

The Changing
Concepts of
Paediatric Care

*An Inaugural Lecture
Given in the University of
Rhodesia*

Professor
J. Wolfsdorf

UNIVERSITY OF RHODESIA

THE CHANGING CONCEPTS OF PAEDIATRIC CARE

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*An Inaugural Lecture
given in the
University of Rhodesia
on the 20th July, 1972*

by

Professor J. WOLFSDORF
*Head of the Department of Paediatrics
and Child Health*

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THE CHANGING CONCEPTS OF PAEDIATRIC CARE

"It is impossible to understand the present without knowing the past."

Goethe.

"The farther you look back, the farther forward you can see."

Sir Winston Churchill.

IT is perhaps usual, certainly customary, polite and politic, when one intends looking over one's shoulder into early medical history, to single out individuals who, by their practice of the art or science of medicine, have made contributions to that subject which, when taken over the years of history, have added to the cumulative knowledge of what is known today. On going through the literature of the history of pediatrics, what strikes one is the similarity of approach of most authors in dealing with the subject. Great names are named, their publications cited, their contributions lauded, and their place established in history. However, at the end of the bibliographies of the early physicians, one is left with an emptiness, a certain lack of fulfillment; and if one dissects out the reason for this, it immediately becomes apparent. After reading the stories of the lives of medical men over a period of almost 2 000 years, one comes away without knowing what the impact of most of the men and their discoveries was, on the *people* and their lives. For it is, after all, improvement in the health of *people* in general for which we work and strive, and thus all our medical successes should be measured, in the fullness of historical time, against the impact they have made on the health and welfare of the people as a whole. Medical

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history, and paediatric medical history is no exception, confines itself to dissertations of men on diseases and disease processes. While it is true that this accumulated knowledge has aided and improved the health of children, it is also true that the major improvements in infant mortality and child health, including those of the last century, were perhaps almost unrelated to the endeavours of those who wrote on, taught on, and practised on, children. On the contrary, in fact.

But let me start at the beginning.

Though paediatric practice as we know it today is the product of merely a few decades, one can divide the history of the interest of physicians in children's diseases into several phases, beginning prior to the Graeco-Roman period (starting in the 5th century B.C.) and then proceeding through to modern times.

In the primitive stages of human civilization, the child was regarded as a negligible factor, being the weakest of human protoplasm. Infanticide, abortion, cannibalism, and ritual sacrifice of children were the rule, solicitude for their preservation, the exception. Children were mutilated by tattooing, disfigured by artificial binding, and had ritual operations performed on their genitalia. Twins were frequently killed as unnatural phenomena, or upon the supposition that one of them was a superfetation from adulterous intercourse. The Arabs, then a nomadic desert people, sacrificed their infant, and even adult, daughters by burying them alive. Specific diagnosis and therapeutics were non-existent, and charms and wonder tales made up a significant aspect of treatment.

In 460 B.C. a child was born on the Greek island of Cos, who was destined to become the first man to treat medicine as a practical study, rather than as a primitive art, or a speculative philosophy. His name was Hippocrates, and though he wrote no special treatise on paediatrics, he repeatedly pointed out the special features of diseases when they occurred in children.

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Aristotle, in 384 B.C., though not a medical man, had a true scientific mind and was probably the first man to study the physiology, as it was then, of the normal infant. His writings and references to children were quoted by writers on paediatrics until as late as the 17th century. Four hundred and fifty years were to pass before any other physician arose whose writings were to survive.

Celsus, practicing when the star of Rome had reached its full glory, and was perhaps already declining, published, probably in the very early part of the first century, his *De Medicina*. To us he is of special interest, because he is the first author to state in so many words that "children require to be treated entirely differently from adults". Though he describes many kinds of diseases in the suckling baby, the treatment he advocates is in general directed not at the baby, but at its nurse. For mouth ulcers he advocates — "The nurse must be made to take exercise, both in walking and in such labours as affect the upper parts. She should be sent to the bath and ordered to bathe her breasts in hot water, and feed on light foods and such as do not easily become undigested; and if the child is feverish, the nurse should drink water, and if her bowels is constipated, it must be opened". The idea of treating the child by treating the nurse remained established practice until the 16th century.

Nearly a century after Celsus, Soranus (A.D. 98-117) wrote the first treatise dealing specifically with children as part of his book "On Diseases of Women". It was not merely an incidental, but dealt with children's diseases as fully as the knowledge of the time allowed. However, it established a precedent which was to last down to our own day, of the association of midwifery with diseases of children, an association which was to hamper and obstruct progress in the study of diseases of children almost until the end of the last century. Soranus was the first medical writer to mention the salting of the infant after birth, though the practice of such cleaning of the baby at birth dated at least as far back as Ezekiel in about 600 B.C. He also described

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the method of testing the consistency of breast milk by the behaviour of a drop of milk placed on the finger-nail. This test was used for over 1 600 years, and was propounded in the literature as late as 1752.

Claudius Galen (A.D. 130 - A.D. 200), 20-30 years after the death of Soranus, also made mention of children, incidentally, but has the distinction of first emphasising the usefulness of the "dummy" and "moderate movement" and "singing" to keep a child quiet. It is also of interest to note that he states "The normal child is good in every way, he requires no correction of maners; *what is rather needed is prevention of corrupting*". Even then it was recognised that there were no bad children, only, possibly, bad parents!

From Galen until the advent of Rhazes and the Arabian school of medicine, in A.D. 900, no real changes occurred in the development of paediatric care. Prolapsed rectum, hiccoughs, sneezing, snoring and teething were noted, and the smearing of hares' brains onto teething gums was advocated as a soothing manoeuvre, a bizarre practice which continued to be mentioned by most writers on diseases of children until the 17th century; that is for about 1 400 years! The enquiring mind of man appears never to have intruded on his ever productive writing hand during that period.

Avicenna, the most famous Arabian physician, was the first to mention antenatal care, and his many books covered the whole field of infant care and infants' diseases. Though his account of each disease hardly amounts to more than a statement of their occurrence, he does mention the use of wine as a soporific or anaesthetic, and I quote — "so that pain which has to be inflicted in the treatment of some part of the body may not be felt".

From the time of the Arabian physicians, through mediaeval times, until the Renaissance, there are no writers on paediatrics who have left a name behind. The tendency of internal medicine was purely scholastic, and whatever small contributions were made to the welfare of children,

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came not in medical care, but from the Church, in terms of asylums or homes for the multitude of abandoned infants, who were characteristic of that age.

The revival of learning in Europe really began with the printing of the Gutenberg Bible at Mainz in 1454, one year after the fall of the Eastern Roman Empire. After that, Greek scholars poured into Europe and in May, 1471, the first medical book was printed, followed by many on paediatrics, often now in the vernacular, but still clinging mostly to the ideas of Avicenna and Rhazes. It took however another 100 years before the first book on paediatrics was published in English. This, in 1545, was written by one Thomas Phaïre; and in fact up until 1650, only one other author wrote, in English, on paediatrics. In the late 15th and 16th centuries all modes of artificial feeding of infants were in vogue. Ulceration of gums was treated with "hens grease" or "conies brain", diets were frequently blamed for most ills, and the physicians treating children were not averse to using charms like "mystletow of the oke taken in the month of March and the moone decreasyng" or hanging stones, from young swallows' bellies, around sick children's necks. Though Phaïre, the Englishman, added little or nothing to the knowledge of disease in children, he wrote at least for the general public in a simple and practical way and, for the first time, in their own language, and for this he has gone down in the annals of paediatrics. Though by the end of the 16th century no clinical observation was allowed to alter what had been written by Hypocrates or Galen, the application of the minds of men to reading and learning, had prepared the way for some advance to occur in the 17th century.

This century was an age of great poets, great dramatists, great philosophers, great painters, great musicians, great scientists, and great mathematicians. Magnetism was described, Harvey demonstrated the circulation of blood, microscopy, histology, physiology, thermometry, injections, transfusions, and the obstetrical forceps were introduced.

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It was an age otherwise notable for its cruelty to children. Infants were thrown into sewers, abandoned, and left to die in the streets. In restoration England 50% of all children died, two-fifths of them under the age of two years. The ancient custom of salting and swaddling infants continued. Mercenary wet-nursing was the rule, and broth was the earliest artificial food given. In spite of this *general* lack of interest, hundreds of monographs on *special* subjects in paediatrics appeared. Sydenham, the greatest physician of his time, lived and died. The relationship between typhus and the louse was recognised, scarlet fever was carefully described and given a name, cretinism, beri-beri, pneumonia, dysentery, hysteria, chorea minor, measles, rickets and scurvy too, were clearly described. Harris' treatise on paediatrics became renowned far beyond its worth, and as the belief that all pathology was a tangle of hot and cold, moist and dry, had fallen into disrepute, he propounded that all diseases in children were due to one underlying problem, "acid". Children were thus doctored with crabs' eyes, chalk, mother of pearl, and sundry assorted powders — to their detriment.

Thus, until the 18th century, both in terms of prevention and treatment of their diseases, children were totally unprotected, and the concepts of preventive medicine, normal growth and development, and specific therapeutics undiscovered.

The introduction of a method, described by Jenner in 1798, after 23 years of thoughtful observation and experiment, and soon utilized by the whole of western Europe, probably produced the greatest benefit to mankind that any measure to date had achieved. It was, of course, smallpox inoculation. The story of Jenner's discovery has been told so often that it is unnecessary to repeat it fully here; the chance remark of a dairy maid that she had no fear of smallpox as she had caught the pox from the cow; the patient collecting of observations proving the truth of the accidentally-conferred immunity, followed by the testing

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of his hypothesis, and finally the vindication of all his hopes, was the first step taken towards preventive and hygienic measures which, with the social revolution that was taking place, were to make major impacts on childhood mortality rates in the years ahead.

In spite of George Armstrong's opening of the government dispensary for the poor in 1769, and his plea that doctors should prescribe for and be competent to treat ailments in children; in spite of outstanding publications by Robert Wyt of Edinburgh in 1772 on tuberculous infants, Michael Underwood's work on poliomyelitis and his early essay on infant psychology, and Rosen von Rosenstein's treatise on paediatrics, and despite the pleas of Frank, the pioneer of school hygiene, and Andrew Wilson who first advocated that paediatrics should be taught, the conditions under which children were brought up were appalling.

The evils of baby farming and mercenary wet-nursing, were rife. The English wet-nurse got 25 guineas a year, which led to many women having illegitimate children who were then abandoned. In Georgian England mixed feeding after birth, of moistened bread, wheat-broth, beef tea, French bread, and even minced meat of turtle doves, larks, thrushes and chickens was preferred to cow's or goat's milk. Much of the food was enriched with spices, wine or beer. Infant mortality was appallingly high. Of 10 272 infants admitted to the Dublin Foundling Hospital between 1775 and 1792, only 45 survived, a mortality rate of 96.6%. From tables completed from the London Bills of Mortality covering the 100 years ending 1829, the death rate per 100 children under five years of age was approximately 70%.

Interest in infant mortality, the important realization that children, and particularly infants, were not merely small adults, that they differed profoundly from adults in terms of physiology, biochemistry, pathology, and bacteriology, and the move of some physicians to devote their whole time to the study of diseases of children, allowed for the first real changes in the care and understanding of the

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factors involved in infant mortality to take place. To render a detailed account of the vast paediatric literature of the 19th century is obviously outside the scope of this paper. However, three outstanding trends in the philosophy of paediatric care can be discerned. These were:—

- (i) The infant welfare movement.
- (ii) Paediatric diagnosis, therapeutics, and research.
- (iii) The building of hospitals specifically for paediatric patients.

The infant welfare movement had its origins in France where, because of the extraordinarily high infant mortality rates, there was danger of national and racial destruction, and, at the same time, because there were fine humanitarian French writers who had laid bare the evils of baby farming and other obnoxious practices. Though it was true that the introduction of vaccination had brought about some temporary lowering of infant mortality in the Napoleonic period, these results were soon nullified by changes in the social order of the time. The French and American Revolutions had brought about social democracy and industrialism in England. Vast improvement in the mechanical arts and machinery occurred with rapid movement of the rural population to the big cities. The need for cheap labour brought thousands of women into workshops, which caused mothers to neglect their children, and exposed the mothers, and consequently their offspring, to the hazards of various social diseases. Child labour was common. The vigorous humanitarian agitation against child labour and the inhuman sufferings to which these unfortunate were exposed, was led, not by physicians, but by men like Lord Shaftesbury, the great Victorian reformer. The revealing of the abuses and sufferings to which children were subjected, the

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apprenticeships which were close to being sold into slavery, the floggings, fetterings, torturing and starvation, led Sir Robert Peel finally to pass, in 1802, his "Factory and Morals Act" for the preservation of the health and morals of employees. This Act had little effect. However, 70 hard years later, the "Life Protection Act" was passed. This required the registration, licensing and inspection of all places where infants were farmed out away from their parents. Davis founded the only English public dispensary for children in his day, and had remarkable pre-vision of modern social services in his idea of visitations by benevolent ladies among the poor for the purpose of looking after sick children and instructing ignorant mothers of caring properly for their infants.

It was from Europe that the most impressive lessons came in the science of attacking the problem of infant mortality at its source. In 1887 the Swiss passed a law requiring a rest of two weeks before, and six weeks after, the birth of a child, the prenatal period being lengthened by a further law in 1877. Pierre Boudin organised the first baby welfare clinic in Paris in 1892. For the first time, infants were regularly weighed and examined, and mothers instructed in infant nutrition and hygiene. In a small village on the Cote d'Or, *the mayor*, a Monsieur Morel de Villiers, was interested in problems of hygiene, and applied certain principles to the welfare of the babies in his district. These included the insurance of every pregnant woman, married or unmarried, at the expense of the mayoralty, by the declaration of pregnancy before the seventh month; free medical aid for all cases adjudged dangerous by a midwife; a grant of \$0.20 per day to every woman remaining in bed for six days after her confinement; compulsory sterilization of milk; weighing of newborn babies every two weeks; the compulsory notification of illness in an infant within 24 hours of its appearance; and the withdrawal of license to practice from nurses who did not comply with these regulations. Being a wise man, he also offered \$0.50 to any

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nursing woman who could produce a one-year-old child in good health as a result of her nursing care. These conditions, which contain all the essentials of good infant welfare, produced the outstanding result of a stable and very low mortality rate. His activities did not go unnoticed by others. Mr. Benjamin Broadbent, Mayor of Huddersfield, England, and his Medical Officer of Health, obtained final approval for "voluntary notification of birth to the Medical Officer of Health" and the visiting of infants at home by women doctors and voluntary workers to instruct the mother in the care of the child. An English law of 1837 required registration of birth at any time within 42 days. In 1906 the Borough of Huddersfield obtained powers requiring the notification of birth to the Medical Officer of Health within 48 hours. In 1907 Parliament passed the Notification of Births Act requiring notification and registration by the father (or other responsible person) to the medical officer of health within 36 hours after birth, or payment of a fine of 20 shillings. In 1915 this Act was supplemented and extended to all areas and vested the local authority with the power of a sanitary authority for the promoting the care of expectant mothers, nursing mothers and young children. In the first year of the full promotion of the infant welfare movement, infant mortality was reduced by 30%. In 1910, Sir Arthur Newsholme showed that the causes of infant mortality at that time were mainly maternal ignorance and indifference, poverty, overcrowding, intemperance, defective sanitation, industrial employment of women, large families, and infectious diarrhoea. Infant mortality, he stated, "is the most sensitive index we possess of social welfare and of sanitary administration, especially under urban sanitary conditions".

The present infant welfare movement implies the widest extension of the activities of social medicine, from ante-natal supervision (including pregnancy clinics, insurance for mothers, maternity homes, schools for mothers and family planning clinics) to post natal supervision (including milk stations, day nurseries, play centres, nursery school; school

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inspectors, school clinics, child study, including physical, psychological and mental testing, child labour legislation, child welfare activities, vocational aptitude studies, instruction in home economics and training for parenthood).

Attention to social improvements had made far greater inroads into the infant mortality rate than any major scientific discovery had done to that date.

Not that the scientific discoveries of the 19th and early 20th centuries were insignificant. On the contrary, they were far-reaching in importance and did and do play a significant role in improving the health of all children, both in the past and at present. However, it was simply that at that time the priorities were social, rather than medical. countrywide, rather than individual-oriented. No-one will, I am sure, underestimate the benefits that accrued from the work and writings of such great men as Henoeh in Berlin, who initiated the *modern* concept of paediatrics, and described purpura; Esherich, who discovered the bacteria that frequently gives rise to infantile diarrhoea; Schick, of diphtheria fame; Von Pirquet, the man who elucidated the concept of allergy; Semelweiss and Lister, who established the importance of sterility and aseptic techniques in the control of infection; Grancher and Hutinel, who introduced the isolation cubicle concept for infectious patients; Still, for his description of juvenile rheumatoid arthritis; Trousseau, who introduced tracheotomies for diphtheria; Koplick, who discovered the spots diagnostic of early measles and established the first milk depot in America; Abraham Jacobi, the founder of American paediatrics; and the "clean milk" advocates, Rotch, Schlossman, Howland, Emmet Holt senr., and many, many others. Most of these important first paediatricians worked in and from University Departments of Paediatrics and Children's hospitals in Austria, Germany, France, and the United States.

The 20th century elevated paediatrics from its ancillary status as a dependent dwarf of ordinary medical practice to the larger atmosphere of socially oriented medicine, and

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though the science of infant diseases is a plant of recent growth, the generic idea of its importance has existed from time immemorial, only waiting the opportunity to burst forth and find expression.

Only in Britain had there been a delay in the setting up of departments of paediatrics in the universities, and in the development of paediatrics as a full-time career. This had been due largely to the organisation of hospital work there, and also economic factors in the early part of the century. However, by 1881, Henry Ashby had become the first physician in Britain to devote himself entirely to diseases of children, and was appointed Lecturer in Diseases of Children in Manchester in that year. George F. Still was appointed to the staff of the Paediatric Hospital in Great Ormond Street in 1897 and became the first British professor of paediatrics, at King's College in 1906. In 1889, John Tompson became the first paediatrician at the Royal Hospital for Sick Children in Edinburgh. Later, in 1924, Glasgow University appointed Leonard Findlay as their professor of paediatrics, followed by Professor Vining in Leeds in 1927 and Leonard Parsons in Birmingham in 1929. Still in London and Tompson in Edinburgh undoubtedly did most to influence general medical opinion in favour of the specialty, but Findlay in Glasgow was outstanding for his successful use of laboratory methods, and Parsons in Birmingham made that centre the leading English paediatric research centre of the thirties.

Long before the birth of the first whole-time practising paediatrician, however, children's asylums had been established. But these were only places of refuge, not true dispensing hospitals. Children's hospitals in England and America date only from the middle of the 19th century. Charles West initially started the trend in London. In spite of much opposition and many rebuffs he, with the help of the social prestige given him by his colleague Bence Jones, and much data accumulated from many continental children's hospitals, gradually secured a hospital for

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children in London. Thus the Hospital for Sick Children in Great Ormond Street was opened in February, 1852. The hospital accommodated 75 patients and had 52 convalescent beds, a ratio which perhaps escaped interpretation at that time, but which is of extraordinary interest in the context of present-day paediatric thinking. Between 1852 and 1910, a further 18 children's hospitals appeared in London alone, and paediatrics as a specialty began to come into its own.

In the years between the two world wars, rapid development of preventive services occurred in Britain, and once again a significant impact was made on infant mortality, which continued to decrease. The advent of sulphonamides in 1935, and the accidental discovery by Fleming of the mould which led to the purification of penicillin in 1940 by Chain and Florey, caused the mortality from bacterial infections to decrease markedly. However, in comparison to the decrease in mortality which improved social standards of living and preventive medicine had wrought, the decrease, surprisingly, was insignificant.

We are now in a position to look at paediatrics at the present time. What follows is a description of what is present in most countries of the world, to a greater or lesser extent, independent of whether they are termed developed or under-developed from a socio-economic point of view. The only differences to be found will be temporal, in degree, or modified by local conditions.

Paediatric medical services have appeared haphazardly, and in an un-co-ordinated fashion. A strict dicotomy has and still exists between preventive and therapeutic paediatrics, and even within each of these sections dicotomies exist, one of the most important ones being the artificial separation of the care of the newborn while in utero and his care immediately after birth. At present, local authorities are primarily involved in the organisation and running of preventive health services, while central governments run

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the therapeutic hospitals. Contact between them is often poor and dividing lines hard set.

Local authorities run many well-baby clinics, where the immunization of children takes place and the examination of well-babies and the treatment of minor ailments occur. Overwhelmingly, these services are required for the lower socio-economic groups. However, for rapid benefits to occur, as in Britain during the last century, massive support must go to improvement of nutrition, housing, sanitation and water supplies. Attention to these factors will herald the major improvement in infant mortality that we should all like to see, analysis showing that medicine plays a secondary role in the process. Perhaps it is worthwhile mentioning at this stage that the family over-population which is present in the lower socio-economic groups, is not peculiar to any country. It occurs, and occurred, in all countries where life is, or has been, of little importance, and where ignorance and poverty are abundant. As has been seen in Britain, once standards of housing improve infant mortality drops, and with this there occurs a greater awareness that it is the quality, rather than the quantity, of life that is important; the ground for family planning, rather than people, becomes much more fertile!

Now and in the future integrated preventive and therapeutic paediatrics, as well as environmental control, should be the first step, and come under a comprehensive health service, overall direction being given by a Minister of Health, but implementation of policy, the function of comprehensive health service regional boards. These should be authorized to ensure that not only primary medical care is given in the first instance until overall improvement in mother and child health has occurred, but also be involved in environmental control, sanitation, housing, maternity care, and well and sick baby clinics. Their concern must further be with the functioning of physicians, nurses, midwives, dentists, and all those paramedical personnel involved in giving total care to children, whether they be in

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hospitals or outside units. Later, the finer points of the diagnosis and management of behavioural disturbances, minimal brain dysfunction and learning difficulties, can be gone into. Who should be involved in the provision of such a service? Let me say at the outset that the lead in the directing of health care should come from those people who are actively involved in providing for, and worrying about, children. Paediatricians, and particularly academic paediatricians must take the lead in giving direction to the manner in which services are implemented. Provision of day-to-day care has, certainly for the past 100 years, tended to be the prerogative of the practising doctor. More important than anything else at present is the need to rethink this approach, and, as never before, are bold courage and initiative required. No country in the world can, or ever will be able in the foreseeable future, to produce sufficient doctors to cope with the needs of its population. The question is simple. Does it require a man who has trained for a minimum period of seven years, or, if a specialist, for as many as 12 years and longer, to treat 90 per cent. of the medical problems that are seen among the lower socio-economic groups and probably 40 per cent. of the diseases amongst the upper social groups? The answer is unequivocally "No". Lesser trained personnel are perfectly capable of providing more than adequate care for the vast majority of every day problems, as long as they have the authority to refer on those children whose condition warrants referral, and have training commensurate with their needs. The ability to use our medical and paramedical manpower correctly will be the deciding factor in the years to come between the provision of good and bad medical care to the population as a whole.

Hospital services, under the same comprehensive regional health service, must orient themselves away from the confines of the areas immediately contiguous to them, and become involved in regional needs. The aim of many small hospitals, all trying to provide an optimal service, is

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wasteful, both in terms of man-power and money. The regional approach must become paramount. Peripheral clinics run by paramedical staff must process the vast numbers of paediatric patients, and transfer the few patients who require simple hospital care to local hospitals staffed by physicians trained in general paediatric practice. One central paediatric hospital for each region is required. This hospital should be attached to an academic centre and should provide all the sophisticated, difficult and expensive modes of therapy that only a few of all patients seen will require. This so-called "ivory tower" however, should provide not only all types of sophisticated medical care, but, in addition, should be the leader of the regional team for the total care of all its children. Movement to and from the main centre is essential at all levels, and must include services to patients, teaching, and research.

Hospital in-patient care of children is at present decreasing and will become less a feature of future paediatric hospital care. The recognition that children and their mothers should not be separated, together with the fact that more and more can be done therapeutically on a short-term or outpatient basis, has evolved into what will be one of the dominant trends in paediatric care; ambulatory paediatrics. Since, for a significant number of conditions, it is no longer necessary to admit a child to hospital, even though his mother may reside with him while there. Twenty-four hour stay day-units will inevitably play a greater and greater role in the provision of care to the paediatric population. Not only can children be investigated and treated well whilst in such a unit, and without the psychological trauma of formal admission to the hospital ward, but in addition, the economics of such units, which would reduce by some 40 per cent the number of children admitted to hospital, also make them essential. Thus investigation and treatment of children, previously carried out over prolonged periods in hospital, can and must be performed in paediatric outpatient departments. These facilities should be separate

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from any adult out-patient service, so that children will not be exposed to comments by adults, who are often totally unaware of the acute sensitivity of ill children. Nor should they be exposed to the sick, the mentally ill, the injured and the maimed who present each day at a general out-patient department. The value of having paediatrically oriented and trained personnel dealing with children has become obvious to all of us who have seen what happens when personnel trained in the management of adults come into a "small baby" unit. Chaos follows while they are being re-oriented. For children are not small adults. The smaller the child the truer this becomes.

As the ultimate referral centre for the region, the central regional teaching unit must be able to deal with any and all investigations and therapeutic techniques. Though this type of unit tends to be expensive, there are certain areas in finance — and medicine is one of them — where cost-effectiveness ratios cannot always be applied. Morally and ethically, it is incumbent upon every region to provide each child in its area with the possibility of optimum investigation and care.

For the upper socio-economic group, preventive medicine as it has been practiced for the past 100 years will, in my opinion, disappear. With the major challenge met in the *continued* control of preventable diseases, maximum benefit has almost been derived from this approach. For this group, orientation back from emphasis on the environment to emphasis on the individual is essential. Serious co-operation and contribution from individual patients and families will be necessary if the future child is going to fulfill his full genetic potential. We see the evolution of the need for this approach with the recognition by Garrod in 1908 of inborn errors of metabolism, followed by the elucidation of the concept "one gene one enzyme", by Beadle, and the later publication of the first volume of "Physiology of the New-born" by Clement Smith in 1945. These, coincidental with an almost static neonatal mortality rate, which has scarcely changed over the past 20 years, has precipitated paediatric

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interest in what has become one of the most important areas in the care of the child — the newborn period, that is, the time between birth and the end of the first month of life. The realization that not only poor maternal nutrition, but also factors such as maternal stress, smoking, drug taking, and acute infections, are hazardous to the unborn infant, has required further education *and co-operation* of the mother during pregnancy.

Nor must the parents' *joint* role be forgotten. Children brought up in homes where there is good quality of conversation between parents and child, love, religion, acceptance, tolerance, encouragement, praise when due, sensible discipline, and who are allowed to participate actively in the family life, who are stimulated by auditory, visual and tactile stimuli, and are encouraged to think and question—these children enjoy good mental health, are more stable, have better intelligence quotients, and may grow up to contribute to a society far better than our present one.

The ability to identify antenatally genetic and chromosomal aberrations has exposed parents, obstetricians and paediatricians jointly to the problems inherent in making decisions concerning continuation or termination of pregnancies. Population genetics and control, the answers to which can come only from responsible parental action, based on education, are moral questions which, in the long term, will affect significantly the health of the future children of this world.

Not only is the individual parent and family now involved in molecular biology, but also involved with the paediatrician at all levels are the nursery and primary school teachers who, in the long run, will be actively engaged in developing the full potential of the children in their care. The early diagnosis of behavioural disorders, perception defects and minimal brain dysfunction, is an important aspect of total child care today. More than ever now must paediatricians identify, and teach others to identify, and deal with, those handicaps which may, during the first five years

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of life, leave an indelible print on the child's ability subsequently to perform adequately.

Mr. Principal, Chancellor, honoured guests, ladies and gentlemen, I have attempted to take you through yesteryear, via today, to tomorrow and beyond. The scope for paediatrics is as infinite as the variations in the children with whom paediatricians deal. Care — from conception to adulthood — the responsibility is awesome. However, if we remember that our only aim, in the words of our early mentor Thomas Phaire, is "To do *them* good that have most need", we may, with humility, proceed to greater things. Thank you.

"Only the sham knows everything; the trained man understands how little the mind of any individual may grasp, and how many must co-operate in order to explain the very simplest things."

Hans Gross.

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