medicine in Egypt must have entailed an approach via the priest and the temple, with a certain element of awe and fear, and consequently an absence of the human relationship between healer and healed which tends to help the sufferer. It does not appear to have been a cruel form of practice such as is found elsewhere, and included visits to famous temples where there were priest-physicians who specialised in certain types of disease and diseases of certain parts of the body.

In Babylon medicine appears to have been primitive, and they had no trained physicians—only men who professed to cure; and one reads that the patient was

put up on show that all and sundry might make helpful suggestions; but in spite of this, in the Code of Hammurabi (a king of Babylon), the law was such that any injury done in the course of treatment to a citizen or a slave by a "physician" had to be paid for by personal mutilation in the case of a citizen, or replacement of the slave to his owner by the said unfortunate or careless "physician," so that we see the elements of the protection of the patient being considered. They mainly relied on magical cures, but certain drugs are mentioned in the inscriptions.

It is when we come to the civilisation of Greece that we have more facts, and are dealing with a more truly civilised people, that we get a clearer idea of the early relations between physician and patient. It is a pity that more is not known about the Minoan civilisation in the Aegean which preceded the Grecian, flourishing, as it did, between 4000 and 1000 B.C. We do know, however, that the serpent came into their religion, it is thought because of its cunning and poisonousness, and probably also as it was the most dangerous living thing distributed in the eastern Mediterranean. This is considered to be the probable origin of the serpent in the cult of Aesculapius (293 B.C.), who was the God of Healing of the Greeks, and who carried a club-like staff with a serpent coiled round it and was usually accompanied by Telesphorus, the boy genius of healing, and Hygiea, the goddess of health. Hence the association of the serpent with evil; that disease is a penalty of evil doing, and that appeasement must be given to the feared evil and powerful influence as personified in the serpent, which has become the token of healing for thousands of years. Moses used it in the wilderness; it is still worn as an amulet on belt-buckles, brooches, and ornaments; and it is used on the crests and badges of various medical services and bodies.

In primitive tribes at the present day the snake is still regarded with awe and veneration for its cunning, evil, and power of doing harm, even as in the Garden of Eden.

In the early days of Greece, from about 1100 B.C., the medical methods used were probably similar to those handed on from preceding but neighbouring peoples, and the cult of Aesculapius was largely carried on in the temples under control of the priests, and had its headquarters in the island of Cos about the sixth and fifth centuries B.C. Then came Hippocrates, who was descended from a long line of physicians in Cos, about the details of whose life we know little, but he was in his prime about 400 B.C. and died an old man about 377 B.C. While we know little about the facts of his life, we know a great deal about the man and his knowledge from his own writings and those of his pupils.

As has been written of him by Charles Singer: "In beauty and dignity that figure is beyond praise. Perhaps gaining in stateliness what he loses in clearness, Hippocrates will ever remain the type of the perfect physician. Learned, observant, humane, with a profound reverence for the claims of his patients, but an over-mastering desire that his experience should benefit others, orderly and calm, anxious only to record his knowledge for the use of his brother physicians and the relief of suffering, pure of mind and master of his passions, this figure of character and virtue has had an ethical value to medical men of all ages comparable only to the influence exerted on their followers by the founders of the great religions."

To this man, perhaps more than any other, do the sick owe the humanity which is displayed in their care and treatment in our present-day medicine—the natural evolution of his methods.

The really human relationship between physician and sufferer only dawned with Hippocrates and his followers.

They founded a system, based not on theory, but on systematically accumulated observations; they endeavoured to divorce healing from magic, and also, largely, from priestly functions in practice; sought for natural rather than supernatural causes; and did not follow the usual Grecian method of vague deductive speculation; they did not meet together, as has been aptly said, “to discuss some new thing.” The patient was considered of more importance than the disease; their powers of observation were remarkable, noting progress and keeping accurate notes and observations, which have been handed down to us in the Hippocratic writings and descriptions of cases. The relationship which Hippocrates endeavoured to engender between physician and patient is, perhaps, best illustrated by the Hippocratic Oath, which was taken by the members of the school at Cos. The Oath I will now quote in full, as I find it is relatively seldom heard or studied.

“I swear by Apollo the healer, and Aesculapius, and Hygiea and Panacea and all the gods and goddesses, that according to my ability and judgment, I will keep this Oath and this stipulation—to reckon him who taught me this Art as dear to me as those who bore me, to look upon his offspring as my own brothers, and to teach them this Art, if they would learn it, without fee or stipulation. By precept, lecture, and all other modes of instruction, I will impart a knowledge of the Art to my own sons, and those of my teacher, and to disciples bound by a stipulation and oath according to the Law of Medicine, but to none other.

“I will follow that system of regimen which, according to my ability and judgment, I consider for the benefit of my patients, and abstain from whatever is deleterious and mischievous.

“I will give no deadly medicine to anyone if asked, nor suggest any such counsel, nor will I aid a woman to procure abortion. With purity and holiness I will pass my life and practise my Art. Into whatever houses I enter, I will go there for the benefit of the sick, and will abstain from every act of mischief and corruption, and above all from seduction.

“Whatever in my professional practice—or even not in connection with it—I see or hear in the lives of men which ought not to be spoken of abroad, I will not divulge, deeming that on such matters we should be silent.

“While I keep this Oath unviolated, may it be granted to me to enjoy life and the practice of the Art, always respected among men, but should I break or violate this Oath, may the reverse be my lot.”

Respected equally throughout the ages by Arab, Jew, and Christian, the Oath remains the watchword of the profession of medicine. I saw recently that it was suggested to make an addition to the Oath—that medical men should swear not to practise mass warfare against humanity—a sad reflection on the so-called progress of civilisation.

Osler sums up the debt of medicine to the Hippocratic ideal in "Aequanimitas" as follows :—

The critical sense and sceptical attitude of the Hippocratic school laid the foundations of modern medicine on broad lines, and we owe to it, first—the emancipation of medicine from the shackles of priest-craft and caste; secondly—the conception of medicine as an art based on accurate observation, and, as a science, an integral part of the science of man and nature; thirdly—the high morals expressed in that "most memorable of human documents"—the Hippocratic Oath; fourthly—the conception and realisation of medicine as the profession of a cultivated gentleman. Also in "Aequanimitas" Osler quotes various passages from Plato and Socrates, which tend to show that the properly accredited and cultivated physician in the golden age of Greece "was the companion and friend, and, in intellectual intercourse, the peer of its choicest spirits."

Hence, from this evidence we can presume that the relationship in those days had progressed a very long way towards that which exists at the present time in the best type of medicine as practised in our own land, and others equally civilised, where the patient is treated with humanity, skill, and consideration.

The influence of the Greek school permeated the then civilised world, influencing Egyptian, Arabian, Indian, and Roman medicine, and, indeed, a considerable amount of the Grecian method has been preserved for us through these channels, since Grecian society perished about A.D. 700.

When we turn to Rome we find that the early native medical system was devoid of science and was really that of a people of the lower culture, being mainly religious and magical in character, with many minor specialist deities and a multiplicity of temples to house them; so that here we have a system beginning on a low level, about 300 to 400 B.C., but gradually becoming influenced by the higher level of the Greeks, and gradually taking on the more rational aspect as that influence became stronger. It is odd that Rome did not produce many physicians who became famous, and perhaps Celsus (who lived in first century B.C.) is the best known; the writings which he left show a reasonably advanced rational medical system largely based on the Grecian methods, but the more enlightened methods of medicine only appear to have had a vogue in the upper and more enlightened classes—the lower orders continuing to patronise the temple type of magical medicine.

It is interesting, that in matters of public health, the state did much for the people, but this was kept in public administrative hands and was not controlled by medical men. The Romans rather tended to look down on the Greek idea of medicine and thought it rather soft and impractical. Further, we note that the Romans inaugurated state physicians whose duty was largely the care of the poor, this innovation coming about in the later days. A system of state medicine was also present in Greece, so "nothing is new under the sun."

The best aspect of medicine in Rome was the military organisation, where considerable care was given to the serving soldier, both as regards treatment and hygiene; so it would appear that the general standard of doctor-patient relation-

ship was on a lower level in Rome than in Greece, on the average, but was fairly good among the well to do and also in the army.

The Roman civilisation ended about A.D. 1100 and then the black night of medievalism descended on medicine, when magic and priestcraft took control to produce not only stasis, but a retrogression where medicine was concerned.

A few sparks remained, however, and these were kept alive in Arabian medicine, and by this means medicine was brought to Spain by invasion and produced the school of Salerno, where Greek medicine was taught. Linacre studied there and brought this teaching to England in the days of Henry the Eighth. In spite of the few bright and shining names, such as Vesalius and Harvey, who flourished in the sixteenth and seventeenth centuries, medicine still existed under a cloud of ignorance and consisted largely of potions and all sorts of foul concoctions, incantations, amulets, etc., so that many of the so-called physicians were charlatans, quacks, and rogues, who battered on the ignorance of the people, selling spells and potions—the consequent relationship being a very low order indeed and far below that of the Greeks—until scientific medicine dawned in the seventeenth century.

I do not think it helps us much to trace the gradual evolution further of the more generally human approach, combined with the increasing knowledge of mind and body which makes this possible, since the curtain began to uncover the awful gloom of ignorance which covered the more or less civilised world for almost a thousand years, as far as medicine was concerned.

Having tried to see the foundations and gradual changes, it is perhaps interesting to consider some of the factors in the relationship as it exists to-day.

If the doctor of to-day subscribes to the Hippocratic Oath and is, or behaves, in the manner befitting one who “conceives and realises medicine as the profession of a cultivated gentleman” (Osler), a position which we have seen he held in the days of the Greeks, then surely the relationship should and could be kept on the highest level of humanity, with the more cultivated patient paying tribute to a standard similar to his own, and the less cultivated recognising and respecting a standard higher than his own.

It has been said that “A good doctor must be a good man,” and, if he is to keep the respect and affection of his patients, this is generally true: it is possible to be a very skilled and expert doctor and not have either the respect or affection of patients, but surely that is an inhuman and incomplete relationship.

It is fundamental that this relationship should be one between a person who is a patient and a person who is a doctor, rather than one between a patient and a healer, and that is where many junior members of our profession fail—they will not realise that the hospital patient is an individual, but are inclined to think and refer to the patient as a “case” of such and such a disease in bed number so and so, and lose sight of the individual with his many personal troubles and worries, whereas if they would approach the person with his troubles they will find a wider interest, and that was one of the lessons the ancient Greeks learnt about 400 B.C.

“Unless a doctor is able to handle a human situation, however skilful he may be, and full of knowledge purely medical, he will never become a supremely effective medical practitioner” (Brackenbury).

If we were to try and study the psychical side of our patients to anything like the degree to which we study the physical side, we would find a much greater interest and also become much better doctors.

The doctor should always be human and not afraid to show his feelings, of course to a certain degree only, as it is well known that the doctor who feels every pain with his patient will soon find life unbearable, but it is quite possible to feel and be sympathetic towards a patient without suffering oneself in the process. He should also realise and always keep in mind when seeing a patient, either in their own home or in his consulting room or surgery, that what for him is an everyday occurrence, may be one of life's milestones for the patient.

This is perhaps one reason why Irish doctors are usually successful both at home and wherever they go, the little touch of Celtic warmth being appreciated by their own race and by the less demonstrative Saxons.

The doctor should be wise in worldly matters and knowledgeable as regards the ways and conditions of living and working of all conditions of people, in order that he may be the better able to advise as regards circumstances in their way of living, which may require to be modified after the acute stage of their disease is past in order to secure full convalescence, prevent recurrence, and in giving encouragement and advice as to future ways of life.

There must be a mutual loyalty and trust between patient and doctor, producing the necessary co-operation in defeating the common enemy of disease, and each partner should possess the qualities making for this co-operation in order that it should attain the highest level of success.

Tolerance is necessary in the doctor, for we often lose sight of the fact that a patient who is suffering from some complaint is unable to behave in his normal manner, and is inclined to do and say things which he would never think of when in his normal state.

He should be able to show a generosity of mind towards the sick who do not behave as perhaps he might expect, either when they are ill or afterwards; this has been expressed by R. L. Stevenson :—"Generosity, such as is possible in those who practise an Art, never in those who drive a trade, discretion tried by a hundred secrets, tact tried in a thousand embarrassments, herculean cheerfulness, and courage. So that he brings air and cheer into the sick room, and often enough, though not so often as he wishes, brings healing." Patients sometimes show a vindictiveness on recovery and may be inclined to retaliate by indulging in a minor triumph or the casting of a mild reproach in order to try and assert themselves after experiencing the feeling of medical domination in sickness. This has been shown by Hogarth or Goya in the form of caricatures depicting the doctor as an ass, with the caption "Is the patient killed by the disease or the doctor?"

Also in a cartoon by Golzius, with three pictures and the captions :—

- (1) As an Angel when called to the patient's bedside.
- (2) As a God when a cure has been expected.
- (3) As the very Devil himself when presenting his bill !

It is under these conditions that forbearance and generosity are required.

An even balance of mind is necessary when dealing with patients, and, as

Osler has said: "If we had only to deal with one another the difficulties would be slight, but it must be confessed that the practice of medicine among our fellow creatures is often a testy and choleric business. When one has done his best, or when a mistake has arisen through lack of special knowledge, but more particularly when, as so often happens, our heart's best sympathies have been engaged, to be misunderstood by the patient and his friends, to have evil motives imputed, and to be maligned, is too much for human endurance and justifies a righteous indignation.

"Women, our greatest friends and our greatest enemies, are the chief sinners, and while one will exhaust the resources of the language in describing our mistakes and weaknesses, another will laud her pet doctor so indiscriminately that all others come under a sort of oblique condemnation."

In these circumstances it is perhaps a comfort to reflect on the marvellous trust and confidence which is reposed in us by our patients; how they place their bodies and minds, and those of their nearest and dearest, in our hands, and submit to our ministrations, minor and major, without question and often without blame or reproach, if all does not end favourably for the patient.

It is true that a doctor's mistakes, or alleged mistakes, are brought to light of day, but anyone who goes to an unqualified practitioner seldom cares to admit or discuss any mistake, real or imaginary, which could be laid at his door, being ashamed to admit that they had strayed from orthodox medicine.

The general practitioner bears a different relationship to his patients from the specialist, the former having usually known them well personally, and in relation to their normal surroundings, and is the better one to judge of their special requirements in relation to environment, occupation, and the modifications in living conditions desirable after illness. He must be guide, philosopher, and friend, and particularly in the country is this well exemplified, because "a good doctor must be a good man" in the country, where he lives under a much fiercer light of observation and criticism of all his doings, both at work and play, compared to his colleagues in cities and towns.

The general practitioner should have fulness of knowledge over a wide field, whereas a specialist has knowledge of a greater depth over a small area.

The power of a doctor to have his knowledge available when required is of equal importance to its possession, in other words, to know where to find necessary information at short notice.

In the practice of medicine some lack of knowledge or imperfection of skill, some erroneous inference or minor error of judgment has occasionally to be recognised, understood, and forgiven.

The best doctor is the one in whose case these happen most seldom. Bad judgment is not an indictable offence; gross negligence, which is usually unforgivable, is the only one.

It is always well to recognise that the doctor with a high degree of medical knowledge and skill, but who is lacking in sympathy, consideration, knowledge of humanity, and kindness, is frequently less successful than the man who possesses less skill and more humanity, less successful in curing patients, as well as in the purely material sense.

It has been facetiously remarked, but with considerable truth, that the successful doctor comprises one-third "savoir" and two-thirds "savoir faire."

It is also an interesting fact that those doctors who behave towards their patients with courtesy, evenness of temper, and propriety on all occasions and as a matter of habit, seldom are called upon to face accusations of breach of any of these acts of good manners. A recognition of another's limitations is a valuable asset in a doctor, as frequently one finds the most amazing zones of ignorance, particularly in matters to do with medicine in general, and also as regards the working of their own bodies, in people who are otherwise well educated and even cultured, and often we find some misunderstanding arising, the cause of which is quite obscure until we pause and reflect that we may have happened upon one of these blank zones, and a few questions in the light of this possibility will often restore confidence.

A sense of humour is always an asset in the doctor, as by its means what could otherwise be a rather stiff and stilted interview may be turned into a pleasant relationship, from which the icy covering of lack of ease has been removed. It is not well to be too facetious, as the patient may think that the complaint which looms so largely in his mind is not being treated with sufficient gravity and seriousness by the doctor. Similarly, an air of grave solemnity is not desirable, as it is very easy to impose a sense of seriousness about some complaint in a person who is only too ready to believe the worst about himself, considering how he feels.

The grave and serious physician who confines his remarks to a few portentous and solemn "Hum's" and "Ha's," and who either will not, or cannot, give a clear and reasonable description of the patient's condition and its probable course, often leaves an impression that he is afraid to tell the sufferer just how serious his condition really is, and the effect of the interview is to plunge the patient into the depths of despair.

On the other hand, to waive aside the patient's sufferings with an airy optimism, as though it is a mere nothing, is liable to leave in the patient's mind the idea that the physician is a fool and does not realise just how ill he is, when he himself knows what he is suffering.

Hence, it is well to temper the wind and to select one's description and advice to suit the intelligence, knowledge, conditions, and temperament of the person who comes for advice, rather than to advise the ideal treatment for the particular disease from which he is suffering.

It is equally true that one should not say too much and enter into long-winded perorations couched in elaborate technical terms, because the most of this will simply float away above the patient's head and be lost. Let one's words be couched in the language and terms which will be understood most easily by the person who is being addressed, and it is also true that a few minutes spent in making the patient understand exactly what treatment one wishes him to carry out, and, to a certain extent, why, will result in that treatment being carried out effectively and with a cheerful co-operation, which will mean that effective treatment will speed the cure and result in a satisfied and contented patient.

It is amazing sometimes to hear patients repeat statements alleged to have been

made by oneself at a previous interview, knowing full well that not even in one's most aberrant moments were they likely to be made, and usually the more ignorant the patient, the greater the diversity of fact that is reproduced—hence the value of saying less to the ignorant, and in terms that they are able to comprehend. In this connection it is well not to put too much credence on the alleged statements by one's colleagues; as recounted by patients, and equally wise to refrain from comment or criticism of a colleague on these grounds, for in very many instances enquiry will prove the original statement has been so distorted and changed that the final version bears no relation to the original, and one's colleague is suffering from the lack of intelligence and accuracy of the patient, who often in his excited state at a medical interview is unable to remember the proceedings accurately.

To counter this human frailty it is often wise to have a relative present who can, perhaps, remember more accurately the statements, advice, and facts given at a medical consultation.

The doctor who pursues the even tenor of his way and who is civil and courteous to all with whom he comes in contact, from the most humble patient or employee, to the seniors and the great ones, will find the passage through his medical career a relatively easy one, because all these people will take care to try and oil the wheels and remove the obstructions from his path, in return for his simple civility.

A few civil words, a little kindly sympathy, or interest in their personal affairs will often turn into the gold of gratitude which may be returned by patients and staff, or wherever one works, and this respect, help, and kindly feeling often is ample reward to the doctor for any trouble he may have taken in the course of his ordinary duties of healing or administration.

Children are perhaps the most responsive of patients, and it is well when dealing with them to spend a few moments talking to the child itself rather than the parent in order to let the child have time to register its impression of what one is like, and unconsciously or consciously decide just how to react to the subsequent examination. It is often well to describe to them just what you wish to do, and, as a rule, if they assent themselves (rather than letting the parent assent by proxy), they will let one carry out the described procedure. Many children behave much better if the parent can be persuaded to sit to one side and remain silent, taking no part in the procedure, but merely giving confidence by being present.

A sense of humour with children is valuable, and the humour must be graded to suit the age and temperament of each child—a timely joke will often turn tears to smiles where the child patient is concerned. Children are often vain and can easily be distracted or put at ease by the timely admiration expressed about some small possession or article of dress. A wrong atmosphere of suspicion is often engendered by the doctor who asks the child to give him something, or who pretends to remove some possession or toy, and it is often not realised how deep and lasting this impression may be, or the future implications it may have on the relationship between the child and that doctor, or perhaps all doctors, who are apt to be classed with the tactless one in the child's small experience.

Cheerfulness is an especially valuable asset when dealing with children, particularly after their first visit, and indeed it is valuable at all ages during the later

visits; also a certain amount of sympathy is helpful and often much appreciated—a word, a touch, and a smile going a long way to brighten a monotonous time spent in bed, with few outside distractions, and little to see except walls, ceilings, and other sufferers, if the patient is in hospital.

The art of dealing with children includes the gift of approaching each child as if one had known it all its life, an atmosphere of ease and friendliness to which the child responds with a varying degree of celerity by losing its shyness and fear of the unknown, and also to refrain from using such conversation as a child of any age might think suitable for one younger than itself. It is well to talk as “man to man” to a child of any age, and this puts upon them a sense of responsibility, and they will rise to the occasion and treat you similarly, standing on their own feet and not deferring to the adjacent but inactive parent.

A patient of any age who has been put at ease by a little care and thought at the beginning of a medical interview will give more information and submit to more procedures of examination than one who is nervous and ill at ease, and also will permit of the more difficult manipulations of treatment, even if painful, without undue protest, and the doctor who has the gift of being able to size up a personality quickly is able to so arrange his methods of examination and treatment that they will vary with the psychological requirements of each individual patient, to the mutual satisfaction of both healer and healed.

The gift of being able to assess a personality is not given to everyone who practises medicine, but a great deal of this art can be acquired by practice and experience in the study of each patient. A great deal can be learned by conversing with the patient in taking the history; his education, speech, accent, and intelligence can often be judged in a few words and yield much information.

An inspection of the patient, his gait, appearance, colour, carriage, clothes, defects or deformities, bodily build, and mannerisms may help one to diagnose his complaint, or even permit one to diagnose accurately before examination.

A brief study of his hands is a great help, as one may learn much from their shape, either natural or modified by occupation, injury, or disease.

In this connection a knowledge of the different types of hand will often help one to pick out people who possess different types of mentality, occupation, and interest, and enable one to adapt one's subsequent examination, treatment, and advice to the particular needs of the individual.

A great deal of help can often be obtained from a knowledge of the different occupations, and it is valuable to see as many different types of occupation as possible being carried out, so that one may know the particular mentality required, as well as the conditions and hazards that each entails.

An enquiry into the patient's hobbies and interests may often give a clue as to the particular type of personality with which one is dealing, and may provide valuable clues in the future management of the patient's own peculiar problems.

You may smile when the sense of smell is mentioned, but it is well known that sufferers from certain diseases have a definite odour, and this often gives a very useful clue during examination. It is hardly necessary to discuss here the information gained in the course of a physical examination, as that is one of the main

reasons why one attends hospital, but always remember that gentleness and consideration for the feelings of the patient, both physical and mental, will truly bring their own reward, both for your own satisfaction and that of the patient—be he pauper or prince.

We are inclined to think that we have perhaps reached the last word in humanity towards our patients in this corner of the Empire, or, at any rate, in Great Britain, but travel abroad can be very humiliating and an excellent corrective to parochialism, as some of those of us who went to the Continent last summer found in our search for ideas which might be incorporated in the plans for the alterations and extensions in this Hospital Group; indeed some of the ideas are being used already.

We were able to see the natural evolution of ideas in countries which had not been at war, and consequently found them far ahead in organisation and construction; also in occupied countries where they were not so far ahead; and in this country where progress in construction and organisation had been slowed down or stopped by war conditions, we were aware of many of our own shortcomings, but it was interesting to see how these had been remedied elsewhere.

We were greatly impressed by the thought which had been given to the planning of hospitals, where the welfare and comfort of the patient was the focal point around which the design and organisation were planned.

It was interesting and comforting to see state medical services working, for the most part, efficiently—I will not say quite smoothly, as they have their troubles elsewhere—but these are perhaps the cutting of wisdom teeth, whereas here we are very much cutting our milk teeth, and I expect they will take some time to reach their full functional value.

State medical service may be very new to us, and, as with any new thing all down the ages, subject to criticism and distrust, but when one thinks of all the new things and ideas to which we have had to be accustomed in the last thirty years, and which to-day are accepted as parts of our every-day life, I have no doubt that in time modifications and changes will cause the wheels to run smoothly and efficiently, and also I see no reason why because in future we are employed by the State there should be any alteration in our relationships with our patients, but rather that we should continue to practise our art in the Hippocratic tradition and do our best to improve upon it.

The Country Surgeon

By J. G. JOHNSTON, M.C., M.D., J.P.

Presidential Address to the Northern Ireland Branch of the British Medical Association, 21st October, 1948

I am fully aware of the very great honour done me by my election as President of the Northern Ireland Branch of the British Medical Association, but, at the same time, I am acutely conscious of my inability to fill that position in the manner to which you have been accustomed.

For the past twelve months I have been attending meetings of Branch Council, etc., endeavouring to learn my job under the able chairmanship of your past President, Mr. Ian McClure, and each time I have envied him more and more :— (1) His marvellous knowledge of medical affairs in all branches of the profession; (2) his ability to sum up a situation or a wandering speech; (3) his remarkable energy and control; and (4) his power to get a maximum of work done in a minimum of time.

I will endeavour to follow in his footsteps, but I fear the standard and pace set by him, and I may lag far behind. I trust, therefore, you will bear with me in my shortcomings, knowing that I am only a very lesser star in the medical constellation.

Now, this great honour of being your President is not altogether an unmixed blessing, and I owe my present embarrassed position mainly to listening to the blarney of one whom I had thought to be one of my oldest and best friends—Dr. George Lyttle. It was he who told me of my nomination, and, on my anxious enquiry, informed me that he did not think it was necessary to read a paper. Later reference, however, to the secretary, Dr. Fred Halliday, soon dispelled this spot of sunshine, and I was committed.

Your list of Past Presidents contains the names of many men eminent in some specialised branch of professional work, and many more, less eminent, perhaps, but who have gained the confidence and respect of their colleagues simply through their devotion to their chosen life's work. The age incidence is far from constant; some attain to the honour quite early in middle life; others not until verging on their dotage. For example, last year I remember at this meeting Mr. McClure was able to introduce himself as one of the youngest, if not *the* youngest President ever elected. This year the pendulum has swung rather, and I am afraid I am quite unable to make any such claim. Indeed, if there was likely to be any material advantage—a pension for instance, or, as it is now more kindly called, a retiring allowance, I might be tempted to be more specific and stake my claim at or near to the opposite pole.

Now what on earth was I to talk to you about? And, believe me, Ladies and gentlemen, the answer to that question has worried me quite a bit.

I have no speciality to put before you; no research work to whet your curiosity; and, while the reminiscences of my earlier years might be amusing, they would certainly not be of any educative value, and might well be out of place in the heavy atmosphere of a medical meeting. In discussing this problem with one of my colleagues, he facetiously suggested a paper on Gilbert and Sullivan as applied to Medicine. Well, just at this moment, I wish I had the gift of words and wit of a Gilbert and the harmony and rhythm of a Sullivan.

“My object all sublime, I should achieve in time.

To make the punishment fit the crime . . .” And I might even . . .

“Make a little list of those who never would be missed.”

Most of you could lend me a hand with this!

After much thought, I finally decided that I should do something to throw a spotlight, if only for a few minutes this evening, on the work of a devoted body of men who toiled, often in poor surroundings, with inadequate equipment, and under many other disadvantages, for many years and with small reward, so I chose for my title:

THE COUNTRY SURGEON

I was fortunate in my life and career to have known a number of these men, and to one or two of them I owe a great deal. My experience of their work extends over a period of forty years, and so any names I mention will probably only be remembered by the most senior of our members. Each county seemed to produce a man outstanding in ability or initiative, or both, and so we have such household names as . . . St. George of Lisburn, Darling of Lurgan, Kidd of Enniskillen, Tate of Downpatrick, Thompson of Omagh, and Palmer of Armagh.

These men have now all gone to their reward, but the record of their work still lives with those who have succeeded to their posts and with those who have benefited by their ministrations.

With one exception, they were surgeons to a County Infirmary, and with two exceptions, they were unqualified to hold such posts, if judged by present-day standards. Nevertheless, I will endeavour to show that they did good work, and, perhaps best of all, that they formed the nidus from which the present magnificent service of country hospitals and country surgery has been developed and is still expanding.

The earliest hospital system of which I can find any record is the Institution of County Infirmaries in Ireland—one for each county; though, strangely enough, two were omitted—the Counties of Dublin and Waterford. Whether this was done by accident or design we do not know, but probably by accident, as later the Meath Hospital in Dublin was designated the Infirmary for that county, and later still, the Leper Hospital of St. John became, by special Act of Parliament, the County Infirmary of Waterford.

These County Infirmaries had their origin in an Act of the Irish Parliament passed in 1765. A Corporation was thereby constituted for the purpose of erecting and establishing public infirmaries or hospitals in the counties: in the county towns or at a distance not exceeding one mile from the County Courthouse, except in

the cases of Antrim, Cork, Donegal, Kildare, Mayo, Meath, and Tipperary, in which counties other localities were specified. By the same statute, every donor of not less than twenty guineas was made a member of the Body Corporate for life, and every subscriber of not less than three guineas, a member for one year. This Body Corporate was to have perpetual succession and a common seal, and be called the Governors, and was entitled to take and receive lands, gifts, grants, and contributions for the sole use of the infirmary. Thus many of the infirmaries were richly endowed by the founders, according to the standards at that time.

The surgeon's salary was not to exceed £100 per annum, to be paid half-yearly out of the public money. This sum, I am given to understand, was the equivalent of £94 Irish currency, and so to this day some of us receive, once every six months, from our respective County Councils a cheque for £47, as a token of their faithful fulfilment of a law passed some one hundred and eighty years ago. The surgeon was to live at or within one mile of the infirmary, and, in some counties, e.g., Armagh and Down, this was regarded as an instruction to build an infirmary house or residence.

The Grand Jury were obliged to raise a yearly sum not exceeding £100 nor less than £50 as a county charge, for the provision of food, medicine, and the general upkeep of the hospital.

The county infirmaries were built by funds entirely provided by voluntary subscription, and, except for the assistance referred to, were maintained by charity for some years after their foundation. After a time, however, the income derived from charity was found to be insufficient, and in 1805 the Grand Jury was given power to levy an additional county charge not exceeding £500, making a total of £600 in the year for the support and maintenance of the infirmary, which thus gradually passed from being a voluntarily supported institution to being largely a rate-aided one. By the Grand Jury Act of 1836, the county charge for maintenance and support was increased to a maximum of £1,400 per annum, and remained at this figure, in spite of the greatly increased cost of living, until 1923, when the Northern Ireland Local Government Act removed the financial restrictions. But no provision was made out of the county rates to meet the cost of extensions, improvement, or equipment to keep abreast of the times. All these were left to charity.

When the Local Government Act of 1898 was being drafted it was proposed to do away with the County Infirmaries, but the Chief Secretary for Ireland, Mr. A. J. Balfour, was approached, and a compromise was arranged whereby the county infirmaries, after valuation, were handed over as a free gift to the County Councils, on condition they maintained them: the maximum grant of £1,400 was still imposed, a joint Committee of Management formed, and so it is to this day . . . or was until 5th July.

It would be difficult for us, cradled in our beautifully-equipped modern hospitals, to picture what the county infirmaries were like in their early days, and a few extracts from their very early history might be enlightening. For example, Derry Infirmary was used as a fever hospital, and, until 1828, was also described as a refuge for the insane. The hospital surgeon was compelled to act as surgeon to the prison, without fee or reward, but he was also by right of office a Freeman

of the City of Derry. In 1845 we have record of a notice to patients "not to throw their dirty poultice cloths out of the windows," and in 1820 a patient was put on bread and water for three days for disobeying an order of the Board. Try that to-day and see what the Union will say or do!

From Down County Infirmary we have a diet sheet dated 1767 which hospital dietiticians might be interested in, as might also be those who are mainly occupied and often sorely worried by the treatment of gastric and duodenal ulcers.

TABLE OF DIET

Flesh-meat days shall be Sunday, Tuesday, and Thursday.

FOR BREAKFAST.—Water Oatmeal Pottage, one pint, with a pint of milk or small beer, or a pint of Milk Pottage without sauce.

DINNER.—Eight ounces of Beef or Mutton or Pork or Veal, weighed when raw, for each patient. Either of these to be boiled and broth made of it, thickened with Cuttings or Grotts, a pint of which to be served to each. Roots are to be used when to be procured, as Potatoes, Turnips, or Parsnips. When there are Roots, six ounces of bread, and eight ounces when otherwise. A pint of small beer, when to be had conveniently.

SUPPER.—Water Pottage, a pint, or a pint of Flummery or Potatoes. With either of these, a pint of milk occasionally, a pint of Milk Pottage, or six ounces of bread and a pint of milk.

Meager days shall be Monday, Wednesday, Friday and Saturday. Breakfast and Supper the same as on Sunday, Tuesday, and Thursday.

DINNER

- (1) Ten ounces of bread and a pint of milk, *or*
- (2) Twelve ounces of plain pudding, one ounce of butter and a pint of small beer, *or*
- (3) A sufficiency of potatoes and one pint of milk, *or*
- (4) Ten ounces of bread, two ounces of butter and a pint of small beer, *or*
- (5) Three ounces of skimmed milk cheese, eight ounces of bread, and a pint of small beer, *or*
- (6) One quart of broth, made the day before, and four ounces of bread, *or*
- (7) A quart of grott gruel, or barley seasoned with salt and butter, and four ounces of bread.

There lived in Lisburn in the early 1800's a Mr. William Thompson, M.D., F.R.C.S.I., who was surgeon to the County Antrim Infirmary for almost fifty

years. He reversed the present order of prestige in that he had consulting rooms in Belfast and attended there daily. That this was a very successful and lucrative practice is evidenced by the fact that we have in Lisburn to-day the Thompson Memorial Home for Incurables, built by his relatives after his tragic death. He was killed at Dunmurry crossing the railway in 1882, when 76 years of age.

My predecessor in the County Antrim Infirmary gives us an interesting, if lurid, account of that hospital when he was appointed to it in 1882, after Mr. Thompson's death. He says :—

“The staff consisted of a matron who was not a trained nurse, two nurses, neither of whom could either read or write and who had received no training whatever, and a porter. There was no night nursing at all. One of the nurses occupied a bed in the female ward, and the porter slept in one of the male wards. The dispensary was the abode of very large black and grey slugs and cockroaches, and the yard was infested with rats. There was one bathroom, with the bath sunk in the stone-flagged floor and seldom, if ever, used. Behind the hospital were the pig-styes, from which a stream of sewage found its way down the yard, and flies were plentiful.

“The operating room had a wooden table and a wooden press holding instruments, and at each end a human skeleton. In the wards there was no ventilation, except when the windows were open, which was seldom. The beds were iron, and the mattresses straw stuffed into ticks. Plates were wooden, and knives and forks were not provided. There were no washbasins and taps, and vermin were plentiful, especially bugs.” In this year he records that there were forty operations performed, with four deaths, perhaps not too bad a result under the conditions prevailing.

In 1885 the first attempts at modernisation were made, viz., the building of extensive bathrooms and lavatory accommodation.

In 1887 a trained nurse was appointed as matron and nurses were instituted in place of the attendants on the sick, as previously. Also in the same year the change of the mattresses from straw to wire-woven was of great advantage, rendering the wards cleaner and the air purer, as the debris of the straw when the beds were made floated about in the air. He advocated, however, that thin hair mattresses over the wire ones would be of service, as the wire was rather cold to lie on in the winter.

In 1893 we have reported :—The amount of stimulants used during the year was four and a half gallons of whisky, thirty-nine dozen of stout, and a gallon of gin. No wonder the man and the place were popular !

In 1896 a horse ambulance was provided by public subscription in the town for the removal of sick people and accident cases to the hospital.

In 1904 electric light was provided by means of a petrol-driven engine and dynamo, and the first X-ray plant was presented to the hospital by the Barbour family. This was a small machine that made a terrific noise : there was a visible spark of some six to twelve inches, and, although I was present at its use on several occasions, I must confess its workings were a complete mystery to me and I was terrorised by this exhibition of intern thunder and lightning.

In 1912 a new operating theatre and sterilising room were built and an electric lift installed, and so, gradually, we see a comparatively modern hospital with most of the amenities for up-to-date treatment evolved from this primitive house of discomforts, insects, and dirt, within the lifetime of one individual.

We are now approaching the era of Poor Law and Hospital Reform in Ireland, and it is remarkable that these included in their efforts a desire to cripple or damage the county infirmaries.

In 1925 the Secretary of the Northern Ireland Local Government Commission wrote to the infirmaries, stating :—"Various suggestions have been received alleging that county infirmaries are unnecessary, and that a system of district hospitals equipped with up-to-date apparatus would more adequately suit the needs of the country." This led to a variety of suggestions, and, after much controversy, it was finally arranged that county infirmaries were to remain, and, where the building, etc. was suitable, they were to be enlarged and equipped as the central hospital and be supplemented by the conversion of several selected Union infirmaries into district hospitals.

In my opinion, the credit of making this revolutionary change, or, at any rate, for making the idea of it a possibility, must go to Dr. Darling of Lurgan. He was doing major surgery, and good surgery, in his Union infirmary long before it became the modern, up-to-date, and well-staffed hospital of to-day. Ballymena was also early off the mark with the building of the Waveney Hospital, which served as an auxiliary military hospital from 1915-1919 and then became a district hospital with about one hundred and fifty beds. The Union infirmaries at Antrim, Lisburn, Larne, Ballycastle, and Newtownards were soon undergoing drastic alterations, and, later, those of Banbridge, Ballymoney, Kilkeel, and Magherafelt.

It is now common knowledge how this chain of district hospitals has been brought into the scheme of things, and the magnificent work that is being carried on in them, giving the lie to a prophecy made by my old friend and teacher, Professor Fullerton, that these district hospitals would give rise to a large number of very poor surgeons. Even one of his eminence could not see twenty years ahead, nor envisage the evolution of our old prison workhouses into the bright, cheerful hospitals of to-day. And he would be the first to admit the ability, attainments, and the splendid results achieved by the men who staff them.

I do not propose to weary you with a long list of figures or bore you with statistics, but the increased use of country hospitals, and especially of their surgical units, can best be shown by a brief summary of figures over a selected number of years.

I do not pretend that this is a complete record of all work done outside Belfast in these years. I contacted most hospitals in the Six Counties, and to their medical officers I am deeply indebted for the loan of old reports and articles of special interest about their own hospitals. Some did not publish reports and records were not readily available, and a few seemed to mistrust the use to which I might put any information received. However, the figures quoted will give a comparison that speaks for itself.

In 1910, 3,298 patients were admitted to country hospitals in Ulster and 1,252 operations were performed. At this time, you must remember, the only hospitals which were doing surgical work were the six county infirmaries, with an average of under sixty beds each.

In 1920 the number of admissions had risen to 4,877 and the number of operations performed to 2,016.

By 1930 the influence of the district hospitals and the increase in the number of beds available is being felt, and we have 9,165 admissions, with 4,418 operations.

In 1940, with still more beds available, admissions are 17,639 and operations 8,243, whilst in 1947, the last year of available statistics, admissions are up to 24,092 and 12,669 operations were performed.

Ladies and Gentlemen, I make no apology for my subject. The bringing up to date and filling in of one's historical background, however sketchy, is a necessary and practical service to any profession. Medical service has had its day of small things, one that gives us both pride and pain to recall. Indeed, in these matters, the student and young graduate of to-day scarcely realises how fortunate he is. Spending, as he does, some years amid the magnificence of our City hospitals—equipped, regardless of expense, with the very latest of everything and staffed with the cream of our profession—he must find it extremely difficult to visualise a hospital such as I have earlier described, or the problems that beset a doctor in fighting disease in such conditions and surroundings.

So far as our profession is concerned, we are at present passing through a great, new, transitional stage. The bad, old, poorly-equipped days are happily gone. But we would not wish them to pass completely from sight without recalling for a moment the heroic figures who did duty in those days, or without acknowledging the great and good work that they accomplished. Most of them were big men, featuring life physically at its best and radiating everywhere and always a herculean cheerfulness. In saying this, I hope you will not judge me of allowing my hero-worshipping tendency to outrun my reason. For if such a reception were forthcoming, I could not better defend my opinions than by pointing out that if the country doctor will henceforth work in a hospital second only to those of the city, and the country patient enjoys a service that compares favourably with that of his city contemporary, a large measure of the credit for these reforms is due to these pioneer surgeons, who, starting from well behind scratch and within a time space of forty or fifty years, succeeded in the face of many difficulties in modernising the buildings and in equipping and staffing them according to the standards acceptable to these modern times. Yes, they indeed served well their times, and that not only in duties appertaining to their own profession, but in supporting and influencing everything that made for the good of the population among whom they resided. We, therefore, metaphorically, raise our hats to this brave band of country surgeons who blazed well the trail of our profession in this country, who enriched the stream of public life and well-being, and who set up a standard of social service that future generations may deem it well to emulate, but will find it hard ever to excel.

For this reason, let this be their epitaph :—

The Doctor sleeps. No more at pain's behest
Shall he relinquish his much-needed rest,
No more his skilful hand and tender heart
Shall give to some new life a proper start.

The Doctor sleeps. His fighting days are done,
But hundreds live because of bouts he won,
And, generations hence, those will draw breath
Who would not Be had he not vanquished Death.

The Doctor sleeps. Might we his deeds recall
His name would blaze in Fame's enmarbled Hall,
But, serving modestly through life, it now seems best
To merely write, "His work survives," and let him rest.

REVIEWS

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This book, with its sound and progressive outlook, is a very distinguished addition to the literature on this subject. It will be of great value to all medical practitioners, and especially to pediatricians and to those whose work lies largely in the field of tuberculosis. A. L.

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For this reason, let this be their epitaph :—

The Doctor sleeps. No more at pain's behest
Shall he relinquish his much-needed rest,
No more his skilful hand and tender heart
Shall give to some new life a proper start.

The Doctor sleeps. His fighting days are done,
But hundreds live because of bouts he won,
And, generations hence, those will draw breath
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The Nutrition of Infants and Young Children

By GEOFFREY H. BOURNE, D.PHIL., D.SC.

London Hospital Medical College

An address to the Ulster Medical Society, 22nd April, 1948

Given under the auspices of the Ministry of Food.

THE last fifty years have seen a profound change in the views held on the feeding of infants. Many years ago Sir Robert Hutchison is reported¹ as having said that he would "undertake to teach a baby to eat beefsteak." His audience laughed at this statement. Now, as Dr. Helen Mackay¹ has pointed out, the tendency is to train babies to eat beefsteaks from about six months onwards—though the beefsteaks are usually minced or shredded so as not to overload the infant's digestive system. There is no certainty as to when, physiologically speaking, it is best to start an infant on solid foods. There is no consistency amongst native races in the time at which they do this, or when they start and finish weaning, and it seems that one of the disadvantages of the large cerebral development of humans is that it has led them more and more to do un-natural things, and the actions even of native races, which might be expected to live close to nature, are conditioned by taboos, religious traditions, and other products of human thought. What of the great apes—which come at least zoologically close to man? Here we are troubled by a sparsity of scientific information. However, hearsay evidence suggests that baby apes, even within a week or two of birth, pick at the foodstuffs their mothers eat, and it seems, therefore, that they supplement their milk diet very early in life.

The nutrition of infants really begins from the start of pregnancy. While the mother's nutritional reserves are usually adequate to meet the embryonic demands of the first few months, in the latter part of pregnancy proper nutrition of the mother is of very much greater importance, for it is in the last three months of pregnancy that the embryo lays down seventy per cent. of its total birth-weight, two-thirds of its calcium phosphate, three-quarters of its protein, four-fifths of its iron, and over ninety per cent of its fat.² At the same time the mother is enlarging her uterus by laying down additional muscle and by building up tissue stores in her body.² Although I have stressed the nutritional significance of the last three months of pregnancy, one must realise that the nutritional state of the mother in the early period can be of vital importance to the embryo. There seems reasonable evidence now that a mal-nourished mother is more likely to have miscarriages, although whether this can be laid at the door of any specific vitamin deficiency, such, for example, as vitamin E, it is difficult to say. It is more likely that a general sub-nutritional condition may be at least partly responsible for such an event. It is possible too that dietary deficiencies may be concerned with irregu-

larities of implantation of the fertilized ovum, on the proper development of the placenta, and so on, but on these problems we have no certain knowledge.

The growth of the foetus is more rapid than the growth of the child after birth and its high metabolic rate enables it to compete successfully with the tissues of its mother for nutrients. Hence, if these nutrients are not provided in the diet, the foetus will deprive the mother's own tissues of them. She will lose weight and may produce her child prematurely, although one must not lay all premature children at the door of mal-nourishment. If the mother's diet is seriously deficient the baby is likely to be underweight. Such lack of weight may only be made up after birth by prolonged supplementary feeding.² It has been shown that such underweight premature children may take four years to attain normal weight, even with ample supplements during this period.³

It is surprising how many mothers who appear grossly undernourished can produce what appears to be a normal baby, but although superficially normal, such babies are invariably underweight and lacking in vigour, and they attain normal weight and vigour only after a long time. The mother, too, in such cases, suffers a very considerable physiological drain. She can rarely feed the child and her capacity for further reproduction may be affected.

While it is not possible to go into full details of the nutritional requirements of pregnancy, note might be taken of some of the nutrients required. Firstly—protein. Protein is necessary for a variety of reasons, amongst which may be included the provision of material for the increased musculature of the uterus of the mother and for the building of the body of the embryo. Since both these processes reach their height during the last three months it is obvious that at those times the overall protein intake is important, although protein quality is perhaps more important than quantity during the early stages.

Without an adequate protein intake a baby will not reach its optimum birth size. It is possible to reduce the size of a baby by reducing protein consumption during the last three months of pregnancy, but there seems little justification for doing this in the case of a normal healthy mother, although it is defensible in the case say of a mother with a contracted pelvis or other anatomical abnormality. There are two reasons why protein should not be reduced or kept at a low level. The first is that a low protein intake means an ill-developed uterine musculature of low tone which is liable to prolong and complicate the labour, and the second is that a baby artificially restricted in size in this way will have a poor birth vigour, and upon its birth vigour depends its power of survival. Both Alick Bourne⁴ and Hammond⁵ have pointed out that the main factor which decides the birth-weight of child in both man and animals is the size of the mother, and that however much protein a small mother may eat, the birth-size of the infant will not exceed that which is hereditarily determined by her. Alick Bourne has stressed unequivocally that infantile birth vigour is more important for survival than birth-weight and that feeding during pregnancy should (except in special exceptions) be directed towards the attainment of maximum vigour, irrespective of what the ultimate birth-weight should be. He has listed⁴ the points which he says represent the accumulated experience of those who have watched infant progress:—

1. A baby below 5 lb. is slow in gaining weight after birth. A 3 lb. baby takes six weeks to get to 4 to 4½ lb.

2. A baby of 5 lb. reaches normal stature in four to five years. Babies under 4 lb. are always small.

3. A post-natal loss of 6 to 8 oz. is to be expected in normal full-term children and is not affected by extra feeding (this probably represents a physiological adjustment of the infant to its altered environment, involving maintenance of its own body temperature, and so on).

4. Small women tend to have small babies. A 5 lb. mature baby of a small woman thrives better than a 5 lb. baby of a big woman. A 5 lb. baby born at term thrives better than a 5 lb. baby born at thirty-six weeks.

5. Very young adolescent mothers have babies of normal weight despite metabolic competition.

6. Overweight children lose more weight post-natally (12 to 18 oz.) and are slower in regaining it than normal ones, but after six months they tend to grow bigger. The most desirable birth-weight seems to be about 7 to 8 lb.

Iron.—The expectant mother's need for iron during the last three months of pregnancy is considerable. Added to her own normal requirement of 10 to 15 mg. is the amount necessary for the building up of the infant's own hæmaglobin and that needed for storage in its liver. Upon the latter store the child, when born, draws, until such time as it receives iron-containing foods. The infant's stores of iron should be sufficient to last it for five or six months. In actual fact, if the mother is given large doses of iron in the last three months of her pregnancy, the infant could probably last the best part of a year on a milk diet alone without signs of anæmia. In practice it is desirable to give some iron supplement by four months. Davidson⁶ and his co-workers have shown that forty-one per cent. of infants under two years of age in Aberdeen suffered from anæmia. Of three hundred infants in another town, which were regarded by their mothers as being in normal health, twenty-six per cent. of the breast fed and thirty-five per cent. of the artificially fed gave hæmaglobin values ten per cent. below standard.

Iron can be administered as ferrous sulphate or as iron and ammonium citrate, or, alternatively, iron-rich foods may be given. The iron of egg yolk is "available," but it should be remembered that the whole of one egg yolk provides only 0.5 mg. of iron. The iron of spinach is over-rated. Not only is it no more in amount than in other green vegetables, but it is poorly utilized. Most green vegetable purées provide an appreciable supplement of iron. Liver purée needs, of course, no recommendation from me. The old-fashioned black treacle—described in other countries as "molasses"—is a potent source of iron, derived mainly from the iron pots in which it is concentrated. Some American pædiatricians recommend that milk feeds should be made up with molasses as a source of sugar instead of the highly-refined white sugar which is normally used.

Something must also be said on the subject of the calcium and phosphorus

intake of the expectant mother. The old story of "a tooth for every child" need never be true nowadays. One of the reasons for recommending an expectant mother to drink a quart of milk a day is to ensure adequate calcium and phosphorus intake. I wonder, however, if any expectant mothers ever do drink a quart of milk a day—particularly in later stages of pregnancy—or even if they are *capable* of drinking such a volume. Unless they do, however, they would experience some difficulty in meeting their calcium requirements in the last few months. There is much to be said for recommending an expectant mother to take as much milk as she can comfortably manage and then to give her a calcium tablet. Calcium lactate tablets are usually prescribed. I prefer those, however, which contain calcium and phosphorus in physiological proportions: they can be obtained commercially, attractively flavoured and sweetened; the mother can thus take them as a sweet. Not less than one gram of calcium should be advised, preferably more. Extreme deficiency of calcium can have not only a destructive effect on the teeth, but also can cause osteoporosis and foetal rickets.

A high vitamin intake in pregnancy is desirable. Deficiency of vitamin D may cause the same changes as deficiency of calcium. Lack of vitamin B₁ may cause neuritic pains, muscular cramps, irritability, lassitude, and foetal death. The last may be the end result of a deficiency of any of the vitamins, if severe enough. There is now adequate evidence that vitamin C is intimately concerned with the formation of both soft tissues and the organic part of hard tissues, and is obvious there that an adequate intake of vitamin C is essential. More debatable is the requirement for vitamin E. There is no direct evidence that vitamin E is essential for human reproduction, but there is some statistical evidence that its use reduces the number of still-births.

That proper feeding does affect the infantile mortality rate has been suspected for some time. In Australia, where the general nutritional level is higher than in Great Britain, the infant mortality rate was, particularly before the war, very much less, and it was only a third of that of badly-fed countries like Japan, India, Egypt, etc.

In 1937, 1938, and 1939 the National Birthday Trust Fund⁷ carried out an experiment in the Rhondda Valley and the north of England on the effect of improving the diet during pregnancy on the infantile mortality rate. The improvement in the diet consisted chiefly in the addition of 240 i.u. of vitamin B₁, 13,500 i.u. of vitamin A, and 2,250 i.u. of vitamin D, mainly in the last three weeks of pregnancy, and in some cases for three weeks after delivery. During the experiment records of the births and deaths of the offspring of 36,000 women were kept; 25,000 of these were living on what was for them a normal diet and the other 11,000 were given the supplement mentioned above. The groups were more or less similar as far as housing, medical attention, and other factors were concerned. At the conclusion of the experiment it was found that the infantile mortality rate of the supplemented group was 58 per 1,000, whereas that of the control group was 85 per 1,000. Some statistical criticism has been made of this work, but even if we judge these results very conservatively, I feel we are still entitled to claim that they represent a very valuable pointer.

In view of the stress which has often been laid on the importance of breast feeding, it is of interest therefore to know to what extent lactation is dependent upon diet. There is some evidence from animal experimentation that a close connection exists between the two, but in 1941 Ebbs, Tisdall, and Scott⁸ carried out some human experiments in Toronto designed to test this and other problems. Three groups of women were used for this experiment. First, a group whose normal diet was very poor, secondly, a similar group whose diet was nutritionally supplemented, and thirdly, a group which were encouraged by advice and instruction to eat a nutritionally superior diet which was within their means. The results were enlightening. Lactation was good in 42 per cent. of the first group, 52 per cent. of the second group, and 49 per cent. of the third group. General condition of the baby during the first two weeks was good in 62.3 per cent. of the first group, 90.5 per cent. of the supplemented group, and 72.2 per cent. of the third group. Here again we see the beneficial effect of the supplement on the well-being of the child and also on the normal physiological functioning of the mother. We see, too, that immediate improvement can be effected by actually providing the mother with the supplements and that less valuable results can be obtained by giving advice only. The obvious course to improve maternal and child welfare thus seems to be, from this experiment, to give supplements to obtain an immediate result, and to give advice and demonstrations with the object of educating the mother in the way things should go. The problem of education in diet is, however, a very vexed one: not only has the mother to be converted, but two difficulties present themselves in the form of the "recalcitrant" and/or "know-all" father and the "interfering neighbour." A further piece of evidence of the value of proper feeding to normal birth is that obtained in Glasgow in 1942,⁹ when it was found that the diet of three hundred mothers having full-term children was, on the average, better than those with premature and still-born children.

My remarks to date have dealt largely with the nutrition of the infant via its mother. I must now consider in the time that remains the problem of feeding of the infant when it is born. Here we come immediately upon the problem of whether the child should be fed on the breast or whether it is to be a bottle-fed baby. While the tendency is in many quarters to diminish the importance of breast feeding, a very considerable body of informed opinion still rates it very highly. The advantages of breast feeding may be listed as follows:—

1. *Colostrum*.—The content of nutrients in colostrum is less than in the later human milk. There is a progressive increase in the nutrients until the normal concentration is reached. Since the infant at birth has not previously used its digestive system, we are entitled, perhaps, to assume that the colostrum is easier for it to digest than full-strength milk and that its gradual increase in concentration serves to educate the infant's digestive tract to take the higher concentration of nutrients found in normal human milk.

2. *Biological value of the protein*.—The protein of human milk is more economically converted into human flesh than is the protein of cow's milk. There is, for example, thirty per cent. more tryptophane in human milk and three times as much cystine¹⁰. It is of interest that the protein content of milk seems to be related to

the time taken for the offspring to double its birth-weight. Bunge¹¹ has published the following table :—

		PER CENT. PROTEIN	DAYS
Man	-	- 1.6	180
Cow	-	- 3.8	70
Horse	-	- 2.7	60
Sheep	-	- 5.4	35
Goat	-	- 3.7	22
Pig	-	- 6.0	14
Dog	-	- 7.5	9
Guinea Pig	-	- 5.0	7
Rabbit	-	- 14.0	6
Rat	-	- 12.0	6
Pigeon Crop Milk	-	- 13.0	2

3. *Fat*.—It appears that certain unsaturated fatty acids may play a part in human diet. Human milk has seven per cent. linoleic acid,¹⁰ whereas cow's milk has virtually none. This may be significant.

4. *Vitamins*.—There is not much difference between the vitamin A value of cow's milk and human milk.

The vitamin D content of human milk varies between 0.4 and 10 international units and cow's milk between 0.5 and 40, so there may be some advantage in this respect; however, I shall have more to say with reference to vitamin D later.

There are considerable differences in the amounts of the various members of the vitamin B complex of cow's and human milk, as the following table shows.¹⁰

	HUMAN MILK (Micrograms per 100 ml.)	COW'S MILK (Micrograms per 100 ml.)
Vitamin B ₁	- 14	38
Riboflavin	- 37	200
Nicotinic Acid	- 183	85
Pantothenic Acid	- 246	350
Pyridoxin	- 4	67
Biotin	- 0.8	3
Inositol	- 33,000	18,000
Folic Acid	- 45	5

The very different proportions of these vitamins may reflect differences in requirement for them on the part of infants and calves. Perhaps there is a suitable balance of the members of the B complex which is most desirable for a particular species of animal. Platt and Moncrieff¹⁰ are impressed with the possibility of a general balance of nutrients in human milk, and say :—

“Evidence is accumulating of the great importance of a proper balance of nutrients in the diet for optimal digestion, absorption, and utilization; for example, the importance of amino-acids for absorption of calcium and possibly also of phosphorus, of phosphate for absorption of carbohydrates and possibly of fats, of vitamin D for absorption of calcium and phosphorus, and of the inter-relationship

of the absorption of iron and calcium. The effect of lactose on the nutritive value of fats, and possibly in other connections . . . There is no doubt, too, of the superior nutritive value of dietary proteins having an amino-acid composition matched to the body's needs. All this evidence points to the need for as great a concern about the balance of nutrients in the infant's food as of the actual amount of any one nutrient."

Another vitamin in which human milk is superior to cow's milk is vitamin C. Fresh cow's milk contains only 2 mg. of vitamin C per 100 ml., whereas human milk contains 5 mg. per 100 ml. In the first period of lactation it may be higher than this and the amount present throughout lactation varies with the mother's diet. The difference in vitamins is, on the average, in favour of human milk.

5. *Minerals*.—Cow's milk contains very much more calcium than human milk (120 mg. per 100 ml. compared with about 30 mg. per 100 ml.). There is an even greater disproportion in the amount of phosphorus (90 mg. per 100 ml. compared with 15 mg.). However, it appears that the calcium and phosphorus content of human milk is adequate for the infant's needs.

Human milk has three times as much iron as cow's milk, but even so it only amounts to 1 mg. per 100 ml. There is also much more copper in human milk, an important fact when one realises the significance of copper in the utilization of iron. As far as minerals are concerned, therefore, there is a balance in favour of human milk.

6. *Lack of Infection*.—Before the middle of the eighteenth century nearly all artificially-fed babies died.¹² Even to-day, Spence,¹³ in a recent study of infant deaths in Newcastle, found that of ninety-three infants which died from infections of various kinds, eighty-two per cent. were bottle fed and only eighteen per cent. were breast fed. The danger of infection from cow's milk in the average working-class home is a very real thing, whether the infection is there when the milk is delivered, or whether the milk became infected in the home itself.

7. *Psychological*.—Suckling is said to confer a definite psychological advantage to the infant and to the mother.

8. *Maternal Health*.—A period of lactation is said to promote maternal health. This must, however, be qualified by saying that a mother forced to do all her own housework and look after a family as well, may find the feeding of a vigorous infant too much of a physiological strain.

9. *Cost*.—Human milk is less costly and simpler (in most cases) to administer than cow's milk.

Milk used to be thought of as a perfect food and that is probably why in the past it was thought sufficient to permit a child to be restricted solely to milk diet for a year or more.

It should be appreciated that milk is inadequate in certain respects if it is continued for long as the sole article of diet. The deficiency of iron has already been mentioned and although most infants probably have a moderate store of this mineral at birth, it is unwise not to recommend some iron-containing supplement by the fourth month.

The vitamin D content of human and cow's milk is subject to much variation,

particularly in the case of the latter. Winter cow's milk in particular is likely to be very low in this vitamin. The amount present in human milk will depend upon the degree of exposure of the mother to sunlight and to her vitamin D intake. Under natural circumstances, that is, in the case of a mother living in a warm sunny climate and wearing few clothes, sufficient vitamin D would probably be excreted in the milk. But although the human race apparently evolved in a warm sunny climate, its migration northward into colder and more cloudy climes has deprived it of its chief source of vitamin D, and care must therefore be taken to include this vitamin in the diet, particularly in that of the young and growing child. The more rapid the growth, the more vitamin D required, and since growth immediately after birth is most rapid, it is obvious that vitamin D supplements should be given as soon as possible after birth. This is even more essential in the case of a premature baby in which the post-natal growth is so rapid that great care must be taken to prevent it from developing some signs of rickets by administering some 1,400 international units of vitamin D daily, almost at once. For a full-term infant 700 international units is probably adequate.

It is probable that if the mother consumes enough foodstuffs containing vitamin C that the infant will satisfy its vitamin C requirements from the milk it imbibes, but if the mother's diet is short of this vitamin, the infant's diet will be short also. It is very difficult to provide sufficient vitamin C from cow's milk, because fresh milk is relatively low in the vitamin compared with human milk, and also there is considerable loss by oxidation during transportation, and owing to the effect of light. Some early source of vitamin C is therefore desirable—either for the mother if the baby is breast fed, or for the baby itself if it is on the bottle. (The baby should receive about 30 mgm. daily.) The use of National cod-liver oil and orange juice has therefore much to recommend it, for these preparations supply the two elements in which the infant's diet is prone to be deficient, and it may be that the introduction of these two substances to the public in the Welfare Foods Scheme has played a material part in the progressive decrease of the infantile mortality rate in Great Britain in recent years.

The time of introduction of solid food to the child is a subject which is still a subject on which there are a considerable diversity of views. Generally speaking, the attitude to this problem is much too conservative. Some physicians feel they are being daring in permitting a teaspoonful of egg yolk at six months, but more recent views suggest that egg yolk can be given at three months or earlier, that vegetable purées can be given at the fourth month, and that by six months extra calories can be added to the diet in the form of finely-mashed potatoes mixed with a plentiful amount of milk. That by the seventh and eighth month extra protein as eggs, finely-grated cheese, finely-shredded or minced meat or fish can be given, with considerable value to the infant. A fetish is often made of bone broth and much time and energy is often devoted to its preparation. Its nutritional value is extremely slight; its main value is that it helps to introduce the baby to meaty tastes—but no baby would suffer because it was not given bone broth.

Most fancy infant foods have little to recommend them and few of them have anything that national dried milk does not contain.

Personally I should suggest that cereal preparations should not be given before six to eight months and that the first extra foods should be green vegetable purées and finely-mashed potato with plenty of milk. One or two commercial cereal foods are valuable in that they contain added minerals and sometimes vitamins as well, but many of them are unnecessarily expensive and contribute little beyond carbohydrate to the diet.

For those who still fear it is dangerous to start solid food too soon and who are over-finicky about what a baby should or should not be allowed to eat, I should like to quote the following, taken from the White House Conference¹⁴ on "Child Health and Protection," and I should like to conclude my address on the theme which it sounds.

"Dr. Clara Davis has allowed twelve babies from six to eight months of age, who had never had any food other than breast milk, to select their own diet for a period of years from a large assortment of natural, uncombined, unsophisticated, and unseasoned foods, such as we ordinarily associate only with an adult or older child. Anorexia is here unknown except when sickness intervenes. Anyone who has experienced the thrill of seeing these perfect physical specimens sit down to a meal with an abandon which harks back to the primitive, must realise that the child has much to teach us about dietetics of childhood. Anyone who sees one of these children eat ten eggs at one sitting, or seven helpings of potato, or, at six months of age, make a whole meal of chopped raw lettuce, or drink almost no milk for months (all actual experiences), and yet present an optimal state of nutrition as checked by all known methods, is less apt to allow 'one egg or two small patties of meat a week,' at one year of age, or insist on 'a quart of milk or more a day' for all children, whether they want it or not. Dr. Davis has shown quite clearly that a consideration of food amounts, vitamins, and calories alone is not sufficient for an understanding of all factors governing nutrition."

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Granuloma Inguinale

By P. A. CLEARINK, O.B.E., M.D.

GRANULOMA INGUINALE is generally considered a tropical disease, but the movement of masses of young men to and from the tropics during the war years may be expected to result in its extension to temperate climates. Even before the war it had spread all over the United States of America, from New York to San Francisco, and from Seattle to New Orleans, appearing first at the great seaports and spreading inland along the main lines of communication. No apology need therefore be made for writing on this subject, more particularly since two cases have been recognised in Belfast, in patients who have never left the United Kingdom, so that its presence here is a fact which must be faced by medical practitioners and considered when any intractable ulcerative condition of the ano-genital region is seen.

The writer has seen several hundred cases of the disease in the West Indies, and the following account of its clinical aspects is compiled from his experience.

The disease was first described by McLeod (1882) in Madras under the title of "Serpiginous Ulceration of the Genitals." Conyers and Daniels (1896), writing from British Guiana, gave a very detailed account of "The so-called lupoid ulceration of the genitals," and the histo-pathological changes were described by Galloway (1897) from material supplied by Conyers and Daniels. Donovan (1905) described intracellular inclusions in large mononuclear cells in cases seen in India, and these inclusions have since been termed Donovan Bodies (not to be mistaken for Leishman-Donovan bodies found in kala-azar). Later accounts were confused with different varieties of genital ulceration described under the title "granuloma inguinale," so that it is necessary to define the condition under discussion before proceeding further.

The three main ulcerative conditions found in the genital regions are chancroid and phagadenic ulceration, granuloma inguinale, and lymphogranuloma venereum. Chancroid and phagadenic ulcerations are too well known in temperate climates and do not require further description, but lymphogranuloma venereum and granuloma inguinale have been so confused that it is necessary to describe the disease condition referred to under each head.

Lymphogranuloma venereum affects primarily the lymphatic system of the genital region, with formation of inguinal buboes and subsequent ulceration which is rapidly progressive, destructive to the deeper tissues, with a foul-smelling purulent discharge, gives a positive Frei reaction, frequently causes rectal stricture, and the causative agent is a filter-passing virus. There may be variations in this picture. Buboes may appear and gradually fade away without ulceration, and in the female there may be no signs of the disease until rectal stricture develops as a result of localization of the infection in the lymphatic system of the pelvis, with subsequent fibrosis.

Granuloma inguinale on the other hand affects the skin and subcutaneous tissues

of the genital region with formation of a cellular granulation tissue, with subsequent fibrosis and scarring without obvious involvement of the lymphatic system, causes little or no pain or constitutional disturbance. It is a very chronic, slowly-progressive disease and in uncomplicated cases gives rise to a profuse non-purulent serous or sero-sanguineous discharge with a peculiar acrid odour. It does not ulcerate or invade the deeper tissues (except in cases complicated by secondary infection); the etiology is unknown, but it is associated with intracellular inclusions known as Donovan bodies.

It is unfortunate that two dissimilar conditions have been given such similar names; granuloma inguinale is referred to in the English literature as "lymphogranuloma inguinale," an unfortunate title, as it does not affect the lymphatic system. It has also been termed "ulcerating granuloma of the pudenda," another unfortunate title, as in uncomplicated cases it does not ulcerate; and granuloma venereum, which is better, except that it is liable to confusion with lymphogranuloma venereum.

A great deal of work has been done on these conditions by American observers in the last twenty or thirty years, and there the former condition is termed "lymphogranuloma venereum," and the latter "granuloma inguinale." It is proposed to use these two terms for the purpose of this paper to avoid confusion.

Granuloma inguinale is, as has been said, generally considered a tropical disease, but has recently been found in temperate zones, still more recently in our own country. Negroes are said to be more susceptible than other races, but it is doubtful if there is any real racial susceptibility. In my own experience in Trinidad, more cases were seen in persons of African descent, but as they form the largest racial unit in the island and comprise the great bulk of the most degraded section of the population, undernourished, sexually promiscuous, and living under the most insanitary conditions, morally and materially, they are thus more exposed to repeated opportunities of infection. Cases have been reported in all races—Negroes, Indians, Chinese, and Europeans. In England, all cases reported up to the present have been in persons such as seafaring people who have been exposed to infection in the tropics. The cases discovered in Belfast are both European who have never been abroad and have had no contact with the tropics. They must, therefore, have acquired their infection locally, and are the first indigenous cases to be described in the United Kingdom.

Age Incidence.—The age incidence, as observed in Trinidad, is as follows:—

20 years and under	-	-	-	21 cases.
21 to 30 years	-	-	-	77 cases.
31 to 40 years	-	-	-	48 cases.
41 to 50 years	-	-	-	27 cases.
Over 50 years	-	-	-	15 cases.

Other observers give similar figures and it is apparent that the greatest incidence is at the age of greatest sexual activity.

Sex.—It is generally agreed that granuloma inguinale is more common in men than in women, and this is supported by the Trinidad figures. Of 188 cases observed at the Caribbean Medical Centre, 120 were male, and 68 female subjects.

Epidemiology.—Granuloma inguinale is generally considered a venereal disease contracted by sexual intercourse, but this is contested by some observers, as cases have been recorded in young children and accounts have been published of non-venereal cases. In endemic regions, however, it is always considered a venereal disease. No extra-genital cases have come under my observation.

Clinical.—The early lesion is a small raised patch of granulation tissue which is described as having started as a small papule or vesicle which bursts and spreads. This lesion is not an ulcer, it is raised above the level of the surrounding skin, the margin is sharply defined, firm, smooth and rolled, not punched out, ragged, or undercut. The surface is red, elevated, granular, and bleeds easily with a slight serous non-purulent discharge; there are no constitutional disturbances and the patient appears to be in ordinary health. The regional lymph nodes are not enlarged, the lesion is not painful, and there is little or no tenderness.

Early lesions are seen on the foreskin, glans, sulcus or shaft of the penis, and usually on the labiæ in the female.

Later lesions are an extension of the early lesion. They may develop by extension along the shaft of the penis or a fresh lesion may be found in the inguinal region. Some observers consider that the causative organism (said to be the Donovan body) spreads along the regional lymphatics, causing little disturbance on its way, localizes in the regional lymph nodes, and passes out to the adjacent skin to initiate the granulomatous process afresh in the inguinal region.

Later lesions are of a variety of types. They may be ulcerative, hypertrophic, or cicatricial. The so-called ulcerative (it is a bad term, as the condition is not an ulcer) type is an extension of the lesion just described and has the same characteristics—the raised granulomatous surface, an elevated, smooth, rolled but not undermined edge with a festooned outline, the surface bleeds easily, and is bathed in a plentiful sero-sanguineous non-purulent secretion with a peculiar acrid penetrating odour. It may be healing in one place, with formation of scar tissue, and progressing in another. Even in the presence of very extensive lesions the regional lymph nodes are not affected, there is no constitutional disturbance, no invasion of the deep tissues, or ulceration. It tends to spread along the moist surfaces in the scrotal folds, natal clefts, and anal region. Its progress is characteristically slow and chronic over a period of years, rather than months, if left untreated.

Although the skin of the ano-genital region is mainly affected, cases have been described in the mucus membrane of the vagina, urethra, and the cervix uteri, and of metastatic involvement of other organs, but the latter must be rare and was not seen in any of my Trinidad cases.

Late Lesions.—Complications due to secondary infection with various micro-organisms (fuso-spirochaetosis, streptococci, and various aerobic and anaerobic bacteria) are seen in a number of cases. The onset of such complications is indicated by constitutional symptoms, pain, purulent foul-smelling discharge, and an ulceration involving the deeper tissues. The granuloma is, however, as a rule, relatively insusceptible to secondary infection if the patient is reasonably clean and hygienic, but in the depressed classes of the population, who are undernourished, of insanitary habits, and addicted to excesses, such secondary infections are not uncommon.

Oedema and subsequent elephantiasis of the penis and scrotum in the male, and of the clitoris and labiæ in the female, are common.

Carcinoma of the genitals has occurred in a number of my cases, several of which showed on biopsy the histological structure of granuloma inguinale in one part and carcinoma in another.

Diagnosis.—The clinical features in the uncomplicated case are characteristic, and indeed diagnostic. The raised, non-purulent, granulomatous lesion with little pain or tenderness, showing no glandular involvement or constitutional symptoms, developing slowly, is a clinical picture not seen in any of the other venereal ulcerative conditions. Biopsy should be conclusive. The histological picture is characteristic, but might be mistaken by an observer not acquainted with granuloma inguinale for a malignant or pre-cancerous change. Donovan bodies are conclusive, but many intracellular bodies have been described in the literature wrongly as Donovan bodies. The superficial epithelial cells contain many inclusions, including bacteria, and can easily be mistaken for true Donovan bodies. For this reason, smears from the granulomatous area are unsatisfactory for diagnostic purposes. Moreover, the Donovan body is not easy to identify unless the observer is well acquainted with it and has good optical equipment. Confirmation of the diagnosis is therefore best obtained by biopsy.

Granuloma inguinale has not infrequently been mistaken for carcinoma, and the clinician should be on his guard when a lesion resembling carcinoma is seen in the genital region in young subjects.

Laboratory tests are of little or no value. There is no positive laboratory test for the presence of granuloma inguinale and positive serological tests, Frei, or Ducrey tests do not exclude it. All three were found positive with remarkable frequency in the Trinidad cases.

Treatment.—Intravenous injections of one of the preparations of antimony are specific in the early stages, but in old-standing cases cure may be difficult or even impossible. Surgery is required for removal of polypoid growths or elephantoid changes; X-rays and surgery for carcinomatous changes; secondary infection requires treatment with sulphonamides and penicillin. Surgical cleanliness, rest, good food, tonics, and general care of the health are all required.

Recently treatment with streptomycin is said to have had good effects in old intractable cases.

Specific Treatment.—Antimony was first employed by Aragao and Vianna in Brazil. They used one per cent. solution of tartar emetic in distilled water, 2 c.c. being injected every alternate day, slowly increasing the quantity until 10 c.c. was reached, then stopping all treatment for a week or two before commencing another course. Many such courses may have to be given and they should be continued for two or three months after healing is complete. Toxic symptoms such as dizziness, nausea, bone and joint pains, or diarrhoea are indications to stop treatment, but after a week or two it may be re-commenced with smaller doses.

The trivalent compounds of antimony are less toxic than tartar emetic. If a patient does not improve under treatment with one of the antimony preparations, another should be tried.

Prognosis.—This is a slow, chronic, progressive disease requiring great patience and continuous treatment. In the early stages antimony is specific, but, nevertheless, relapse is the rule even after complete healing and scarring has taken place. The patient must be kept under observation for years. Some cases progress in spite of all treatment and eventually develop constitutional symptoms, become cachectic, and die, but the disease may persist for twenty years or more, and the patient die of intercurrent disease.

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REVIEW

AIDS TO ANÆSTHESIA. By Victor Goldman, L.R.C.P., M.R.C.S., D.A. (R.C.P.&S.). Second Edition. Pp. viii + 316, with 85 illustrations. London: Baillière, Tindall & Cox. 1948. 7s. 6d.

THE first edition of this work in 1941 was eagerly welcomed, as it was an aid to all would-be anæsthetists. Now, in its new form, expanded and carefully revised, it has been brought up to date. Although he emphasises the fact that it is only an "Aid," the author has re-written a considerable part, and has made it more valuable as a book of reference.

From the preface, with its apt quotation, "No anæsthetic agent is safer than the person who employs it," to the valuable appendix of useful information, it is a book easy to read, as it is clear, concise, and clever. Who but the author would have likened the red blood corpuscles to barges on the canals of the transport system of the body?

The importance of teaching students how to use the open method is stressed. How often is a houseman able to give gas, oxygen, and ether, and yet would wonder which way to place a Schimmelbusch's mask?

Paradoxical respiration is clearly explained, and such modern drugs as trilene and curare dealt with. As regards prevention of post-operative pulmonary complications, the "hourly stir-up" is recommended—cruel to be kind. The diagrams and description of the Coxeter-Mushin absorber, which is terrifying at first sight to all students, the use of the Macintosh-Pask apparatus, so valuable in long intravenous anæsthetics, the description of the best method for a gastrectomy—the fashionable operation of the moment—are some of the new features, and are excellently presented.

The chapter on "Analgesia and Anæsthesia in Midwifery," by Dr. K. G. Lloyd Williams, has been modernised, and that on "Nitrous Oxide-Air Anæsthesia for Dentistry," by Dr. M. Hudson, has been revised and brought into line with the latest methods, although the mascara-laden tears of the first edition have disappeared.

Anæsthetists of all grades will welcome this work, and much can be learnt from it and from its excellent illustrations. It can be especially recommended to all who are teaching this subject to students and nurses. A larger, more complete textbook by the author, in his incomparable style, would be a welcome addition to modern medical works.

V. L.

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V. L.

The Causes of Relapse in Quiescent Cases of Pulmonary Tuberculosis*

By BRICE R. CLARKE, M.C., M.D.

DEFINITIONS OF THE TERM "QUIESCENT"

THE British definition until 1947 was as follows :—

"Cases which have no symptoms of tuberculosis and no signs of tuberculous disease, except such as are compatible with a completely-healed lesion, and in which sputum, if present, is free from tubercle bacilli."

The new definition of the Joint Tuberculosis Council is :—

"Cases in which the general condition and exercise tolerance are good, having regard to the extent of the lesion; which show no evidence of toxæmia; in which no tubercle bacilli have been found on three consecutive monthly examinations by stained film; and in which changes revealed by other clinical investigations and by serial skiagrams point to retrogression of the tuberculous lesion."

The Midhurst¹ definition, which requires special mention on account of the importance of the Midhurst figures, is different, as the term "Disease Arrested" is the equivalent of quiescent and is defined as follows :—

"General health completely restored in every respect, without any sign of disease of the lungs, except such as is compatible with a completely-healed lesion; sputum, if still present, free from tubercle bacilli."

The American nomenclature³ is entirely different, being as follows :—

"**ARRESTED.**—Constitutional symptoms absent. Sputum, if any, must be concentrated and found microscopically negative for tubercle bacilli. Lesions stationary and apparently healed, according to X-ray examination; no evidence of pulmonary cavity. These conditions shall have existed for a period of six months, during the last two of which the patient has been taking one hour's walking exercise twice daily, or its equivalent."

"**APPARENTLY ARRESTED.**—Constitutional symptoms absent. Sputum, if any, must be concentrated and found microscopically negative for tubercle bacilli. Lesions stationary and apparently healed, according to X-ray examination; no evidence of pulmonary cavity. These conditions shall have existed for a period of three months, during the last two of which the patient has been taking one hour's walking exercise daily, or its equivalent."

"**QUIESCENT.**—No constitutional symptoms. Sputum, if any, may contain tubercle bacilli. Lesions stationary or retrogressive, according to X-ray examination; cavity may be present. These conditions to have existed for at least two months, during which time the patient has been ambulant."

Broadly, the terms "arrested" and "apparently arrested" are equivalent to the

* A paper read in opening a discussion at the British Tuberculosis Association's Annual Conference in Edinburgh, July, 1947.

British term "quiescent," but the conditions laid down are more exacting in three respects. Investigation by sputum culture or animal inoculation is demanded, ability to perform at least one hour of walking exercise is a condition, and an observation period of three to six months is also a condition.

The American term "quiescent" is more equivalent to the British term "improved," as the sputum may remain T.B. positive and a cavity may be present.

In this paper the British term "quiescent," the Midhurst term "disease arrested," and the American terms "arrested" and "apparently arrested" are treated as synonymous.

The Percentage of Quiescent Cases.—All the available data relate to patients discharged from institutions. The British figures generally show a high percentage for T.B. negative cases and much lower figures for T.B. positive cases. Table 1 shows a few representative figures from the annual reports of British Sanatoria.

TABLE 1
IMMEDIATE RESULTS OF SANATORIUM TREATMENT (U.K.)

HOSPITAL		T.B. —	PERCENTAGE QUIESCENT			
			T.B. +1	T.B. +2	T.B. +3	All T.B. +
Forster Green Hospital,	1945 -	80	66	41	13	26
Cheshire Joint San.,	1939 -	4	—	—	—	—
Midhurst Sanatorium,	1939 -	78	60	41	—	36
Whiteabbey Sanatorium,	1945 -	73	69	44	13	25
High Carley Sanatorium,	1938 -	71	65	25	33	34

Results published in the United States generally show a higher percentage of quiescent cases on discharge, and this is probably related to the much longer period of treatment in hospital, to the high proportion of deaths in hospital, and to the exclusion from the tables of hospital deaths and untraced and "short-stay" cases. For example, of 1,213 white patients discharged alive from Glen Lake Sanatorium, Minnesota, 47.2 per cent. of the moderately advanced cases and 40.4 per cent. of the far advanced cases were quiescent.⁴ The average stay in hospital was 2.0 years for moderately advanced cases and 2.4 years for far advanced cases. More than 50 per cent. of far advanced cases and 10 per cent. of moderately advanced cases died in hospital. In the Mount McGregor Sanatorium of the Metropolitan Life Insurance Company⁵ "cure was terminated by death in 1.5 per cent. of the minimal cases, 20.7 per cent. of the moderately advanced, and 46.9 per cent. of the far advanced cases."

The frequency of relapse can only be inferred from mortality figures in Great Britain, but there are some American studies of a more comprehensive kind. As T.B. positive and T.B. negative cases have very different prospects, they will be considered separately.

The incomparable Midhurst statistics² are well known to students of tuberculosis. As regards T.B. negative cases, the figures suggest that condition on discharge has little bearing on the ultimate prognosis, but that the stage of disease on admission is the decisive factor.

TABLE 2
MIDHURST RESULTS, 1906-15
T.B. — Cases—Condition in 1940

GROUP 1			ALIVE		DEAD	LOST SIGHT OF	TOTAL
GROUP 1	Disease Arrested*	-	105	53%	64	28	197
	Imp. and Unimp.	-	27	47%	18	13	58
	TOTAL	-	132	52%	82	41	255
GROUP 2 & 3	Disease Arrested	-	14	28%	28	8	50
	Imp. and Unimp.	-	32	33%	55	11	98
	TOTAL	-	46	31%	83	19	148

* Equivalent to "Quiescent."

TABLE 3
MIDHURST RESULTS, 1915-1924
T.B. — Cases—Condition in 1940

GROUP 1			ALIVE		DEAD	L.S.O.	TOTAL
GROUP 1	Disease Arrested	-	226	72%	57	30	313
	Imp. and Unimp.	-	41	62%	13	12	66
	TOTAL	-	267	70%	70	42	379
GROUP 2 & 3	Disease Arrested	-	75	50%	57	19	151
	Imp. and Unimp.	-	96	54%	68	15	179
	TOTAL	-	171	52%	125	34	330

TABLE 4
MIDHURST RESULTS, 1924-1934
T.B. — Cases—Condition in 1940

GROUP 1			ALIVE		DEAD	L.S.O.	TOTAL
GROUP 1	Disease Arrested	-	216	82%	28	18	262
	Imp. and Unimp.	-	33	63%	11	8	52
	TOTAL	-	249	79%	39	26	314
GROUP 2 & 3	Disease Arrested	-	87	73%	27	6	120
	Imp. and Unimp.	-	81	55%	58	8	147
	TOTAL	-	168	63%	85	14	267

Table 4 shows that of quiescent cases discharged from Midhurst, at least 82 per cent. in Group 1 and at least 73 per cent. in Group 2 and 3 were alive five to fifteen years after discharge.

Tables 5, 6 and 7 show the late Midhurst results for T.B. positive cases.

TABLE 5
MIDHURST RESULTS, 1906-1915
T.B. + Cases—Condition in 1940

			ALIVE	DEAD	L.S.O.	TOTAL
GROUP 1	Disease Arrested	-	42 37%	65	8	115
	Much Improved	-	42 32%	84	7	133
	Imp. and Unimp.	-	4 13%	24	2	30
	TOTAL	-	88 32%	173	17	278
GROUP 2	Disease Arrested	-	44 35%	75	7	126
	Much Improved	-	70 18%	312	16	398
	Imp. and Unimp.	-	19 6%	289	8	316
	TOTAL	-	133 16%	676	31	840
GROUP 3	Disease Arrested	-	— —	6	—	6
	Much Improved	-	4 4%	97	3	104
	Imp. and Unimp.	-	6 1%	416	3	425
	TOTAL	-	10 2%	519	6	535

TABLE 6
MIDHURST RESULTS, 1915-1924
T.B. + Cases—Condition in 1940

			ALIVE	DEAD	L.S.O.	TOTAL
GROUP 1	Disease Arrested	-	64 63%	34	4	102
	Much Improved	-	45 47%	47	3	95
	Imp. and Unimp.	-	5 28%	11	2	18
	TOTAL	-	114 53%	92	9	215
GROUP 2	Disease Arrested	-	39 49%	35	5	79
	Much Improved	-	109 29%	256	15	380
	Imp. and Unimp.	-	16 12%	111	4	131
	TOTAL	-	164 28%	402	24	590
GROUP 3	Disease Arrested	-	11 34%	20	1	32
	Much Improved	-	63 15%	335	15	413
	Imp. and Unimp.	-	19 5%	376	4	399
	TOTAL	-	93 11%	731	20	844

TABLE 7
MIDHURST RESULTS, 1924-1934
T.B. + Cases—Condition in 1940

			ALIVE		DEAD	L.S.O.	TOTAL
GROUP 1	Disease Arrested	-	87	76%	18	9	114
	Much Improved	-	20	77%	5	1	26
	Imp. and Unimp.	-	11	50%	10	1	22
	TOTAL	-	118	73%	33	11	162
GROUP 2	Disease Arrested	-	84	63%	41	9	134
	Much Improved	-	127	57%	86	11	224
	Imp. and Unimp.	-	132	35%	229	11	372
	TOTAL	-	343	47%	356	31	730
GROUP 3	Disease Arrested	-	2	50%	2	—	4
	Much Improved	-	21	36%	37	—	58
	Imp. and Unimp.	-	57	19%	233	9	299
	TOTAL	-	80	22%	272	9	361

Table 7 shows that of quiescent cases, formerly T.B. positive, at least the following percentages were alive five to fifteen years after discharge: Group 1, 76 per cent.; Group 2, 63 per cent.; Group 3, 50 per cent.

One of the most important studies of relapse is from Mount McGregor Sanatorium, New York. A follow-up of patients who completed a cure, the great majority of whom were quiescent on discharge from the sanatorium, shows the following results (see Table 8, page 167) on the fifth anniversary of the completion of cure.

It is almost certain that the Midhurst and Mount McGregor results are far better than the average results of sanatorium treatment, on account of the selection of cases and the economic status of the patients at Midhurst and the length of treatment and after-care arrangements for the Mount McGregor patients. So far as the writer can ascertain, there are no figures closely comparable with the Midhurst figures for Britain, but Sir H. Bashford⁶ has published interesting material from the Post Office records. A study of 1,848 cases of pulmonary tubercle who returned to work between 1914 and 1926 showed that 58 per cent. had ceased to be fit for work ten years after resumption, as a result of recurrent pulmonary tuberculosis or other forms of ill-health. Among those fit for work at the end of ten years, the wastage for the next five years was 14 per cent. Although not strictly comparable, these British figures do not appear less favourable than the Mount McGregor sanatorium results. The American statistics from a group of Pennsylvania state sanatoria⁷ show the fate of discharged patients. Excluding untraced patients and those dying within a month of discharge, the mortality after seven years was 12.8 per cent. for minimal cases, 42.6 per cent. for moderately advanced cases, and 52.5 per cent. for far advanced cases. Dr. K. R. Guest, the author of this study, states that no correlation was found between stated condition on discharge

TABLE 8
MOUNT MCGREGOR SANATORIUM
Status on fifth anniversary of completion of cure.
Cases which completed cure and were ready to work prior to 31/12/34.
Admitted 1919-1934.

Status on Fifth Anniversary of Completion of Cure	MINIMAL				ADVANCED			
	Males		Females		Males		Females	
	Number	Per Cent.	Number	Per Cent.	Number	Per Cent.	Number	Per Cent.
Total	117	100.0	135	100.0	225	100.0	114	100.0
Able to work	104	88.9	122	90.4	168	74.7	87	76.3
Have worked continuously	81	69.2	107	79.3	118	52.5	79	69.3
Have cured again	23	19.7	15	11.1	50	22.2	8	7.0
Curing again	10	8.5	10	7.4	42	18.7	16	14.0
Dead—								
Tuberculosis	2	1.7	2	1.5	9	4.0	9	7.9
Not tuberculosis	1	.9	1	.7	6	2.7	2	1.8

TABLE 9
Patients discharged alive in 1933 who were in specified condition in 1938, classified by result of sputum test upon discharge.

Result of Sputum Test upon Discharge in 1933	Total	Patients in Specified condition in 1938					
		Living		Dead		Not Traced	
		Number	% Total	Number	% Total	Number	% Total
All groups	-	3,576	52	2,170	31	1,160	17
No sputum or no test made	-	241	65	41	11	89	24
Positive sputum	-	342	24	908	64	166	12
Negative sputum	-	2,189	66	630	19	505	15
Result of test not reported	-	804	45	591	33	400	22

and ultimate fate—an astonishing conclusion. Another American report which bears more directly on the ultimate fate of quiescent patients is the analysis of the results of seventy-five U.S.A. sanatoria by Dr. Whitney and Dr. Dempsey.⁸ This study of 6,906 patients shows that more than a quarter of the patients (1,795) had no sputum test within two months of discharge. About 30 per cent. of the patients (2,047) were discharged against advice.

Table 9 shows results after five years. The patients classified as T.B. negative on discharge would correspond closely with quiescent patients.

Sinding-Larsen's report of the results of treatment in Boserup Sanatorium, Denmark, during the years 1910-1920 shows the following results after ten years' observation of every patient.⁹

TABLE 10
BOSERUP SANATORIUM (DENMARK), 1910-1920

1,666 BACILLARY AND 816 ABACILLARY PATIENTS.

83.1 per cent. of abacillary patients alive after ten years.

32.0 per cent. of bacillary patients alive after ten years.

57.6 per cent. of "debacillated" patients alive after ten years.

17.0 per cent. of permanently bacillated patients alive after ten years.

So far this paper has been concerned with the presentation of facts, but the remaining part belongs to the realm of speculation. It is difficult enough to present the facts accurately concerning any aspect of tuberculosis, but the causes of relapse, whatever they may be, are certainly not susceptible to statistical analysis. Besides the nature of the disease and the lack of a specific remedy, I would attach importance to faulty classification, absence of resistance in the individual patient, failure to apply collapse therapy correctly, and the lack of after-care, particularly financial after-care. The length of sanatorium treatment has a bearing on the question of relapse, although the studies of Dr. G. Berg¹⁰ and, more recently, of Dr. W. H. Tattersall¹¹ indicate that sanatorium treatment *per se* has little or no effect on prognosis. There may be no reliable evidence that rest in hospital (apart from collapse measures) is superior to rest at home under good conditions, but obviously long stay in hospital improves the opportunities for complete investigation, with accurate classification and assessment of the patient's condition: also, as shown by the American statistics, long stay in hospital removes many of the unfavourable cases by death.

In the writer's opinion, the case is entirely different as regards collapse therapy. It matters little whether we agree that the late results of collapse therapy, as published by Hartley, Wingfield and Burrows,¹² P. W. Edwards,¹³ R. R. Traill, Sinding-Larsen, B. R. Clarke and S. L. W. Erskine¹⁴ and others have proved its value, statistically speaking. The curative effect of this line of treatment, employed systematically and scientifically by a medical and surgical team, should be self-evident. Failure to cure a substantial percentage of patients by collapse therapy suggests that the selection of cases or the technique (including the after-care technique) is faulty and in need of revision. For a perfectly frank statement of the

present position about collapse therapy, one must turn again to an American author¹⁵: "Results with pneumothorax do vary greatly with the way it is used; that there are right and wrong ways of applying it and that, for this reason, its potential value will be fully realised only when it is conceived as a much more exact procedure than at present . . . It seems probable that the widely divergent opinions as to the value of the pneumothorax are mainly a reflexion of the many illogical ways it has been used; that once the present loose conception of it is corrected and it comes to be used in such a way that the term pneumothorax automatically connotes an effective, well-managed pneumothorax, then the controversy over its merits will largely disappear."

On the question of whether this criticism made in the United States would apply also at home, attention is drawn to two facts only. When the Joint Tuberculosis Council circularised two hundred institutions for the results of collapse therapy, forty-two institutions collaborated in the research. The conclusion of the Joint Tuberculosis Council Report included the following sentence: "Those institutions which contributed large numbers of cases show results far superior to the general average." It is a pity that some of the energy which has been expended in demanding statistical proof of the value of A.P. and other collapse measures has not been devoted to improving the equipment of small sanatoria and chest clinics. How many tuberculosis officers are expected to do refills without proper screening facilities? How often is a pneumothorax discontinued without consultation with the physician who induced it originally? How many tuberculosis physicians have realised the value of bilateral collapse? And, most important, what is the average waiting period between the date of diagnosis of active pulmonary tuberculosis and the date of induction of artificial pneumothorax in hospital or in the patient's home? The value of early collapse of the lung as a life-saving measure is emphasised by the recent work on amyloidosis and on latent intestinal tuberculosis. Every measure which checks the spread of tubercle bacilli and of their toxins relieves the patient from serious dangers, both dangers of tuberculous complications and risks of progressive, degenerative changes in the body tissues, of which amyloidosis may be only one example.

The apparent relapse of many patients is the result of faulty classification on discharge, due to errors of judgment or, more frequently, to failure to carry out a proper radiological and bacteriological control. But even after the most conscientious investigations there will be a high rate of relapses. Further clinical research is required on this subject. At present we know that frequency of relapse is related to the severity of the disease on admission to hospital. There is evidence, too, that certain clinical features, such as febrile onset, a persistently high blood sedimentation rate, or a tendency to multiple cavitation, are associated with a bad prognosis, no matter how well the patient responds to treatment for a time. In the tuberculosis hospital of the future there will, no doubt, be a series of biochemical or other tests available which will assist the clinician to measure the real progress towards healing in a way which present knowledge does not permit.

Another factor with an obvious bearing on relapse is that of after-care, and particularly that of financial assistance for the patient who has recently suffered from

active disease. If it is impossible to prove the value of sanatorium treatment statistically, it is not difficult to prove the effect of poverty on the prognosis of pulmonary tuberculosis. The assistance given to patients under Memorandum 266/T, in spite of its limitations, has already helped many during the period following discharge from an institution. If these patients are to have a fair chance of permanent recovery, many of them will require financial assistance for several years, some will require housing assistance, including accommodation in hostels or night sanatoria, and suitable cases will need sheltered employment. It is a remarkable fact that many of the soldiers who contracted tuberculosis in the 1914-1919 war, including the T.B. positive cases, have made good recoveries and are alive at the present time. These men had comparatively little sanatorium treatment and very little collapse therapy. What they did get was a measure of financial security through their disability pensions and this has been sufficient to bring about the recovery of a remarkable degree of health in many of these men.

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REVIEW

AIDS TO MALE GENITO-URINARY NURSING. By John Sayer, S.R.N., D.N. Pp. 130. Baillière, Tindall and Cox. 5s.

THIS is an excellent little book which should meet a long-felt need, and is especially welcome at a moment when male nurses are becoming more numerous.

The book is divided into a number of sections dealing in turn with the anatomy of the male uro-genital tract, medical and surgical conditions affecting chiefly the male subject, special nursing procedures, and an excellent section giving a simple description of instruments used and the method of using them.

There is a short section describing the diet and drugs used in the treatment of uro-genital tract infections. The section on Venereal Disease is brief and to the point, though it is a pity that the author falls into the common fault of including the neoarsphenamines and bismuth preparations as N.A.B. and Bismostab respectively.

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K. H.

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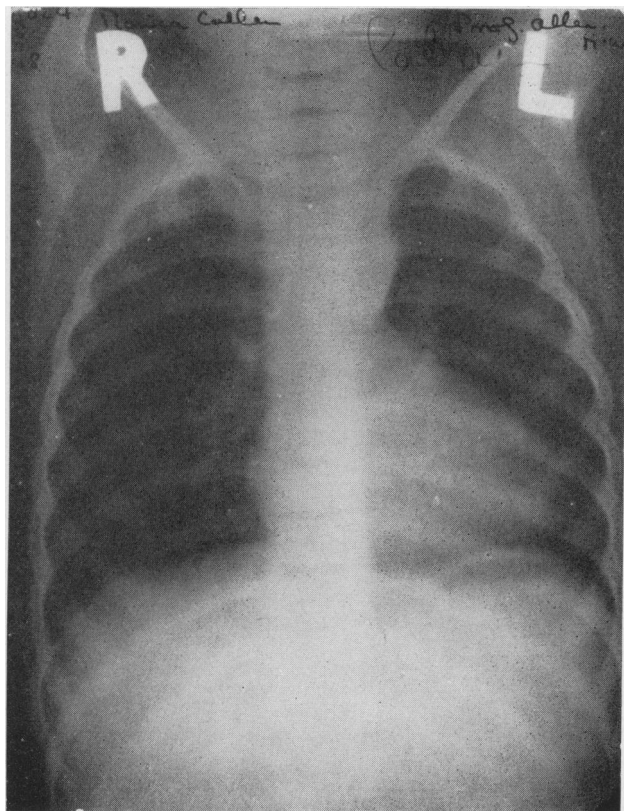
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FALLOT'S TETRALOGY : THE CLINICAL ASPECT (DR. BREakey)



A typical X-ray of Tetralogy of Fallot

Fallot's Tetralogy: The Clinical Aspect

By V. K. ST. G. BREAKEY, M.D., M.R.C.P.I.

THE surgery of congenital heart disease provides one of the most brilliant and exciting chapters in modern therapeutics. Ten years ago Paul White could write in his standard textbook on cardiology: "There is no known curative treatment, medical or surgical, for congenital cardiac defects." Then, in 1938, Gross, in Boston, successfully tied a patent ductus arteriosus; in 1944 Crafoord, in Stockholm, excised a coarctation of the aorta; and in 1945 Blalock and Taussig, in Baltimore, reported their ingenious operation for the tetralogy of Fallot.

The essential features of the tetralogy of Fallot are:—(1) Pulmonary stenosis, (2) high interventricular septal defect, (3) dextroposition of the aorta, (4) right ventricular hypertrophy. Dextroposition of the aorta indicates that the aorta overrides the high ventricular septal defect and therefore receives some blood directly from the right ventricle. In the Blalock-Taussig operation the proximal cut end of a systemic artery—innominate, subclavian, or carotid—is anastomosed to the pulmonary artery, forming an artificial ductus arteriosus and giving the blood, as it were, a second chance of reaching the lungs.

To turn now to the clinical approach to the problem. The cardiologist must be prepared to answer three questions:—

(1) Is the case operable? And if so, is operation a matter of urgency or should it be deferred?

(2) How much help does the patient need? If the disability is great, the anastomosis of a small subclavian artery may not be enough and it may be desirable to use a larger vessel.

(3) On which side is the aortic arch? This is easily determined clinically under the X-ray screen, and is an essential point in planning the operative approach. It is of considerable importance, in that twenty-five per cent. of cases of the tetralogy have a right-sided aortic arch.

Routine clinical examination yields a wealth of interesting points: the blue skin and mucous membranes, the clubbed fingers and toes, the dyspnoea on exertion, relieved by squatting. There may be a harsh systolic murmur to the left of the sternum accompanied by a thrill, but, indeed, there may be no murmur at all. Of more importance is a pure pulmonic second sound. The other point of diagnostic importance is a low pulse-pressure. Should heart failure develop, there is a curious absence of râles in the lungs, an important practical point to remember. As a rule, a most useful early sign of heart failure in children is râles at the lung bases, and so if the respiration rate is not carefully observed, one may well miss early failure in the presence of a pulmonary stenosis. One may ask if there is no murmur present and cyanosis is late in developing, as it so often is, how does one diagnose this condition in early infancy? I would say, quite definitely, that congenital heart

disease should never be forgotten as a cause of failure to thrive. The baby should be seen by a cardiologist, who can give a helpful opinion after X-ray screening.

Estimation of the polycythæmia gives an indication of the severity of the case. Perhaps even more useful than red cell count and hæmoglobin estimation is a hæmatocrit reading. It is a useful working rule that if the hæmatocrit reading is over 70 there is a danger of cerebral thrombosis, and operation is a matter of urgency.

Blood taken from the femoral artery in a normal subject is 95 per cent. oxygenated. In these children I have seen it as low as 12 per cent. As a rule, however, the figures lie between 30 per cent. and 60 per cent. In a certain group of children the arterial oxygen appears to be relatively high, but drops rapidly on exercise.

The electrocardiogram shows a right ventricular hypertrophy and abnormal P waves, but one looks particularly for evidence of a heart block, for this is an ominous sign. The strain of operation may well turn a partial block into a complete block, with death on the table.

X-ray examination and fluoroscopy establish the diagnosis. The contour of the heart is characteristic. The size is normal, with a concavity in the region of the pulmonary conus. The lung fields are clear—remarkably so. In the left anterior oblique position that area below the aortic arch, ordinarily filled by the pulmonary artery, is empty, and this we refer to as a clear “pulmonary window.” Clinical examination without fluoroscopy in almost any case of congenital heart disease is worthless; indeed, there is only one type of congenital malformation which can be diagnosed on auscultation alone, and that is a patent ductus arteriosus. At fluoroscopy it is imperative to exclude from operation those cases showing expansile pulsations in the lung fields. Vascular pulsation indicates that the pulmonary blood-flow is adequate, and it is obvious that operation would lead to overloading, pulmonary œdema, and rapid death. The whole purpose of the operation is to increase the quantity of blood reaching the lungs.

In some cases diagnosis is difficult and one then turns for help to ancillary methods of investigation, circulation time, catheterization of the heart, and angiocardiology.

Having decided on surgery, one assesses the urgency for operation. In general, the operative risk is lowest in the age group five to ten years—not more than ten per cent. in uncomplicated cases. However, if a child is grossly under-developed mentally or physically, perhaps having convulsions daily, one should carefully weigh the risk of waiting against the operative risk. One would like to follow these children from earliest infancy. An appreciable number that could be saved, now die in the early years. Over 15 years the risk rises steeply. It is, perhaps, useful to remember that the tetralogy of Fallot is compatible with a long life; however, activity is so pathetically curtailed that most of these older patients prefer to risk operation.

To turn now to the general medical care of these children. I cannot overstress the fact that these children should be allowed to run around and play as ordinary children. No harm can result. It is cruel to force a child to walk, but it is even more cruel to keep him tied up in bed. These children walk rather later than normal,

perhaps not until three years. Soon after learning to walk they learn to squat to relieve their dyspnoea. It is interesting to note here that this squatting habit is quite characteristic and not observed in those other congenital cyanotics who have adequate pulmonary circulation. It is a habit to be encouraged, even though it leads to ankle deformity, eversion of the ankles, knock-knees, and bad posture. However, it does enable these children to get around in a way that they otherwise could not do. I mention this because occasionally one meets a mother who, embarrassed by this squatting in public, will nag at the child until he, too, becomes self-conscious about it. The problem of the blue baby and his mother calls for a great deal of sympathetic insight. The child is mentally alert and intelligent and sadly aware of his disability.

A few words on the post-operative care of these patients may be of interest. Penicillin is begun twenty-four hours before operation and continued for about seven days. The child is put in an oxygen tent before leaving the theatre and remains in it for forty-eight hours. Careful fluid control is, perhaps, the key to success. Too much fluid increases the risk of pleural effusion; too little the risk of cerebral thrombosis. When breakfast is to be withheld on the morning of operation, it is important to give drinks during the previous night. A polycythæmic child should never, under any circumstances, be without fluid for more than twelve hours. Apropos to this, one deprecates the promiscuous giving of enemas and purges. For the relief of pain and dyspnoea, morphia has a specific action comparable to its action in acute left ventricular failure of adults. Venesection before operation is a dangerous procedure. After operation the need for a polycythæmia has been removed and judicious small venesection relieves the load on the heart.

In general, quick treatment of the very earliest signs of complications brings far better results than elaborate routine precautions. By way of example, I feel it is far wiser, in the presence of a raw area in the thorax, to withhold heparin: if one watches carefully one can detect the earliest sign of paresis, start heparinization, and residual paralysis is minimal. The post-operative care calls for streamlined efficiency and split-second timing. Pulse, respiration, blood pressure should be charted quarter-hourly for the first twelve hours. Circulatory changes can occur so very rapidly in a young child.

There are many possible serious complications—aspiration of a pleural effusion is almost a routine. The lung is collapsed at operation and pneumothorax may result from failure of the lung to expand. A tension pneumothorax may result from over-forcible expansion and may necessitate removal of air. Cerebral thrombosis is the most serious complication. Thrombosis may also occur at the site of the anastomosis. However, one need not overstress the complications, for, in general, these children are fit to be out of bed in ten days, home within three weeks, able to climb stairs in six weeks, ready for school and unlimited activities in three months.

A few words now about the sort of results one can expect.

G. M., a little boy aged seven, was seen by me at the Royal Belfast Hospital for Sick Children. He was in constant distress—could not walk ten yards without gasping for breath and squatting down. He was intensely cyanosed—a metallic

blue on exertion.. Now, one month after operation by Mr. Purce, he shows no obvious cyanosis, his finger clubbing has almost disappeared, his activity is unlimited, and he is running around playing football.

G.M.			BEFORE	AFTER
Op. 3/9/48	-	-	1/9/48	1/10/48
R.B.C.s	-	-	7.5 million	5 million
Hb. % (Sahl.)	-	-	140	85
Arterial O ₂ % Saturation	-	-	30	90

The results of this operation have caught the public imagination, both medical and lay. Indeed, it is no exaggeration to say that there must be very many patients in all parts of the country who, from cardiac cripples, will become normal, happy, active children.

REVIEW

ORAL AND DENTAL DISEASES. By Hubert H. Stones, M.D., M.D.S., F.D.S., R.C.S.(Eng.). Pp. 916, figs. 926. Edinburgh : E. & S. Livingstone Ltd. 1948. 90s.

THIS book by the Professor of Dental Surgery at the University of Liverpool will immediately become a standard work on the subject. Its style is lucid, the presentation of subject matter orderly, whilst the range of conditions described is so comprehensive that one could rarely consult it without finding a description of the disease in question, and the claim made on its title page that it is a reference work for dental and medical practitioners is fully substantiated.

Each condition is discussed under the headings of ætology, pathogenesis, histopathology, clinical features, and treatment. The text is supplemented by clinical and microphotographs, many of them in colour and beautifully reproduced. The subject matter is up to date and considerable space has been given up to critical discussion of recent experimental research. Judging from the number of authorities cited, the author's knowledge would appear to be encyclopædic and the extensive bibliographies at the end of each chapter strengthen this impression. Due credit is given to British work. Of the forty-two chapters, those dealing with stomatitis and acute infections of the face and neck should have a special appeal for medical practitioners who are frequently called upon to see such cases before the dental surgeon. The discussion on oral sepsis in relation to systemic disease should help to give a better and more balanced outlook on this controversial problem. The chapter on orthodontics condenses a complex subject to just over forty pages and includes the author's own classification of the abnormalities involved. The most disappointing feature of the book are some of the descriptions of treatment, but the writer is mainly concerned with pathology, so that other works should be consulted for these.

The volume has been lavishly produced by Livingstone and is well indexed. It can be recommended to both student and practitioner.

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Fallot's Tetralogy: The Pathological Aspect

By J. EDGAR MORISON, M.D., B.SC.

THE general pathologist has, until very recently, shown little interest in congenital malformations of the heart. Apart from a few anomalies thought to be significant in the production and localisation of bacterial endocarditis, most of these anomalies have been encountered by him in new-born infants, or in infants dying within the first six, or, at most, twelve months of life. The lesions have usually been complex and highly variable from case to case, and it has often been difficult to appreciate how the child lived at all. To make a detailed anatomical study of the abnormalities found in early infancy would deter anyone from ever expecting to make an accurate clinical diagnosis. Until Dr. Taussig's work, it may be said that only a few workers appreciated that, among those children surviving beyond the first year of life and showing cyanosis, the great majority suffered from a fundamentally similar defect and showed the four features described by Fallot in 1888 and usually known as the "tetralogy of Fallot."

No sound knowledge of any disease can be obtained without some understanding of its structural basis. Biochemical equations and biophysical concepts may be enough for some, but most of us will feel, as Robert Louis Stevenson said in another context, that these concepts lie in regions where there is no habitable city for the mind of man. Some such apology is necessary for this brief account of the morbid anatomy of the condition.

The condition as described by Fallot consists of four features, hence the name "tetralogy." These are pulmonary stenosis or atresia, dextroposition of the aorta, an interventricular septal defect, and hypertrophy of the right ventricle. These must be discussed separately.

PULMONARY STENOSIS OR ATRESIA

The pulmonary stenosis may affect either the infundibulum of the right ventricle, that is, the portion of the heart representing the bulbus cordis of lower animals, or the pulmonary valve only. Involvement of the infundibulum may vary from what is almost a subdivision of the right ventricle into two halves, with a narrowed orifice between, to a complete, or almost complete, absence of the passage leading to what may be only a fibrous strand representing the pulmonary artery. The difficulty of diagnosis of the site and nature of the obstruction during life must temper enthusiasm for operations directed to the heart or to the valve itself,² and especially for all attempts to divide structures blindly in the heart chambers.

When there is a pulmonary atresia and no passage for blood direct from the right ventricle to the lungs, the condition is often called an extreme tetralogy, and the circulation to the lungs depends on blood passing to the pulmonary arteries along the ductus arteriosus and on the bronchial arteries arising from the aorta. The ductus arteriosus undergoes functional closure immediately after birth, and, though it may remain open or re-open temporarily under conditions of extreme

anoxia,^{7, 8} it must, if properly developed, undergo permanent organic closure in a few months.⁶ In these cases the condition of the bronchial arteries and of the various lung branches from the mediastinal arteries is rarely adequately studied at autopsy. The literature has been reviewed by Christeller (1916).³ Death in the early months of life is rarely to be attributed only to closure of the ductus arteriosus. The worst cases have the walls of the stenosed infundibulum or the valves so fixed by fibrosis that they cannot expand with the growth of the other blood channels. Some assessment of salvageable material is probably possible at the end of the first year of life.

DEXTROPOSITION OF THE AORTA

The dextroposition of the aorta means that the aorta comes to lie across the outflow from both ventricles, so that it receives blood from both. Though described as a Type I transposition of Spitzer (1923),¹¹ it is not a true transposition, since the pulmonary artery still arises entirely from the right ventricle and is not transposed to the left ventricle. This dextroposition varies from case to case and is important, since the aperture between the aorta and the left ventricle is really a measure of the volume of oxygenated blood received from the lungs and expelled from the left ventricle into the aorta.

INTERVENTRICULAR SEPTAL DEFECT

The defect in the upper membranous part of the interventricular septum is the inevitable result of the incomplete dextroposition of the aorta. The formation of the cardiac septa is one of the most difficult subjects in embryology and it is unnecessary to discuss it here.

HYPERTROPHY OF RIGHT VENTRICLE

The right ventricle is hypertrophied in relation to the heart as a whole and to the left ventricle. This is due to this chamber having to expel the blood derived from the left ventricle and received by the great veins, plus that quantity of blood which it has driven into the aorta instead of into the pulmonary arteries, and which then also returns to it through the systemic veins and the right auricle. It must also expel this blood through the narrowed pulmonary orifice, or at a blood pressure equal to that in the systemic circulation into the aorta.

The functional result of these abnormalities is that only a part of the total blood volume passes through the lungs during each circuit, and a volume of unaltered venous blood, varying from case to case, is passed direct into the systemic circulation. This reduced pulmonary blood-flow is probably responsible for the lesions which develop in the pulmonary arteries and veins. These are well described by Rich (1948).¹⁰ Thrombi, composed in great part of fibrin, form in these vessels and undergo organisation. These thrombi never appear to occlude the entire lumen of a vessel, and they undergo recanalisation. The proportion of vessels affected and the extent of involvement of individual vessels has not been studied, and would require the application of recently discovered techniques. The lesions may never be sufficiently extensive to impede the passage of the small volume of blood passing through the lungs in this condition, but after the circulation has been improved

by the Blalock operation or a similar procedure, and despite the high pulmonary arterial pressure, they might, if very extensive, reduce the flow through the lungs.

Two cases representative of the tetralogy of Fallot have come to autopsy after operation and only these cases will be referred to now.

CASE I

This three-year-old child died on the operating table. Only the thoracic contents were made available for examination. The heart showed the usual features: stenosis of the infundibulum was present, but was not excessive, and the aorta did not far over-ride the right ventricle. Projecting into the channel of the narrow passage of the infundibulum were two sessile masses of fibrin about 1 to 2 mm. in diameter, firmly adherent to the thickened, wrinkled, and opaque endocardium. The pulmonary valves were uniformly slightly thickened and the pockets formed by the valve cusps unusually deep, but three cusps were present and there was no fusion along their edges. Detailed histological study showed evidence of older organised fibrin aggregates, and in the more recent lesions only occasional mononuclear cells and fibroblasts at the base of the fibrin vegetation. There were no lesions on any of the heart valves or around the defect in the interventricular septum; the myocardium showed no cellular infiltration; and the endocardium was thin, except in the infundibulum, where there was some slightly irregular lamination of dense fibrous tissue, but little elastic tissue. There is much the same difficulty as Lewis and Grant (1923)⁹ experienced in their study of bicuspid aortic valves of congenital and bacterial origin, but it seems probable that the vegetations superimposed on the congenitally malformed infundibulum should be regarded as non-infective. The occurrence of infection in the conus, along with lesions on the tricuspid valve, is described by Harrison (1929)⁵ and recorded by Abbott (1936).¹

Conditions would seem very favourable for the lodgment of bacteria, and, as an increasing number of these cases are enabled to survive into later life, the incidence of bacterial endocarditis should be carefully studied.

This case died on the operating table. During this operation the lung on the side of the operation is collapsed and the child depends on the opposite lung. In this patient the right lung was collapsed. The right pulmonary artery was a wide channel; the left, supplying the lung and functioning alone during the operation, was narrowed just between its origin from the common stem and the position of the ductus arteriosus. Here it would not pass a probe which easily passed the region of stenosis in the infundibulum, and was obviously incapable of sustaining the pulmonary circulation alone. The cause of this infantile co-arcuation of the pulmonary artery—if it may be so designated—could not be established. The wall was normal, but the adjacent ductus arteriosus contained a calcified thrombus in a lumen, which was closed at both ends. Structural closure of this structure should not normally be associated with thrombosis, and there may have been some growth dysplasia of these two related structures.

CASE II

In the second case there was gross narrowing of the infundibulum, with a fibrous diaphragm marking its junction with the ventricle. A few small vegetations similar

to these in the first case were present on the thickened wall of the infundibulum. There was gross dextroposition of the aorta, and, as well as the high interventricular septal defect, a wide defect in the muscular part of the septum low down permitted much admixture of blood in the ventricles. This must be regarded as a dissociated anomaly. In this case structural changes had closed the ductus arteriosus normally, but large bronchial vessels arising from the aorta were found and must have contributed largely to the blood supply of the lungs. This child survived twenty-four hours after anastomosis of the right carotid to the upper lobe branch of the right pulmonary artery. Thrombus was forming at the site of the anastomosis and in the blind end of the right subclavian, which was also divided, and it is doubtful if the operation would have been satisfactory.

A peculiar finding in this case was an extensive interstitial myocarditis composed chiefly of mononuclear cells, including Anitschkow cells, and a few eosinophils. There was a terminal serous myocarditis, probably the result of terminal circulatory changes, but the cellular process appeared to ante-date the operation. The functional significance of such a myocarditis cannot be assessed, nor can any suggestions be offered as to its ætiology, and it is doubtful if any refinement of clinical examination could reveal its presence. In this case death was largely due to the failure to relieve sufficiently the gross degree of infundibular stenosis.

While the Blalock operation and its variants represent a very great advance in surgery, it is not, and cannot be, the final answer to this anomaly. Modern blood-vessel and cardiac surgery is largely the product of experimental surgery in animals. Operations such as the Blalock procedure and the operations for patent ductus arteriosus and coarctation of the aorta were devised by surgeons trained in the experimental tradition. In the laboratories of experimental surgery the search for a new approach to this problem is being continued. Advances which have been made suggest that real progress in surgery requires, first, a thorough understanding of the disease process, and then well conducted animal experiments.

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Peritoneal Dialysis

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INTRODUCTION

It is the purpose of this paper to draw attention to a method of treatment of acute uræmia, to review very briefly the history of the subject, and to describe a case in which this form of treatment was successfully applied.

Methods of treatment of uræmia, in addition to those directed at the cause, have, in the past, included purgation, diaphoresis and gastro-duodenal suction; venesection; administration of fluids orally, intravenously, and rectally; dialysation by an "artificial kidney" outside the body, first used in experimental animals by Abel, Rowntree, and Turner¹ in 1912; again used by Thalimar² in experimental animals in 1938; and developed and used during the war on human patients by Kolff and Berk³ in Holland; and finally peritoneal dialysis.

(In addition, Thalimar in 1938 employed exchange transfusions between uræmic and normal dogs, but this method is hardly applicable to human patients; and Seligman, Frank, and Fine⁴ in 1945 carried out experiments on urea clearance by irrigation of isolated loops of bowel and by irrigation of the pleural cavity, neither of which was very efficient. Earlier observations on diffusion through the pleura had been made by Starling and Tubby⁵ in 1894.)

HISTORY

The idea of peritoneal dialysis, that is, the elimination of diffusible waste products from the blood-stream through the peritoneum as a dialysing membrane, is not new, but its successful clinical application is comparatively recent. Most of the work has been done in Germany and in America.

As long ago as 1895, Orlow,⁶ a pupil of Heidenhain's in Germany, in a long series of careful animal experiments, in which he injected sera and salt solutions of varying strengths into the peritoneal sacs of dogs, showed that there was an exchange of fluid and of salt, both to and from the blood-stream, across the peritoneal membrane; that hypotonic solutions in the peritoneal cavity decreased in volume and increased in salt content; and that hypertonic solutions at first increased in volume and decreased in salt content, but that the changes in volume and salt concentration were not in accordance with simple osmotic laws. He came to the conclusion that absorption from the peritoneal cavity is a vital process.

In 1923, Putnam,⁷ in America, published the results of a series of experiments, mainly on cats, in which he injected solutions of varying strengths and compositions into the peritoneal cavity, and analysed the chloride, urea, and sugar in the blood and in the dialysing fluid, before and after dialysation.

* Paper read to the Ulster Medical Society on 4th December, 1947.

He confirmed Orlov's observations on the initial changes in hypo- and hypertonic solutions, noted that solutions of any strength were ultimately absorbed, and that, before complete absorption, a more or less complete osmotic equilibrium with the blood plasma is reached; that is, diffusible substances present in excess in the injected fluid diffuse into the blood-stream, and diffusible products present in the blood, but not in the injected fluid, pass out into the peritoneal cavity.

It is to be noted that in some of his animals a higher concentration of urea appeared in the peritoneal fluid than was present in the blood, and that protein appeared in the peritoneal fluid when simple salt solutions were injected. The former may be explained by the limits of error in estimation, but comment will be made on this later. The latter may be an irritative exudation.

Putnam also recovered from the peritoneal fluid such substances as chlorbutanol given into the stomach, and salicylates and other crystalloids given intravenously. When ether was used to anaesthetise the animals, the odour of ether was detected in fluid recovered from the peritoneal cavity.

In the same year, 1923, in which Putnam published his work in America, Ganter,⁸ in Germany, attempted peritoneal dialysation to overcome uræmia in a human patient with chronic nephritis. This attempt failed.

Thereafter, a good deal of animal experimental work on the use of the peritoneum as a dialysing membrane was carried out in Germany^{9, 10, 11} and in America,^{12, 13, 4, 14} and some fifteen attempts to apply the method clinically to human cases were made,^{15, 11, 16} all without success; until in March, 1946, Frank, Seligman, and Fine¹⁷ claimed the first clinical success in their case of a man with sulphathiazole anuria and uræmia, who recovered kidney function after seven days of peritoneal irrigation with modified mammalian Tyrode's solution, and the following month the same authors⁴ reported their earlier experimental work, in which they kept bilaterally-nephrectomised dogs alive for periods of up to thirteen days, with azotæmia completely controlled by intermittent peritoneal irrigation. Untreated dogs usually die in uræmic convulsions in three to five days. These authors report that urea clearance through the peritoneum averaged seventy-two per cent. of the normal renal urea clearance for dogs.

In November, 1946, Reid, Penfold, and Jones,¹⁸ in England, reported in the "Lancet" a case of acute anuria with uræmia, following incompatible blood transfusion, successfully treated by bilateral renal decapsulation and peritoneal dialysis. As it was this report which drew my attention to this method of dealing with acute uræmia, and as it was a modified form of the technique of Reid, Penfold, and Jones that I have since used, I will very briefly describe their method. After renal decapsulation they inserted a self-retaining catheter through a small incision at the extreme anterior end of the left renal incision. To this was attached a dripper arrangement, whereby twice-normal saline solution, with penicillin, was run into the peritoneal cavity at sixty drops per minute.

When ascites had developed, the dialysate, with a high urea content, was withdrawn through the same catheter and the process was repeated. Only about half the volume of fluid run into the peritoneal cavity was recovered. The blood urea level

fell during dialysis, kidney function returned, and dialysis was discontinued on the third day. A secondary rise in blood urea then occurred and thereafter there was a steady fall to normal levels as kidney function improved.

So far as I am aware, apart from a case reported in 1938 by Wear, Sisk, and Trinkle¹⁹ of anuria due to bladder calculus, in which the obstruction was relieved by catheterisation and suprapubic cystotomy, with subsequent profuse diuresis, and in which the role of peritoneal dialysis was less clear cut than in the other recorded cases, these two and one further success subsequently reported from America²⁰ were the only reported successful cases of peritoneal dialysis in human patients before the case I am about to describe, although in September, 1947, Buckley and Scholten²¹ reported that in August, 1946, they had, in a case of mercury poisoning, by peritoneal lavage with modified Tyrode's solution for twelve days, maintained life for twenty-six days after complete renal shut down lasting six days, thus considerably delaying, but not preventing, a fatal issue.

CASE REPORT

The present case is that of a woman of 62 years who was admitted to the Royal Victoria Hospital, Belfast, on 4th June, 1947.

She had had a calculus removed from her right kidney twenty-one years previously, and nine years previously had undergone right nephrectomy for stone.

For three weeks before admission she had severe, intermittent colicky pain radiating from the left renal angle to the groin, at times necessitating morphia for its relief. During this period there was increasing oliguria, and she had passed only a very few ounces of urine during the two days preceding admission.

On examination, she was found to be a stout woman, showing some evidence of anaemia, no cyanosis, and no oedema. Straight X-ray of the abdomen showed no evidence of calculus, but in view of the history and the fact that her pain had disappeared on admission, she was thought to be a case of renal colic, due to a small stone which had been passed and had escaped detection, with resulting reflex suppression of urine.

On her first hospital day she passed no urine. On the second day she was catheterised and 1½ ounces (43 ml.) of urine were obtained. No further urine was passed that day, on which the blood urea level was 141 mg. per 100 ml. One pint (568 ml.) of 4.2 per cent. sodium sulphate solution was given by intravenous drip and this was followed by intravenous 5 per cent. glucose solution at forty drops per minute.

On the third hospital day anuria was still complete. At 2.30 p.m. the ureter was catheterised by Mr. T. B. Smiley and the renal pelvis was washed out with 3.8 per cent. sodium citrate solution without result. The ureteric catheter was left in position and through it the renal pelvis was washed out with 5 ml. of sodium citrate solution every three hours. The intravenous glucose solution by slow drip was continued.

By 11.30 p.m. there was still no passage of urine and the patient was showing signs of uraemia: there was some vomiting, much retching, a troublesome hic-

cough, marked drowsiness and mental confusion, and complaint of extreme fatigue : it was decided to institute peritoneal dialysation, as the woman appeared to be dying.

The abdomen was flaccid, and, as it was desired not to risk perforating either the cæcum or the descending colon by entering through either iliac fossa, a small incision was made through the skin and superficial fascia in the mid-line below the umbilicus, and through this a trochar and cannula were introduced into the peritoneal cavity.

A self-retaining rubber catheter was then inserted through the cannula (which was then withdrawn) and to the catheter was attached a drip apparatus running in twice normal saline at the rate of sixty drops per minute. Penicillin was added to the saline solution in the proportion of thirty thousand units per pint (568 ml.) as a prophylatic against peritoneal infection. By this time eight pints ($4\frac{1}{2}$ litres) of five per cent. glucose had been given intravenously, and this was now discontinued.

Early the next morning the patient passed a few ounces of urine, and by midnight the following night had passed fifty-seven ounces ($1\frac{1}{2}$ litres).

At 1 p.m. $2\frac{3}{4}$ pints ($1\frac{1}{2}$ litres) of saline solution had been run into the peritoneal cavity, but, owing to the mid-line position of the catheter, only $\frac{1}{2}$ ounce (14 ml.) could be recovered. On analysis, this sample showed a urea content of 156 mg. per 100 ml. Blood taken at the same time contained 170 mg. of urea per 100 ml.

At midnight $5\frac{1}{4}$ pints (3 litres) of fluid had been run into the peritoneal cavity and the patient had an obvious ascites. One ounce (28.4 ml.) was recovered and contained 260 mg. of urea per 100 ml.

At 9 the next morning, the fifth hospital day and the second day of dialysation, a further pint (568 ml.) of intra-peritoneal fluid had been given. The patient was clinically very much better and was now passing urine freely. The intra-peritoneal drip was discontinued. A sample of peritoneal fluid ($\frac{1}{2}$ ounce; 14 ml.) removed at 12 noon showed the astonishing urea figure of 750 mg. per 100 ml.

The patient continued to improve clinically for a further four days, and continued to pass increasingly copious amounts of urine. The blood urea fell to 104 mg. per 100 ml. on the sixth day and to 80 mg. per 100 ml. on the ninth day after admission.

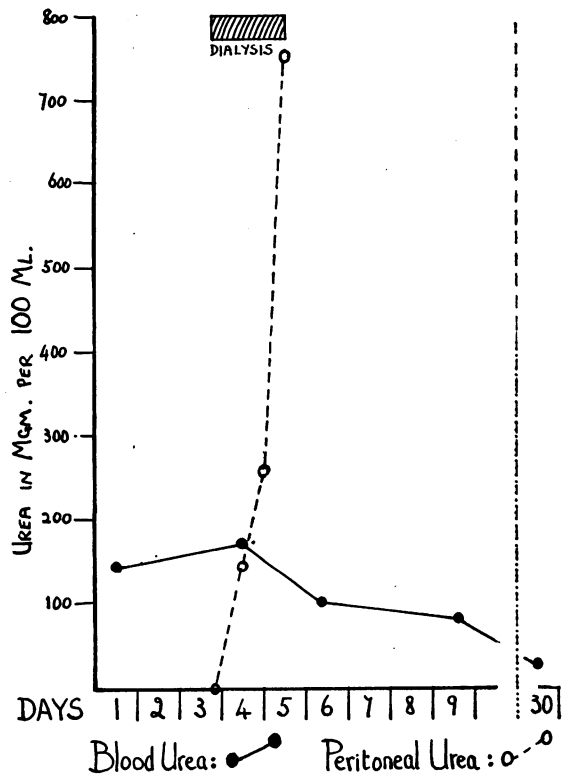
The next afternoon she had a rigor, with recovery to well-being in fifteen minutes, and this was repeated the following day. Intra-muscular penicillin and sulphonamide therapy was commenced and two ounces (57 ml.) of foul-smelling purulent urine were obtained by catheter; from this bacillus coli grew copiously. Forced fluids were given by mouth and were well tolerated, and the patient rapidly recovered from this complication—a good urinary output being resumed.

On 16th June the blood urea was 81 mg. per 100 ml. and on 3rd July it had fallen to 27 mg. per 100 ml. (see graph, page 183).

The patient had for some years been suffering from hypertensive heart disease and bundle branch block, and had not walked for three years. However, it was felt

that a little gentle exercise would do her good : she was encouraged in this belief, and on her discharge on 5th July, after a stay of four and a half weeks, she walked out of hospital.

She was seen again one month later as an out-patient and had remained well, except for very slight swelling of her ankles toward evening if she stayed on her feet too long or walked too far:



COMMENT

I should like to make a few brief comments on this case.

Firstly, as I have said, owing to the mid-line position of the single catheter, only small samples of peritoneal fluid could be obtained. This meant that when the kidney resumed function it had to cope with waste products re-absorbed from the peritoneal sac as the fluid absorbed, in addition to those already present. When ascites had developed I was prepared to put a second catheter into the right iliac fossa to drain the fluid off, but the patient's condition improved so rapidly once diuresis commenced that this was unnecessary. However, I decided that in any future cases, once a good "head" of ascitic fluid had developed, that I would use a second outflow catheter. This seemed to offer several advantages over the single catheter method :—More complete removal of fluid would be possible and the secondary rise of blood urea after dialysation was discontinued, as described by

Reid, Penfold, and Jones, would be avoided; the peritoneum would be constantly bathed in a slowly-changing fresh dialysate and thereby a more constant and more rapid removal of waste products would be effected; and sudden intra-abdominal pressure changes would be avoided.

I did, in fact, have an opportunity of trying out this method in two subsequent cases. Mechanically, the dialysation was efficient, but unfortunately it was not effective in saving the life of the patient in either case. In each case the doctors in charge felt that the patient was dying, but thought that if uræmia could be controlled there might be a chance of survival, and I was asked about dialysing the peritoneum to this end.

The first of these, whom I saw at the City Hospital on the invitation of Dr. C. M. B. Field and through the courtesy of Dr. S. R. Armstrong, was a boy of 12 with acute nephritis, anuria, and œdema. A concentration of 200 mg. of urea per 100 ml. was reached in the first pint of peritoneal fluid withdrawn, but despite intravenous therapy, including slow-drip blood transfusion, the boy, who was also anæmic, died, apparently of circulatory failure, on the third day.

The second case, whom I saw on the invitation of Dr. Douglas Blair, through the courtesy of Mr. Cecil Calvert, was a man of 27 who had been operated on for a brain tumour five days before, with oliguria since operation, and a rising blood urea which had reached 400 mg. per 100 ml.

There was in this case some difficulty in withdrawing fluid through the outflow catheter in the right iliac fossa, which blocked from time to time, presumably by omentum or bowel floating against the end of it. There was also considerable leakage round both catheters.

The figures are shown in the accompanying table. As can be seen from the table, considerable quantities of urea were eliminated from the blood-stream, and death on the seventh post-operative day, the third day of dialysation, was, I think, attributable to the brain tumour.

Date				B. Urea	P. Urea	Fluid In	Fluid Out
6th	-	-	-	400	—	—	—
9 p.m. 6th to 9 p.m. 7th	-	-	-	250	440	3,500	1,000
9 p.m. 7th to noon 8th	-	-	-	360	440	2,500	1,000

Died 8/11/47 at 12 noon.

Later, I found that Seligman and other workers in America^{4, 17} had employed two abdominal catheters with a suction apparatus attached to the outflow, the irrigation of the peritoneum being continuous. In Seligman, Frank, and Fine's successful case the rate of flow was 25 ml. per minute, but from data obtained from three other (unsuccessful) cases²³ they conclude that the optimum rate is between 40 and 60 ml. per minute.

The second point I wish to comment on is the use of twice normal saline. I used this, without, I must confess, fully understanding why, because it had been

employed by Reid, Penfold, and Jones, whose report was, up to that time, the only one I had seen on the subject.

From a study of the literature it would appear that isotonic solutions are those of choice, but that if there is much œdema, hypertonic solutions may be temporarily employed.

If Ringer's or Tyrode's solutions are not readily available I would suggest the use of normal saline, which is easily and rapidly made up. If dialysation is continued for more than twenty-four to forty-eight hours, Ringer's or Tyrode's solution should, if possible, be used, and heparin should be added to prevent fibrin deposition. In addition, vitamins and glucose may be given by this route.

Thirdly, I want to say a word or two about the astonishing urea figure of 750 mg. per 100 ml. which was recorded in one of the samples of peritoneal fluid from the case I have described.

Dr. Shrager, who was responsible for the biochemical analyses, put the limits of error in estimation at a maximum of 50 mg. per cent. either way. In face of this I have sought, largely in vain, for an explanation of a peritoneal fluid urea figure some four times the concentration of the highest recorded blood-urea level. I would put the following suggestions to you (for some of which I am indebted to Professor Henry Barcroft):—

- (i) An error in estimation.
- (ii) A sudden, temporary, undetected rise in blood urea.
- (iii) An isolated pocket of fluid in the peritoneal cavity with a high urea concentration, left behind when absorption of the remainder had largely taken place.
- (iv) A faster absorption of water than of urea, with dilution of blood to "pre-œdema" level.
- (v) A selective excretion and absorption mechanism in the peritoneum.

On this last suggestion there are some points to record:—

- (a) Orlow⁶ in 1895 noted that absorption through the peritoneal cavity is not quite in accordance with simple osmotic laws, and concluded that it was a vital process.
- (b) Putnam⁷ in 1923 confirmed this observation and discussed the possibility of "vital activity" on the part of the peritoneum.
- (c) In the other two cases recorded here a higher concentration of urea was reached in the peritoneal cavity than was ever recorded in the blood. In Mr. Calvert's patient a peritoneal level of 440 mg. per cent. was reached when the blood level was 250 mg. per cent.
- (d) Inside the swim-bladder of the fish—a membranous structure not unlike the peritoneum and through which substances in solution can diffuse—there is maintained a far higher concentration of nitrogenous products than anywhere else in the fish.
- (e) In pregnancy, glucose is found in the blood of both mother and foetus, but fructose, which is present in significant amount in the blood of

the foetus, does not pass the placental membrane, for it is not found in the maternal blood.

There does thus seem to be some evidence that living membranes can exercise some selective action on the passage of diffusible substances through them.

The last point I want to discuss is that of complications :—

In the first case which I have described a bacillus coli infection of the urine occurred; this is, I think, attributable to the indwelling ureteric catheter, which it is almost impossible to keep aseptic. The infection was controlled, fortunately, by sulphonamides and a high oral fluid intake.

In two cases recorded in the United States^{17, 20} infection of the peritoneum with gram-negative organisms occurred and was combatted by the administration of streptomycin—not yet generally available in this country.

In any of these cases, and, I think, especially if hypertonic solutions are used to excess, there is always the possibility of upsetting the delicate balance of the body metabolism.

I believe that such risks, however, should not prohibit the use of this method if the occasion demands it.

CONCLUSION

In conclusion, in acute uræmia, where there is reason to believe that kidney function may recover if the patient can be kept alive long enough for this to occur, any method which tides the patient over the uræmia itself whilst treatment is directed to its cause, may be life-saving, and peritoneal dialysis seems to offer the most efficient readily-available method. (It remains to be seen whether mass production of Kolff's artificial kidney will eventually take its place in hospital practice, but peritoneal dialysis is at present at least a much easier procedure to institute.)

Such causes of acute uræmia as anuria due to sulphonamides, incompatible blood transfusion, renal calculus, surgical trauma to the renal tract, the crush syndrome, mercury poisoning, and some cases of acute nephritis at once suggest themselves as suitable for this form of therapy, which, however, should probably not be instituted until other forms of treatment have failed to evoke a diuresis.

I wish to express my thanks to Dr. S. I. Turkington, for permission to treat and report this case; to Dr. S. R. Armstrong and Dr. C. M. B. Field and to Mr. Cecil Calvert and Dr. D. Blair, for allowing me to see their patients, for clinical notes, and for permission to comment on them; to Dr. J. Schrage, for the biochemical analyses; and to Mr. T. B. Smiley, who catheterised the ureter.

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NOTE.—The German papers have not been read by me, but were quoted by several of the other authors referred to.

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REVIEW

A WAY TO NATURAL CHILDBIRTH. By Helen Heardman. Edinburgh : E. & S. Livingstone Ltd. 7s. 6d.

THIS little book sets out clearly and precisely the methods by which the expectant mother may be trained in the practice of relaxation in labour. The author makes the preparatory exercises simple to understand—the book being intended for the use of both mother and physiotherapist.

The procedures adopted are closely in line with the teaching of Dr. Grantly Dick Read, and the reader is impressed with the amount of preparation given to the expectant mother for her labour.

Mrs. Heardman includes statistics on the effect of relaxation in lessening the incidence of abnormalities during and after labour, and a chapter on the views of mothers who have experienced labour by this method.

Whatever our views on this subject may be, this book is well worth study.

R. A. E. M.

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REVIEW

A WAY TO NATURAL CHILDBIRTH. By Helen Heardman. Edinburgh : E. & S. Livingstone Ltd. 7s. 6d.

THIS little book sets out clearly and precisely the methods by which the expectant mother may be trained in the practice of relaxation in labour. The author makes the preparatory exercises simple to understand—the book being intended for the use of both mother and physiotherapist.

The procedures adopted are closely in line with the teaching of Dr. Grantly Dick Read, and the reader is impressed with the amount of preparation given to the expectant mother for her labour.

Mrs. Heardman includes statistics on the effect of relaxation in lessening the incidence of abnormalities during and after labour, and a chapter on the views of mothers who have experienced labour by this method.

Whatever our views on this subject may be, this book is well worth study.

R. A. E. M.

The Open Window

By ROBERT MARSHALL, M.D., F.R.C.P.LOND., F.R.C.P.I., D.P.H.

A Paper read to the British Tuberculosis Association at its Annual Meeting in Belfast, in June, 1948

SOME months ago Dr. Brice Clarke invited me on your behalf to be present at this meeting and gave me the privilege of addressing you on some subject of local, medical, historical interest. A few days later I received a very kind letter from Dr. Stephen Hall, in which he indicated his belief that the Belfast Medical School had produced some notable and eccentric figures in the last century, and suggested that one or more of these might form a fit subject for a short paper. My first reaction was to agree at once that our school had produced some *notable* characters, but I wondered just what he meant by the word *eccentric*, so I looked it up in a dictionary and found the following definition: "not conforming to the ordinary rules of conduct; out of the ordinary, odd, original, whimsical; so odd, and so different from others as to be considered strange in the head; slightly crazy." It was, on the face of it, scarcely complimentary to us to suggest that we had a large proportion of doctors who were slightly crazy, but in all fairness to Dr. Hall, we must admit that he credited us with at least an equal number who were notable. It occurs to one, too, that sometimes that which is regarded as eccentric or even slightly crazy in one generation, may be strictly orthodox in the next; and that is one reason why I should like to talk to you for a little while this evening about Dr. Henry MacCormac, who was considered by many during his own life-time to be eccentric, but who was a very great man and a notable physician in this or any age.

Henry MacCormac was born in County Armagh in 1800 or 1802, the son of John MacCormac, a linen-merchant, who was the son of Cornelius MacCormac, an officer in the Royal Navy. He was almost certainly a pupil of Armagh Royal School, but has left it on record that he had few grateful memories of his pupilship.¹ The Royal School's list of scholars of that period is not available. He qualified in medicine in Edinburgh University in 1824 and studied in Dublin and Paris as well. He then went on a visit to Africa, journeying from the Cape of Good Hope to Sierra Leone overland, and nearly succumbed to an attack of jungle fever on the way. He also visited America twice before he commenced practice in Belfast, where he was appointed a physician to the Belfast General Hospital, which is now the Royal Victoria Hospital, in 1830. It may have been because of his experience in tropical diseases that he was given the task of taking charge of the special hospital for cholera in the 1832 epidemic. "In the autumn of 1830," as Dr. A. G. Malcolm² has recorded, "intelligence reached these shores, that the Asiatic cholera had crossed the Russian frontier and was steadily marching in a

westward direction. Even then, and when this news was confirmed by subsequent accounts of its appearance in Poland, Austria, and Prussia, the public mind in these countries was scarcely roused to any degree of excitement," but with its onward march "the interest in the cholera news-columns fearfully increased and when, at length, the enemy suddenly appeared at Sunderland, a sense of impending danger sank into every heart." In Belfast a sum of £700 was raised and a cholera hospital, providing for fifty beds, was erected at the rear of the fever hospital in Frederick Street. Another building for the seclusion of contacts was rented and other precautions were taken. Four months elapsed, however, before the first case was recognised. There is a curious discrepancy here, because Henry MacCormac wrote that it was in a man who had arrived from Glasgow, but A. G. Malcolm stated that no trace of contagion could be ascertained in its origin. By the end of 1832, 2,870 persons in Belfast had been attacked, with 480 deaths. Of these, MacCormac claims that 726 patients were under his personal care, of whom 173 died, giving a death rate of twenty-two per cent. He probably got the worst cases in hospital, as the general death rate in the city was sixteen per cent., which compares very favourably with the figures recorded by Underwood³ for the English and Scottish cities and towns. Malcolm refers to Doctor Hawthorn's opiate and astringent treatment as generally successful, nearly always so in the early stage, and adds that Dr. MacCormac's Indian mode of treatment had also a large share of success. In MacCormac's *Methodus Medendi* (1842) we find a clear clinical picture of cholera, inset, as was his habit, with many names of authorities to concur with, or to contradict calmly and with grave assurance. He was right to agree with those who ascribed it to "contagion," but his "Indian treatment" by blood-letting, calomel, opium, and brandy would not meet with approval nowadays; though he was careful to explain that blood-letting is contra-indicated in collapse, where warm air baths are given with advantage. He was enthusiastic in his advocacy of dilute sulphuric acid as a prophylactic and claimed that its routine use during epidemics prevented any deaths from cholera from occurring in the Belfast Lunatic Asylum.

His treatment of cholera certainly met with popular approval, for his fellow citizens expressed their gratitude by giving him a handsome testimonial in recognition of his services.

In 1833 Henry MacCormac married his first cousin, Miss Mary Newsam. There were two sons and three daughters of this happy marriage: one became Sir William MacCormac, President of the Royal College of Surgeons of England. Three grandsons also became doctors: Dr. Henry MacCormac, now Consulting Dermatologist to the Middlesex Hospital; Dr. H. R. Dean, Professor of Pathology at Cambridge and Master of Trinity Hall; and Colonel Henry Burden of the Indian Medical Service.

Here I am tempted to digress to tell you something of the Belfast General Hospital, now the Royal Victoria Hospital. Founded as a Dispensary in 1792, it had suffered many vicissitudes before 1817, when its New Hospital in Frederick Street was opened and dedicated with solemn ceremony "To the sick, to the art of medicine, for the public health, for the cure of diseases, for the solace of

suffering, and for the practice of medicine and surgery." In 1820 resident pupils, the apprentices of members of the staff, were first admitted. More than one hundred years were to elapse before the General Medical Council of Great Britain and Ireland was to recognise the value of resident pupilship for medical students and to make it compulsory for all of them. In those days Ulstermen went in considerable numbers to Dublin and to Edinburgh, and it is sad to read in a letter written by one of them in Edinburgh that "to be a student of medicine is a term of contempt; but to be an Irish student of medicine is the very highest complication of disgrace."⁴ It was in 1835 that a medical school was opened in connection with the Royal Belfast Academical Institution, the first Professor of Medicine being Dr. Henry MacCormac. In those days there was no rigid barrier between consultants and general practitioners, and doctors were elected to serve on the staff for the relief of the sick poor for a four-year period. Some of them appear to have been re-elected for considerable periods before being promoted to the Consulting Staff. It is interesting to us that this rule has never been rescinded and members of the staff of some Belfast hospitals are still re-elected every four years without being aware of the existence, or much less the origin, of this old rule. MacCormac was honorary secretary of the staff in 1833 and 1836. In his staff report,⁵ signed by him in 1833, he begged "leave to advert to a delicate subject, but one of great importance—the examination, namely, of the seats of disease after death. If," he said, "the derangement of the comparatively simple machinery of human construction cannot be ascertained or remedied without an inspection of the evil, still less is it possible in the case of the infinitely more elaborate details of the human frame itself . . ." In 1836 he showed,⁶ as he so frequently did throughout his life, a glimpse of the shape of things to come when he wrote: "the writer is of the opinion that this and all similar institutions might be managed with much economy by a General Administration for the Charities of the town . . ." perhaps the first forewarning of the advent of the Hospitals Authority. In 1836 he was promoted to be Consulting Physician to the hospital, and I have yet to discover what the duties of Consulting Physicians were in those days. Some of them appear to have continued their hospital work in the same way as the visiting physicians, and Henry MacCormac seems to have enjoyed a very busy private practice. In 1849 he was appointed physician to the Hospital for the Insane, where he instituted many reforms, notably in providing a more generous diet and in advocating more humane and understanding treatment of insanity. He published his views in a short pamphlet entitled "Metanoia, A Plea for the Insane," in 1861, in which he stated that insanity is not a disease of the brain substance, but that the evil lies in quite other than empirical conditions, resides in the mind's unconsciousness of its consciousness, in a word, the soul's unawareness of its own acts. In his paper, read at the Annual Meeting of the Canadian Medical Association in 1933, Sir Humphry Rolleston⁷ quoted this extract and described it as "an anticipatory echo of Freud, and later psychology," but remarked that MacCormac did not define what the term metanoia means. It is, as you know, a Greek word still used by theologians, meaning repentance or a change of heart. In 1849 Queen's College, Belfast, was opened by its Royal Founder, Queen Victoria. Dr. MacCormac appears to have

handed over his professorial office to Dr. J. C. Ferguson, until then Professor of Medicine in Trinity College, Dublin.

In 1866 he retired from active practice to devote the last twenty years of his life to literary studies. Perhaps it was this severance from hospital practice which forms the only excuse for the Board of Management of the Royal Hospital for having omitted any reference of his death in their annual report for 1886. In this annual report the deaths of five Life Governors were noted and reference made to improvements in the wash-house, but there was no word for Henry MacCormac; and few there were who remembered the cholera epidemic of 1832, when the gallant young doctor had earned high praise.

This gives you a brief outline of his hospital career, but it is on his work on tuberculosis that his fame most surely rests. It was in 1855 that he published his book "On the Nature, Treatment, and Prevention of Pulmonary Consumption, and, incidentally, of Scrofula, with a Demonstration of the Cause of the Disease." This slim volume of one hundred and eleven pages is a *tour de force*. It presents not only a clear statement of the author's dogmatic views, but a clear image of his lively mind and the depth and width of his learning. There are one hundred and twenty-eight references to authority scattered through the text, with quotations ranging from Hippocrates, Celsus, and Galen, to Benoiston de Chateauneuf and William Stokes. It is to Baudelogue (1832) and Fourcault (1844) that he gives his highest praise for their emphasis on the importance of impure air as a cause of consumption. Throughout the text he omits inverted commas as he quotes from this or that foreign author. This typographical habit seems to portray the ease with which he merged from English in his own thoughts, for was he not familiar with twenty languages? Since it was his advocacy of fresh air in the prevention and treatment of tuberculosis which constituted his claim to our special remembrance of him, I should like to read to you some short selections from this little book. As Sir Samuel Wilks has said many years ago, it shows how strong his views were on the subject and yet very remarkably their value was not perceived by the profession at large. Nor did the medical press acclaim it. "The Lancet" admitted that the author was a learned man, but declared that he was "not a sound guide in purely medical matters.⁸ But "The Lancet" is not always right. On the first page the author gives his declaration of faith in the following terms:—"It is the state of the indoor air, and very particularly the bedroom air, and not the condition of the outdoor atmosphere at all, that is to account for the production of the malady. A sufficiently renewed indoor atmosphere, and particularly a sufficiently renewed bedroom atmosphere, together with active, and particularly active, outdoor habits will render life wholesomer in general and freer from consumption, even in towns, than it will prove in the most admirable circumstanced country residence with ill-aired rooms and passive, inactive habits. For action, coupled with a pure atmosphere, tends to life and health, whereas inaction and unrenewed, rebreathed atmosphere but insure irreversible decay and death."

Then follows his theory of the nature of tubercle:—

"Tubercle is no other than the arrested, because unoxidized, carbonaceous

waste; in fine, the detained metamorphic refuse of the living organism, detained by reason of imperfect, defective respiratory function."

And again:—

"These tuberculous deposits must be considered ramifications of one great malady under varying aspects and manifestations as arising from retention in the system of the unburnt metamorphic carbon waste."

"Neither inflammation, nor cold-taking, nor starvation, nor inferior nutriment, nor dyspepsia, nor chills, nor deficient clothing, nor excessive moisture, nor low spirits, nor bodily inaction, nor the suppression of eruptions, nor the retention of habitual discharges, nor exhaustion, nor abuse of mercury, nor intemperance, nor supposed hereditary tendencies will in any case lead to phthisical or scrofulous deposits if there be not a tubercular habit of body to superinduce them.

"If his syntax derives from the splendours of St. Paul, his thesis is modern and psychosomatic.

"There is this to be said in respect of tubercle; that it is an entirely foreign and unnatural product . . . It has no normal existence anywhere, and only makes its appearance as the result of a profound and deeply-seated degradation in the vital functions of men and animals."

"When people insist on the hereditariness of consumption, why do they not insist on the far more certain hereditariness of health? For health is assured by heredity, although consumption be not so."

"The mainly unreasoning dread of night air, so termed, is a great impediment to free ventilation by night. And yet day and night air is the same virtually and does not differ appreciably. The air by night, whether damp or dry, is equally pure, equally salubrious with the air by day, and asks not less solicitously for ceaseless admission into our dwellings."

The author then gives his personal experience:—

"I wrote to ask the excellent master, when my son went to Queenwood College, to permit his windows to remain open at night. 'Certainly not,' was his reply, and so the upland Hampshire breezes vainly wooed the casements for access to the panting lungs within. My son afterwards proceeded to Germany, well and duly impressed with the importance of renewed night air. The folding casements, both of them, of his sleeping room he kept widely open the winter through, to the perfect horror of the good German parents who son had perished of closed windows in the very same chamber which my boy occupied. Night after night the contents of the water-jug, he told me, were frozen. Yet never did he experience a chill, never took what is vulgarly called a cold."

"When at school in Paris, it was only by engaging a chamber for their exclusive use, overlooking the vines and the flowers, that the really intelligent principals would suffer my girls to keep their windows (they were the usual French casements) open. I suppose this was the only girls' sleeping chamber in Paris, perhaps in the whole of France, where two French windows were kept widely open, winter and summer, the whole night through. I was sorry when I looked at the other young people, and tried hard to obtain for them a similar boon."

"Pure respiration is the law of life; impure respiration is the law of death. One

is immunity and health and strength as, *quo ad*, the other is defeat and destruction and doom."

I feel that many of us will approve of his clinical observation contained in the following abstract:—

"Here I must expressly observe that the sounds of a lung containing a few merely solitary or scattered tubercles do not necessarily differ from those of the healthy lung. In short, tubercles do not always afford a sign. This fact is also distinctly affirmed by Skoda, Andral, and others. It is owing to the circumstance of this important fact being overlooked that many have been pronounced exempt from tubercles who really laboured under them. In fine, the stethoscope is not in each and every case the criterion which the public, and even the profession, are wont to imagine. I have often met cases of evident phthisis, evident from the rational signs, in which neither auscultation nor percussion sufficed to declare the existence of tubercles."

This was the gospel which MacCormac felt himself ordained to preach in season and out of season. He read papers on the subject in Belfast, in Dublin, in Glasgow, and, unfortunately for his own happiness, in London, where in May, 1862, his paper was read to the Medical and Chirurgical Society, in his unavoidable absence, by Doctor Sieveking. Its reception may be best described by the following extract from "The Lancet"⁹: "This paper, which was of considerable length, set forth the foregoing thesis, and wound up with some comments on the ravages of consumption and scrofula, which, the author asserted, follow entirely from the respiration of a befouled and impure atmosphere. The air by day, if possible, and assuredly, by night, should be as pure as that which traverses the hill-top and is washed by the sea-wave. He would as soon send an infant to sleep in a cellar as in a airless nursery, and he considered there could be no immunity from the twofold scourge of phthisis and scrofula until medical practice and popular conviction concurred alike as to the indispensableness of fresh, untainted air.

"Doctor Chambers characterised the paper as a waste of time. It simply stated that closed rooms, foul air, and other injurious influences favoured the production of consumption. All knew this before, and it was a waste of time to enlarge upon a truism.

"Doctor O'Connor inquired whether the paper had been referred to a committee previous to its being read to the Society?

"Dr. Tanner said it would be desirable that the Fellows should be made acquainted with the papers to be read on certain evenings; Dr. MacCormac's views on the subject of phthisis were well known and were more than five hundred years old. He had advanced no facts in support of his theory, and he contended that the Society had wasted its time in listening to the statements which had been made. It was not to be wondered at that the Society's meeting-room was empty if such papers were submitted to the consideration of the Fellows.

"Dr. Little said he must press the question as to whether the paper had been referred to a committee. The Society ought to be protected against the reading of such productions. The president said that it was not the custom of the Society to refer papers previous to their being read. It was not competent for the members

to discuss any question which did not relate to the paper before them. Mr. Ashton concluded that the Society refused to pass a vote of thanks to Dr. MacCormac."

But this thankless thesis was not the only contribution to the evening's proceedings, for it was followed by a paper from Dr. Thomas Bollard "On a previously unobserved cause of idiocy, imbecility, and allied affections," which turned out to be "fruitless infantile sucking," and it met with a much less hostile reception from the learned Society.

Time passes, and it is just possible that the only mention in medical literature of Drs. Chambers, O'Connor, Tanner, Little, and Mr. Ashton is this permanent recording of their rudeness to Henry MacCormac. It rankled in the old man's mind, however, because in 1883, when nearing the end of his long, useful life, he addressed a pamphlet to the Medico-Churgical Society which had treated him with such contumely twenty years before, drawing their attention to the "Air Cure practised at Davos and the Engadine," whose "mountain miracles are in perfect accord with the statements to which your rampant associates yielded so churlish a reception."

If rejected in London, his views were appreciated elsewhere. A second and larger edition appeared in 1865, and he had the pleasure of reading translations of his work on consumption in German and Dutch. Even at home, as can be imagined, there were times when, like Hudibras, he had to resort to "apostolic blows and knocks." It has long been a tradition that he appeared in the Belfast Police Court and paid a fine for breaking his patient's window with his umbrella to ensure the admission of fresh air. I have failed to trace any actual proof of this, but his grandson, Dr. Henry MacCormac, writes to say that "the police court story has all the flavour of antiquity; I have always believed it as true, but I have no proof except family tradition. I don't think it was invented as a joke, as fresh air was no joke in my family." Perhaps an even more attractive story is that of the policeman on night patrol in Belfast wakening Dr. MacCormac to report that Miss Maiy's window wasn't open.

It was, as you will remember, in 1882 that Robert Koch discovered the tubercle bacillus. Is it to be wondered that the old man refused to accept this bacterial cause for consumption or to withdraw the challenge which he had voiced so many years before when he said "if I had a stentor's voice, an angel's pen, I should employ them to enlarge on views which, with my firmest convictions, I believe to embody the safety and material healing of our kind"?

I would not like you to think, however, that Henry MacCormac was so obsessed by his crusade for fresh air as to have little concern for anything else. The width of his many interests is indicated by the list of the books, pamphlets, and newspaper articles which flowed profusely from his pen. Some of these, of course, were purely medical, of which the longest was his "Methodus Medendi or Description and Treatment of the Principal Diseases Incident to the Human Frame"; there were also his shorter treatises on Typhus Fever and on Asiatic Cholera. His exposition of the Nature, Treatment, and Prevention of Continued Fever, published in 1835, asks the question "is it not extraordinary that no Ministry of public health exists, of which medical men should form a part? If the

community had the same faith in the preventive as in the saving power of medicine—and it surely merits at least equal confidence—such a function as the above would soon be called into existence.” As Sir Humphry Rolleston points out, it was not until 1919, eighty-four years after MacCormac spoke, that the Ministry of Health was established. In 1837 there appeared his “Philosophy of Human Nature in its Physical, Intellectual, and Moral Relations.” To our modern eyes this book may be a little didactic and even sententious, but in this, as in all his writing, there gleams his unswerving faith in the goodness of God and in the perfectability of man. He anticipates the spirit of Mr. Churchill’s immortal phrase that “we are part of an unfolding purpose,” and it is characteristic that he prefaces his book on consumption with a quotation from Descartes: “If it be possible to improve the human species it is in the art of medicine that we must seek the means.”

Perhaps the dermatological genius of his grandson derives from the urge which made the grandfather write a short treatise on “The Treatment of Porrigo and Tinea Favosa by Petroleum.”

He had early shown evidence of a *cacæthes scribendi* and a desire to share his knowledge with others. When a young man in New York, he had heard that a Mrs. Leigh had discovered a cure for stammering, and, as this remedy was a secret, he tried to find a cure himself. After much consideration he decided that the basic fault was in attempting to speak when the lungs were empty, with associated factors of undue haste and “imitation,” and published a small book on the subject. This was, I believe, his first published work and I should like to read you one or two extracts from it:—

“It is somewhat remarkable that all the French writers who have touched upon this subject have asserted that they have seldom seen an example of females affected with stuttering, and one in particular, Monsieur Itard, affirms that he never saw an instance of it in his life, nor does he even believe that they are subject to it.

“Certes, it must be rarer, in this case, in France than in England; but I have, nevertheless, seen more than one instance of women who were stammerers, although I readily admit that it is much rarer in them than in men; I do not, however, claim any originality in this remark. And here I may observe that the French, in the fulness of that gallantry and devotion towards the fair sex, for which they are so deservedly remarkable, have taken an opportunity of paying them an extraordinary compliment by asserting that they are never subject to such a disgrace (I use their own expression). Some indeed admit, with a sort of reluctance, however, that they have met, now and then in their lives, an instance of a lady subject to stammering.

“The reasons why females are less subject to the vicious habit of stuttering are not a few. Their education is different from that of men. They think more, and at an earlier period, than men do. They are brought more into society and communion with their fellow women, and their minds are seldom perplexed by application to business or deep study; and indeed, from the peculiar aptitude of their organization, which seems expressly designed by their Creator, they in general converse with infinitely more ease than men do. Add to this, that from the nature of their lives and habits, not being distracted as men are by multitudinous occupations, they

converse on a thousand things which men would not think of doing. But there are many exceptions on both sides: there being men whose volubility of utterance exceeds that of the generality of women; and women whose taciturnity of disposition is much greater than that of the generality of men. These exceptions, nevertheless, depend upon the education and disposition of the subjects; and, I may here remark, that the mere mental distinctions between the sexes seem to be every day gradually decreasing, which approximation may advance to a certain point, unquestionably with advantage to both. As partly illustrating one of the preceding remarks, I may mention that it is a subject of observation in France that, since the origin of theatrical exhibitions, there have been many more good actresses than actors.

"With regard to stoppage of speech in men, M. Voisin, from whom the last observation is taken, affords me another amusing instance of a kind of pardonable egotism. He says, that in those persons in whom the habit is very slight, it adds a kind of inexpressible grace to their conversation, which is at once both naive and attracting. M. Voisin has the misfortune of stammering himself, although he be a physician, and has written a pamphlet on the subject, so he wisely alleviates his misfortune in that spirit which is so characteristic of his countrymen, and turns his mishap into a source of innocent and even laudable self-gratulation."

It is noteworthy that at the age of twenty-eight years MacCormac was quite confident of his knowledge of the workings of the feminine mind and tongue; I wonder whether he was still so confident when he was eighty-two. In spite of the condescending air of this excerpt from his writings, he was to become a pioneer in the higher education of women, as when he wrote: "In all desirable lofty respects the education of women should be the counterpart of men, the freest scope in literature, science, and art, with everything relating to household and personal requirements."

Other short volumes were entitled "Aspirations from the Inner, the Spiritual Life" and "A Conversation of a Soul with God, A Theodicy"; there was also a three-volume treatise entitled "Life." He translated the Meditations of Marcus Aurelius Antoninus and Manual of Epictetus. On a more mundane level he wrote "A proposal for the painless extinction of life in animals designed for human food," but seventy years were to elapse before Lt.-Col. T. G. Moore brought his bill before Parliament to introduce into England the mechanical killer which had already been adopted in Scotland and Northern Ireland.

The review of his shorter essays and letters to newspapers is even more fascinating and some are also curiously apposite to our own era. For example, his "Three Short Letters on Juridical Manslaughter," which he called Human Vivisection. His views on hanging may be summed up in four simple sentences: "The murderer, we are told, is not fit to live. Is he then fit to die? Indeed if it comes to that, who among us is entirely fit to live or entirely fit to die? We all, more or less, have need of the mercies of God."

Never afraid of emphasis, he is nowhere more emphatic than in "Moral Secular Education for the Irish People versus Ultramontanist Instilment," a tract of forty-four pages of terrific indictment of the Roman Catholic Church, and, in particular,

its educational methods. In an open letter to H.R.H. the Duke of Cambridge on the Health of the Soldier, we read sentiments worthy of Field-Marshal Montgomery, as when he claims that "the soldier's barrack in every material health-promoting respect ought to be as well-appointed as the officer's bungalow," and when he advocates the encouragement of early marriage and the provision of good married quarters.

Reminiscent, too, of recurrent correspondence in agricultural journals on the importance of natural manures, is his address to the Chemico-Agricultural Society in June, 1872, "On the Loss of Ammoniacal Ingredients and Phosphates of Transition."

In the Dublin Journal of Medical Science for 1871 there appeared "some remarks on structure and function in advocacy of the spiritual origin and direction of life," in which he ranged over wide fields of zoology, philosophy, ethnography, and religion—with a distinct bias against the teaching of Mr. Darwin. He wrote many letters to the Press and even presented a personal petition to Parliament, urging for the drainage of Lough Neagh in order to reclaim many acres of fertile land. Another example of his progressive mind is shown in a letter written to the Press in 1883, when he was a very old man, in which he urged that employers should set up dining rooms to serve good food at cost price. As an additional inducement, he adds, "I am not pope, but promise them heaven when they do." In the same letter he urged that schools for cookery should be established. (How delighted he would be to know that two British universities give the degree of B.Sc. in domestic science.) His views on dietetic requirements would stagger Mr. Strachey, for he stated that an adult requires 1 lb. of meat and 1 lb. of bread, or its equivalent, daily. Loving exercise himself, he suggested that tricycles should take the place of milk carts, thus combining healthy exercise with necessary commerce.

In his paper to the Belfast Architectural Association he aired his views on the structure of houses which were to be designed by architects rather than builders, and were to be so variegated as to avoid monotony and beautified with climbing blossoms. Perhaps the most ingenious part of this paper describes windows, each in three parts, the lowest made to open "like a door," and the highest being made capable of being tilted inwards to deflect the incoming air upwards, and thus avoid draughts on the heads of the occupants of the room.

He must have found the days too short for his full and active life. Sir William MacCormac has left it on record that his father got up at four o'clock in the mornings, even in winter, and worked for four or five hours before breakfast, so that we may say of Henry MacCormac that he not only opened his window, but he looked through it: hence the title of my paper. What changes he saw through that window in his eighty-six years. As a schoolboy, he had seen the flags fluttering for the news of Waterloo and the downfall of the tyrant Napoleon; as a young man, he had seen the cheering crowds acclaim the accession of the young Queen, and the birth of the Victorian era of splendour and advancement. He had bought papers, bringing grim but glorious news from the Crimea; had read of his gracious Sovereign's assumption of the diadem of the Indian Empire, to the great

benefit of the Indian peoples; had seen the rise of the American Republic, freed from civil strife, and, of less happy augury, the birth of Imperial Germany, and the strangling of France by her iron hands. Nearer home he had watched the tremendous developments of British medicine, and, in particular, he had seen the little medical school, where once he had been a young professor, going on from strength to strength and achieving a world-wide reputation. In 1849 there had been 28 medical students; in 1886 there were 244. He had watched the rapid growth of Belfast from a small town with a population of 53,000, to one of 232,000 inhabitants, just about to receive the Royal warrant which established her as one of the great cities of the United Kingdom. Perhaps best of all, he had seen his son, William, throughout the greater part of his magnificent career; in which he discarded the white coat of a house surgeon in the Royal Hospital, Belfast, and the blood-stained apron of a doctor in war-time, for the Presidential gown of the Royal College of Surgeons of England. Fifteen years after his death, Sir William MacCormac wrote a filial tribute in which he said that his father's "most earnest conviction was that the human race would develop goodness and greatness . . . to him, mankind was one brotherhood, capable of ultimate perfectability, and of reaching, by effort and endurance, the desired goal. He was profoundly a religious man, with an absolute belief in the goodness, greatness, and divine perfection of the unseen God . . . I never knew any of more gentle disposition . . . a man of great mind and of great heart; great in human sympathy and affection."

In a recent letter to me, Dr. Henry MacCormac, his grandson, wrote: "I only very dimly remember my grandfather as a kindly old gentleman, very fond of children, for whom he kept pocketfuls of sweets, which he distributed liberally. His benevolence extended to the embarrassment of others at times, as, on one occasion, when he invited a German band into his house for breakfast, and at other times when the oddest people, who seemed hungry, became his guests."

And that is the picture which I should like to leave in your minds of Henry MacCormac, who was, perhaps, eccentric, but whom I commend to you as one of the most notable and noble figures of his time.

LIST OF PUBLICATIONS BY DR. HENRY MACCORMAC

- "On the Nature, Treatment, and Prevention of Stammering or Hesitancy of Speech" (1828).
- "An Exposition of the Nature, Treatment, and Prevention of Continued or Typhus Fever" (1835).
- "Philosophy of Human Nature in its Physical, Intellectual, and Moral Relations" (1837).
- "Methodus Medendi, or a Description and Treatment of the Principal Diseases Incident to the Human Frame" (1842).
- "On the Nature, Treatment, and Prevention of Pulmonary Consumption, and, incidentally, of Scrofula" (1855).
- "Consumption, as Engendered by Re-breathed Air, and Consequent Arrest of the Unconsumed Carbonaceous Waste: Its Prevention and Possible Cure" (1865).
- "On the Nature, Treatment, and Prevention of Asiatic Cholera."
- "Directions for the Treatment of Asiatic Cholera in the Unavoidable Absence of Medical Advice."
- "Meditations of Marcus Aurelius Antoninus, with the Manual of Epictetus" (from the original Greek).
- "Aspirations from the Inner, the Spiritual Life."

- "Moral and Sanitary Economy."
 "Metanoia: A Plea for the Insane."
 "A Proposal for the Painless Extinction of Life in Animals Designed for Human Food."
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3. UNDERWOOD, E. ASHWORTH, M.D.: *Proc. Roy. Soc. Med.*, XLI, 3, 165; 1948.
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REVIEWS

THE MODERN MANAGEMENT OF GASTRIC AND DUODENAL ULCER.

Edited by F. Croxon Deller, M.D., M.R.C.P. Pp. 227. Edinburgh: E. & S. Livingstone Ltd. 20s.

THIS monograph on gastric and duodenal ulcer is a kindly publication on a subject of great importance; not only on account of the large number of persons who suffer from them, but also because of the chronicity of the conditions and length of time required to treat them effectively. The book is a composite work by physicians, surgeons, a radiologist, and anæsthetist. This approach throughout is essentially practical. After a short survey of the anatomy, physiology, and pathology, separate chapters are devoted to symptoms, clinical examination, special investigations, diagnosis, decision on treatment, strict medical therapy, indications for surgical treatment, with details on technique and anæsthesia.

The chapter headings give a good idea of the plan of the work. The book is interesting and readable, and can be warmly recommended as a good summary of present-day knowledge and as being helpful in the management of cases of gastric and duodenal ulcer. J. S. L.

TEXTBOOK OF SURGICAL TREATMENT. Edited by C. F. W. Illingworth.

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WIDDOWSON, T. W. : Special or Dental Anatomy and Physiology (7th edition, 1946).

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JENKINS, W. D. : Dermatoses Among Gas and Tar Workers (1948).

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DAVIDSON, L. S. P., AND ANDERSON, I. A. : A Textbook of Dietetics (2nd edition, 1947).

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KOLMER, J. A. : Penicillin Therapy (2nd edition, 1947).

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REVIEWS

AIDS TO EMBRYOLOGY. By J. S. Baxter, M.Sc., M.D., F.R.C.S.I. Fourth Edition. Pp. viii + 181. 45 illustrations. London : Baillière, Tindall & Cox. 1948. 5s.

It is twenty years since this book first appeared, and ten since the third edition, under the editorship of R. H. Hunter, its original author. An attempt has been made in the present edition to incorporate the many advances in our knowledge of human embryology which have been made during the past decade, and the text has been practically completely rewritten. The original lay-out and most of the illustrations, either in their original or in modified form, have been retained, and some new illustrations have been added. The new author has succeeded remarkably well in his attempt, and he has kept the book, which gives an account of the main developmental changes which occur during gestation, a very readable one. It is strange, however, to find no direct mention of organisers, or of inductive phenomena in general. Nor is there mention of the theoretical importance of such concepts which suggest reasons for the occurrence in the ontogeny of a human embryo of the transient embryonic structures, such as the primitive streak, notochord, pro- and meso-nephroi, pharyngeal clefts, etc. Attention is called to the functional activity of the mesonephros in lower mammals until such time as the metanephros is able to function. It might have been added that the degree of activity of the mammalian mesonephros is in some measure related to the types of placentation found in the species concerned. There is occasional unevenness of stressing which could easily mislead the student. The paragraph on the myelination of the tracts in the C.N.S. may be used as an illustration. The paediatrician and the child psychologist, as well as the student, is interested in the times of myelination of the main nerve tracts in the brain and spinal cord, if indeed this process accompanies the acquisition of function. What exactly is meant by "aberrant pyramidal fibres," and why are they singled out along with the obscure olivo-spinal tract, whose exact origin and termination are unknown, for especial mention, when such important tracts as the main cortico-spinal and the spino-cerebellar tracts are omitted? The chapter on the coelomic cavities might also be mentioned as an example. It is much too short,

even for a book of this nature, although this is partially compensated by the sections on the individual viscera.

The index has been shortened, but seemingly not to any consistent plan. Further systematisation of the index would render it more useful and still keep it within the limits set by the prevailing paper shortage. The eye, for example, could have been treated as the other organs are, and had all its abnormalities listed under an inclusive title. Congenital cystic eye appears in the index, but has been omitted from the text. The cranial nerves could well have been treated collectively, and that important peripheral nerve, the phrenic, included in the space thus provided. The addition of a very short bibliography, giving the sources of the works quoted in the text, would have been of great value to the senior student, and should not occupy much space. It is only irritating to be told that *Flexner and Gellhorn (1942), using radioactive sodium and heavy water, have shown that, in the guinea-pig at least, there is constant exchange of these substances between the maternal circulation and the amniotic fluid, and then to be unable to look up the relevant paper for want of the exact reference. In the main, however, the book fulfils its primary object, and should prove its worth as an *aide memoire* to the student preparing for the Second Professional Examination in Medicine.

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EMERGENCIES IN MEDICAL PRACTICE. By C. A. Birch, M.D., F.R.C.P. Pp. 468. Edinburgh: E. & S. Livingstone. 1948. 25s.

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This is a popular book, probably because of its clear, direct teaching, backed with the authority of the Edinburgh Medical School, and its shortness. The latest edition has kept these features. Brief mention of aviation trauma to the nasal sinuses and the middle-ear, a few lines on the

finestration operation and its effects on otosclerosis, and the inclusion of penicillin in the chapter on chemotherapy, have brought the text up to date. It gives the busy practitioner a compact source of guidance in the diseases of the specialty and provides the student with the theoretical background for his work in the ear, nose, and throat department. H. A.

MANUAL OF PUBLIC HEALTH: HYGIENE. By J. R. Currie, M.A.(Oxon.), M.D., LL.D.(Glas.), D.P.H.(Birm.), F.R.C.P.(Edin.), and A. G. Mearns, M.D., B.Sc.(Public Health), D.P.H.(Glas.), F.R.S.(Edin.). Third Edition. Edinburgh. E. & S. Livingstone Ltd.

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Wilson during a war-time nutritional survey in Oxfordshire, and by the well-known problem of the association of hard waters, as well as iodine deficiency, in the causation of endemic goitre. More recently, a question has been raised as to the relationship of high fluorine content in hard waters as being a significant factor.

The first part of the report is a note on the clinical assessment of thyroid enlargement by Professor J. A. Ryle.

This most balanced statement is of great value, and the care devoted to this preliminary work must be noted by all surveyors in the future. The classification adopted uses the two criteria of size and consistency of the gland (the latter including symmetry). There result four categories:—

Group (a) Invisible at rest.

Group (b) Visible to the trained observer, but soft, smooth, and symmetrical.

Group (c) Conspicuously enlarged (visible +), but showing no palpable asymmetry, firmness, or nodular change. This type is sometimes referred to as the "Rossetti" neck.

Group (d) Showing a degree of firmness, asymmetry, or nodular change, which can be regarded as definitely pathological.

The second part of the report reviews critically the literature on the subject and sets out the scope and findings of the present investigation.

In all, about four thousand children between the ages of eleven and seventeen were examined by members of the team in Berkshire, Devonshire, Dorset, Essex, Hertfordshire, Oxfordshire, and in Scotland in the counties of Dumfries and Inverness.

In all these areas a complete mineral analysis of the water supplies was undertaken.

More local surveys were also made of the incidence of goitre in women, and a village survey in a known goitrous area containing 575 persons of all ages. This was principally designed to show the distribution of 'physiological enlargement of the thyroid and true goitre.'

The conclusions from their findings are really rather difficult to discover in this report. It is one of the less clear of the M.R.C. memoranda.

They confirmed the general inverse relationship between iodine content of water supplies and incidence of goitre. They also confirmed that when the water is hard a high goitre incidence may be found, even when the iodine content of the water is much higher than is associated with a high goitre incidence in a soft-water area.

They could not find a specific association of goitre with a high fluorine water content. They point out, however, that this country is not suitable for such an investigation, because very few waters have a very high fluorine content.

They recommend the addition of one part of potassium iodide to one hundred thousand parts of all salt, or one part to forty thousand of table salt in this country.

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MANUAL OF LEPROSY. By Ernest Muir. Edinburgh : E. & S. Livingstone Ltd.

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In whatever part of the world leprosy is encountered, the name of Muir is known and respected as that of a worker with deep knowledge of the disease in all its aspects. Some of the fruits of his extensive experience are presented in this small book, which, as the preface states, is intended for the use of "Doctors, nurses, and lay workers who are especially engaged in anti-leprosy work."

The first two sections dealing with the nature of leprosy, its diagnosis and treatment, are a good summary of our knowledge of the disease and should prove useful to medical men in general practice, especially those engaged in practice in regions where the disease is endemic. The third section deals with methods of control and is a short account of modern thought and practice. The writer agrees with the author that the success of a leprosarium is not in direct ratio to the money spent on it. As in every other aspect of human endeavour, the human element is more important than the material.

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