Middle Articles

Paediatrics — Past and Present*

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It is just 40 years since I was appointed a junior physician to the children's hospital at which I learned by experience the physical ailments of infants and children. Since then paediatrics has been my main (almost sole) professional interest.

For the purpose of this lecture I thought it would be interesting to compare the situation as regards child health in 1923 with that in 1963, and to review the dramatic changes which have taken place—for they have been dramatic. The principle which, it seems to me, should underlie paediatric practice is not so much to increase the average age at death from 60 years to 70 but to ensure that as many individuals as possible shall have good health for 70 years, that we should so far as is possible maintain health rather than cure a disease when it has developed. It is not always appreciated that the paediatrician sees the origin of numerous diseases—rheumatic fever, tuberculosis, orthopaedic deformities, and even peptic ulcer. By his diagnosis and therapeutic skill he may initiate appropriate treatment or even conquer an otherwise chronic illness in its earliest stages. This is very apparent; for rickets, which was so common and which accounted for so many physical deformities, is now almost absent from our child community.

Infective Conditions

Forty years ago infective conditions carried a high infant and child mortality. Gastroenteritis (especially in the summer months) took a heavy toll of infant life, the infectious fevers were responsible for lifelong disabilities in many of those who survived, and tuberculosis was feared and dreaded in all walks of life. The infant mortality rate is a sensitive index of the social and sanitary conditions of an area, just as Osler regarded the incidence of typhoid fever as a measure of the public health standard of a community.

The infectious fevers afflicted many and killed large numbers. The control of these is reflected in the following figures which give the number of deaths in England and Wales:

	1925	1961
Diphtheria	2,774	8
Scarlet fever	988	3
Measles	5,337	27
Whooping-cough	6,058	152

Tuberculosis was usually acquired in infancy or early childhood. Many died a few weeks after the primary infection; others bore the scars of their early infection until reinfection or reactivation occurred in later childhood or in adolescence. To diagnose tuberculous meningitis was equal to a death sentence. Now the disease is rare in children, and when present

is amenable to antituberculous drugs. The change in age incidence seems to have moved to middle or later life—an example of how the pattern of a disease is rarely constant.

Gastroenteritis has responded largely, in my opinion, to better social conditions, improved education of mothers in hygiene, and the outstanding services of the public health authorities in providing maternal and infant welfare centres and the school medical services. The debt we owe to these public health facilities is not always fully acknowledged. The dividend now being enjoyed is a tribute to this far-seeing policy. Further, the modern mother has better appreciation of the importance of hygiene in the care of her infant.

Infectious diseases used to be treated in fever hospitals. Now modern drugs which control so many of the organisms, with a consequent reduction in complications, have rendered these hospitals redundant. The vacated buildings are welcomed by hospital boards and are now used for the care and treatment of diseases in other generations.

Diphtheria is an outstanding example of the value of protective immunization. The number of notifications in 1925 was 47,720, whereas in 1961 it was 51. This control of diphtheria is largely the result of the immunization programme so enthusiastically received and practised since its introduction. It is a pity, and even alarming, that the proportion of infants and children immunized at present is so low. Unless there is a marked increase I believe there will be recurrences of diphtheria in communities, because periodically there are local outbreaks showing that foci of infection persist in the population. It is to be noted that very few of the present generation of doctors have ever seen an example of the disease and would not recognize the characteristic odour of the breath in the faucial type or the clinical appearance of laryngeal diphtheria.

Scarlet fever has ceased to be a menace although at one time it was a deadly illness. The streptococcus seems to have steadily lost its virulence and is readily controlled by antibiotics. Measles and whooping-cough are no longer the forerunner's of chronic lung conditions or middle-ear disease, because these results of complications can be reduced or eliminated by appropriate treatment with chemotherapy or antibiotics.

Rheumatic fever, like scarlet fever, is less common and less severe. Apart from the apparent reduction in the virulence of the streptococcus there are also the associated facts that the nasopharynx of the modern child is much more healthy and throat infections are treated in their early ages. In addition the standard of nutrition and of housing is much improved.

Planning

The face of medicine is for ever changing and there is a constant necessity for flexibility in planning. No one can foresee what new development in the understanding of disease and its treatment will take place. With the reduction in

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rheumatic heart disease in children there should be a diminution in chronic valvular disease. The cardiac surgeons may perform mitral valvotomy as rarely in coming years as the aural surgeon does a mastoidectomy in contrast to his experience 35 years ago.

Diabetes in children was fatal because dietetic control was almost impossible and the child was unable to survive the onslaught of coma and ketosis. With the introduction of insulin child diabetics survived in increasing numbers and eventually became parents—with a further possible increase of diabetic children as patients.

Leukaemia is a distressing condition for which there is as yet no successful treatment. Nor do we really know the cause, nor why the incidence is increasing so alarmingly. Intensive research will doubtless reveal the cause of this malignant disorder of the blood, and successful treatment will eventually follow.

Poliomyelitis is a dreaded disease on account of the possible major, and permanent, crippling among those who survive. We must, however, be realistic in appreciating that the number of persons afflicted is small relative to other diseases such as nephritis, tuberculosis, malignant new growths, and, in adults, coronary disease and cerebral vascular lesions. It is an index of the progress made in preventive medicine that successful immunization is now available as the result of years of intensive research. It is probable that this achievement will bear a dividend in underdeveloped countries comparable with the control of cholera, plague, and typhoid fever in this country.

Immunization is one of the success stories of my period of review. The control of infections such as diphtheria, tetanus, poliomyelitis, and tuberculosis has been an encouraging experience. So, too, has been the effectiveness of immunization against cholera, yellow fever, etc., in other countries. No doubt more diseases will be controlled as the result of research work at present in hand.

It is to be hoped that multiple immunization doses will be developed on the lines of the quadruple product for diphtheria, whooping-cough, tetanus, and poliomyelitis. The young mother is rightly worried about the multiplicity of injections advised for her young infant, and I believe that a "blunderbuss" injection would help to bring immunization towards the desired level.

Would it be out of place—or too bold—to suggest that the prevention of some diseases may be accomplished by altering the chemistry of the blood? Is there, possibly, a newer concept of immunity based on blood chemistry?

Some diseases, such as malaria, can be prevented by adding a chemical product to the blood. It is possible that future scientists may discover that certain infections are more readily prevented by some such means instead of by inducing antibody response in the individual. After all, rickets and scurvy can be avoided by suitable additions of the appropriate vitamin to the blood-stream.

Outstanding Advances

What have been the outstanding advances in the past 40 years.

Considered chronologically, the introduction of insulin has meant the survival of diabetic infants and children, many of whom are now parents. The late Sir Robert Hutchison predicted that there would be large numbers of diabetic children to be cared for by paediatricians. It was a true prophecy—now any one of us could fill a ward with diabetic children, whereas hitherto only the occasional patient was under treatment.

The discovery of the antistreptococcal power of sulphanilamide revolutionized the control of many infections. The

skill of the chemist in evolving newer and better products based on this drug has placed in the hands of the physician and surgeon a series of compounds of almost unlimited usefulness. I have no doubt that the future will bring forth more drugs based on the sulpha radical, with an increasingly valuable specificity against known infections.

The discovery of penicillin added to the satisfaction of the soul of the searcher for dramatic events. The use of antibiotics has contributed enormously to the subjugation of infections which were hitherto uncontrollable. Formerly the patient was encouraged to combat the invasion by his own antibody resources. Now diseases which were invariably fatal (tuberculous meningitis, bacterial endocarditis) or which taxed the patient's resistance to the utmost (pneumonia) are regarded almost with complacency. Operations which in the past would never have been undertaken are almost commonplace under an antibiotic "umbrella." But the availability of powerful antibiotics is no excuse for failure to observe the strict code of asepsis which was the enthusiastic practice of the surgeons of a previous generation. It is not to our credit that cross-infection in hospital wards is so prevalent to-day.

The advance in anaesthetics has given many surgical procedures an outstanding place in the drama of the operating-theatre. Surgery of the nervous system and of the chest and within the abdomen, which, while often contemplated, was never undertaken because of the high anaesthetic risk, is now performed daily. A newborn infant can have an oesophageal atresia repaired or a lung with a massive unilocular cyst removed without undue risk.

The discerning paediatrician realized the importance of normal blood chemistry just as much as the general physician. But he was frustrated by the biochemical techniques which required relatively large quantities of blood for the analyses. Now with the introduction of ultra-micro methods 8 to 10 estimations can be performed on 1 ml. of infant blood. This opens the door to further advances in diagnosis and treatment, with equal or increased accuracy without undesirable depletion of the infant's blood.

Biochemistry has introduced us to a field of study in metabolic disorders, many of them inherited. Phenylketonuria was one of the first to be added to Garrod's original "inborn errors of metabolism," and already the list of this type of disorder is increasing at a surprising rate. The advances have been inspiring, and I have no doubt that further studies will reveal a better understanding of many diseases which are at present a mystery. Some disorders of the intellect and of the mind as yet unexplained may be proved to be due to errors of blood chemistry.

Viruses have been known for some considerable time, but study was frustrated by failure to culture them. This difficulty has been largely overcome and new ones are constantly being discovered. Fifteen years ago there were 15 known viruses, now more than 200 have been recognized. Diseases whose cause was not understood have now been elucidated; but so far there is no specific treatment for them, though recent work on smallpox may reveal a method of successful therapy by specific chemical products for individual viruses, just as sulpha compounds and antibiotics have been produced with antibacterial specificity.

Clinical genetics is one of the newer interests with a wonderful field for research and investigation. Many conditions are known to have hereditary influences, and the clinical assessment of these will tax the investigative resources of those with a searching mind. Parents will seek an explanation for the occurrence of abnormalities of structure and function, as well as advice regarding the possibility of their recurrence in subsequent children. There is no doubt that the older concepts of heredity in relation to inherited disorders will have to yield to a better understanding of biochemistry and of abnormalities in chromosomes.

Importance of Being Modern

There is a tendency among some present-day teachers to emphasize the scientific aspect of medicine at the expense of the art. Many seem to have forgotten that Oliver Wendell Holmes said that science is a first-rate piece of furniture for the man's upper chamber if he has common sense on the ground floor. This omission unfortunately is reflected in the practice of a new generation of doctors and in the approach of undergraduate students. Undue weight is placed upon laboratory, radiological, and instrumental observations at the expense of bedside clinical observation. While this information may be desirable and necessary for the understanding and treatment of obscure illnesses, it should be remembered that these amenities are not available to all family doctors, some of whom will practise their profession in rural and remote areas. You must bear with me if I am somewhat critical in my assessment of some teachers of the present generation. It seems to me that undue emphasis is placed on the ancillary and auxiliary aids and that the precept of the Chinese of 2,000 years ago that the art of diagnosis lies in observation, auscultation, interrogation, and palpation has been forgotten. To these Auenbrugger, in 1771, added percussion, and Laennec perfected auscultation.

Many modern students have discarded the stethoscope and demand an x-ray examination of the chest and an E.C.G. for diagnosis. One eminent cardiologist stated that the older he got the more he depended upon the stethoscope. I would suggest that the stethoscope achieves a close doctor-patient relationship, because the patient is at one end and the doctor at the other. The child is full of wonderment at and interest in this amazing apparatus, which can hang from the doctor's ears and convey so much information as to why he is sick.

I appreciate to the full the necessity for specialized investigations in an attempt to make a precise diagnosis, to give an accurate prognosis, and to prescribe specific treatment. But it must be realized that all of these are not, and never will be, available to every doctor in all circumstances for every sick person. The purpose of these investigations must be correlated with bedside observations so that the discerning doctor may recognize that certain clinical findings are associated with related metabolic or other disturbances of function. Thereby the best practical use will be made of science for the proper practice of the art of medicine.

In the treatment of disease one is faced with the attitude that therapy began with the introduction of penicillin 20 years ago and that what cannot be cured by an antibiotic must be overcome with the newest corticosteroid. A multiplicity of tranquilizers of varied complex chemical composition are available; hypotensive drugs, diuretics, and anabolics vie with one another to attract the patronage of the doctor—usually the younger members of the profession, but too often the older brethren, who ought to know better, yield to the temptation of the advertiser. We must avoid attributing far too many of our successes to the potency of the drugs we use, and far too little to psychological mechanisms and to the tendency of many diseases to remit spontaneously (Wayne, 1954).

Side-effects of Drugs

Many years ago Osler emphasized that drugs had side-effects which might make the patient's condition worse instead of better. He depended upon less than half a score of remedies. Now there are something like 100,000 pharmaceutical preparations on the market and the rate of increase is about 10% each year. As teachers in therapy we ought to emphasize that antibiotics are not necessary for minor ailments and have the disadvantage of being potent allergens with very unpleasant, even dangerous, side-effects; that some tranquilizers are dangerous, especially to the mother in early pregnancy and to certain individuals; that corticosteroids should be used only

for the treatment of diseases for which they are the sole and a proved remedy and which do not respond to remedies of more conventional type. If given in too large a dose or in a disease for which there is not a definite indication unpleasant irreversible effects may occur. The list of possible side-effects is a frightening one, and includes hyperadrenalism, endocrine depression of the thyroid and gonads, potassium deficiency, psychoses, peptic ulcer, occult oedema, Cushing-like syndrome, secondary infections, increased susceptibility to infection, and purpuric and thrombo-embolic phenomena.

Surely our profession should discourage the widespread use and availability of tranquillizing drugs. Apart from increasing the proportion of suicides due to barbiturate preparations, they are habit-forming and cause subsequent depression which demands a "pep pill" to reactivate cerebral activity.

The enormous increase in the armamentarium of the modern doctor is embarrassing. The young physician must realize that human individuals are not mass-produced, each with an equal capacity for output (physical or mental), and each with an identical reaction to an insult, whether of illness or drug therapy. The need for discrimination and a lot of scepticism on the part of the doctor is greater than ever. Perhaps some day a copy of Sir Robert Hutchison's (1953) modern litany will adorn a wall in every surgery and be prominent in every hospital department:

"From inability to let well alone; from too much zeal for the new and contempt for what is old; from putting knowledge before wisdom, science before art, and cleverness before common sense, from treating patients as cases, and from making the cure of disease more grievous than the endurance of the same, Good Lord, deliver us."

The indiscriminate use of antibiotics is worthy of criticism. These are valuable remedies, and future generations will bless their discovery and usefulness; but their use should be confined to real necessity and not prescribed on every occasion of a malaise or as an "umbrella" to conceal imperfect aseptic technique on the part of the surgeon. The increase in patient-days in hospitals since the widespread use of antibiotics was introduced is alarming and unjustifiable.

Antibiotics are not for minor illnesses and the "umbrella" should be erected for impending storms and not for mere showers. Prescribed indiscriminately they are often a burden on the patients' and the public purse as well as a possible detriment of the patients' health. "Many of the modern generation of doctors seem to have forgotten that Nature provides the first, and often the best, line of defence against infection, and that the only role of the antibiotic is to support and supplement Nature's defences where these are inadequate" (*Practitioner*, 1957).

Premature Infants

The survival of the premature infant has been one of my major interests since my early days as a paediatrician. There are no accurate records of the fate of the premature infant 40 years ago. Information from my contemporaries and my own personal recollections are that 20% or less survived. But by observation of the premature infant and the knowledge of the cause of death it was possible to evolve some simple basic principles upon which a better record could be achieved. Now the survival rate in this country is over 80% and in some centres almost 90%. Until some years ago it was a belief that the survival of a premature infant was neither desirable nor necessary: it was thought that survivors would be weaklings of low physical, mental, or psychological calibre. This belief took no notice of the high standard of intellectual ability and physical fitness many of these individuals attained in adult life. More than a few famous men and women in the past were born prematurely, and if they had failed to survive—science

(Newton), the arts (Goethe), and politics (Churchill)—the present generation would have been the poorer.

There is need, however, for a massive review of the survivals among the prematures. This demands an assessment of their physical, mental, and psychological qualities. This must be on a large scale because local investigations cannot reflect the picture as a whole in the community at large. My own experience seems to show that the cause of the premature delivery is very important and that those born to mothers suffering from toxæmia or hypertension with kidney damage are probably the less favourable in ultimate result.

Quo Vadis ?

And what of the future of paediatrics ?

In my student days and early years as a qualified doctor the diseases of children were regarded as a Cinderella. Their illnesses were associated with soiled napkins and temperatures ; with crying infants unable to help by giving a history or locating a pain ; with older children whose terror was the memory of the handle of a large spoon having been thrust into the mouth to inspect the throat. Admission to hospital was often regarded by the parents as an intimation that the illness was hopeless and that the patient would not emerge alive. Post-mortem examinations were regarded as against certain religious and spiritual beliefs.

How different now ! The mother brings her child to the hospital out-patient department with the realization that admission may be essential and indeed desirable. She is prepared to be separated for a few days or for a prolonged period to ensure that the child is cured and is not to be the victim of some chronic illness that would incapacitate him permanently or render the remainder of his life one of invalidism. There is a different approach to the psychological reactions of the sick infant and child. Visiting in hospital is extended and is largely unrestricted, with increased reassurance of the parents and happiness of the child. Child psychiatry is in a phase of progress and many children's hospitals have a child psychiatrist on the staff.

Children's Hospitals

A children's hospital is invaluable: specialized investigations are "geared" for the subject. The hospital architecture and furniture are adapted to the comfort of children. The radiology department is equipped with apparatus suitable to the patient, and the radiographers are trained in the special techniques applied to infants and children. The laboratories have been made more useful by the introduction of microbiochemical methods which permit many investigations to be carried out on small quantities of blood. The services of the nursing staff who are trained in the care of sick infants and children are invaluable.

In my opinion there is a need for a limited number of highly efficient children's hospitals—not more than one for each region outside London. These hospitals would be equipped and staffed and maintained for high-level diagnosis and treatment. To them would be referred patients requiring specialized facilities for diagnosis and treatment. The cost of establishing and maintaining one of these hospitals would obviously limit their number.

These developments in paediatrics have taken place in a couple of generations, and I hope the policy of preserving children's hospitals will be maintained, rather than that they should become mere adjuncts or departments of general hospitals. I realize that it would be administratively tidy to develop large general hospitals which would include all special departments, from the sick infant to the geriatric patient. I maintain that children's hospitals as such (without other than

the routine needs for standard diagnosis and treatment) should continue to exist, so far as is possible as autonomous units. I submit that the desire for administrative convenience in the hospital service is not necessarily in the best interest of the paediatric patient, and that if the policy of absorbing infants and children into general hospitals without regard to the special needs is pursued there will be eventually a reversal of the policy.

It is possible that the general consultant physician who used to regard the paediatrician as something of a "poor relation" is now envious of the wonderful field created by the study of illness in early life and is anxious to "get on the band wagon" so that the developments in congenital heart disease, metabolic disorders, and haematology may once more come under his direction.

What of the paediatrician ? He is trained to learn by listening to the history of the illness, to observe his patient, and to make a diagnosis as far as possible at the bedside. The "modern" general physician (especially the most junior in hospital) makes out a lengthy impressive list of special investigations to be undertaken, based probably on an indifferent personal history and on only a cursory physical examination. I maintain that a paediatrician is more competent to deputize for a general physician than vice versa ; just as I hold that a children's trained nurse would make a better attempt to attend an ill adult than a general trained nurse to care for a sick infant.

The Future Paediatrician

And what of the role of the paediatrician in private practice ? One of the many problems facing the paediatrician of the future is how he is to order his professional life in the face of changing conditions. For more than a generation consultant paediatricians have multiplied until now they number 280 in the United Kingdom. Forty years ago fewer than a dozen physicians devoted their professional activities to paediatrics ; many eminent physicians made their livelihood as consultants in general medicine while displaying a lively and deep interest in sick children, and thereby advanced paediatrics. They influenced many junior colleagues to devote themselves to the special study of illness in infants and children, and these are now the more senior paediatricians.

With the possible impending changes in hospitals in relation to child patients is the fate of the consultant paediatrician doomed ? Are university chairs of child health to be merged in departments of general medicine ? With the introduction of group practice (to include a paediatrician in the team) is the necessity for the consultant paediatrician going to diminish, except for some very special paediatric problem ? Is the paediatrician of the future to be a research worker, interested only in the study of the cause and cure of disease so that from his laboratory he may supply new facts on aetiology and therapy to the paediatrician working in the field of group practice ? Will the paediatrician feed into a computer the known facts (as his colleagues in other fields may be doing) and in a matter of seconds be supplied with the diagnosis ?

It seems to me that consideration as regards the future of paediatrics must take heed of the impressive development of group practice and the use of family doctors in the hospital service. Changes are in operation already and the momentum is likely to increase. It is of considerable importance, therefore, for the young paediatrician to realize what evolutionary processes are taking place and to adapt himself and his training to the changing circumstances.

He must not allow the pursuit of scientific medicine to blind him to the practice of the art. Paediatrics is not suited to this approach. The fundamental understanding of the nature of disease and its cause is the true basis upon which rational treatment must be based. New scientific specialties or disciplines arise in accordance with the increasing subtlety of medical

problems. The study of anatomy was at one time paramount. This was followed by the study of the functions of body structure, the science of physiology, while the changes in physiological function became the study of pathology. A better understanding of pathology, assisted by the advancing knowledge of chemistry as applied to treatment, was responsible for the study of pharmacology—the precise effect of drugs upon the human economy. The interest in chemistry led to a new discipline—the chemistry of human metabolism, biochemistry—in which the minute and complex changes which occur in the tissues, the blood-stream, and organs of our complicated human mechanism are critically investigated. Microbiology has made striking advances, particularly in the study of virology. Allergy

has had its phase, and now autoimmunity is in the limelight. But none of these disciplines can be allowed to supersede or replace the art of clinical medicine as practised at the bedside of the patient of whatever age.

It has been said that old men dream dreams and young men see visions. I hope I am young enough to see the prospect of a wonderful future for paediatrics in the next 40 years.

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Snuff—Its Use and Abuse

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When they talk'd of their Raphaels, Correggios, and stuff,
 He [Reynolds] shifted his trumpet, and only took snuff.
Oliver Goldsmith.

Sneezing is not only the most effective way of cleansing the nose—it has for countless generations enjoyed an important place in mythology and religious dogma throughout the world.

Substances which when deliberately introduced into the nose produce this “beneficial” and happy reflex action are termed sternutatories or snuffs, and have been employed for medicinal purposes since the time of Hippocrates. In this modern age, however, most snuffs contain finely ground tobacco, and, although avidly consumed by “dippers and snuffers,” convey no beneficial properties—except perhaps to the Inland Revenue.

A Frenchman, André Thevet, first introduced tobacco into France from Brazil in 1556. Jean Nicot, French Ambassador to Sebastian, King of Portugal, reintroduced it in the form of snuff in 1559, as a cure for migraine. The generic name *Nicotiana* is derived from Nicot's surname and has been in use since 1570 (Watt, 1953).

All too rapidly, however, the stimulating properties of the tobacco led to widespread habit-formation, and by the end of the century it was the commonest form of social addiction in France.

Curiously enough, snuff became popular in Britain only at the time of the Great Plague (1665), when it acquired the reputation of a powerful prophylactic—as well as being efficacious against unpleasant smells! The Scots accepted this new habit so enthusiastically, and consumed such large quantities, that the effigy of a Highlander has signposted snuff-shops ever since (Fig. 1). By the end of the seventeenth century snuffing had become an essential part of the fashionable way of life, but the great period of snuff-taking in Britain came during the reign of George III and his wife Charlotte (1760–1820). The Queen was so addicted that she received the nickname “Snuffy Charlotte”; but most of the great personages of this period, male or female, doctor or dandy, were devotees. Lord Nelson, the Duke of Wellington, Marie Antoinette, Napoleon, Disraeli, Pope, and the famous Dr. Samuel Johnson all refreshed themselves with a pinch of snuff—usually taken from a beautifully decorated and often valuable snuff-box (Fig. 2). It is recorded that the only medicine that Dean Swift took

for his Menière's symptoms was “some herb snuff prescribed by Dr. Radcliffe,” an eminent physician (Wilson, 1957).

The vogue continued until the middle of the nineteenth century, gradually being replaced by other and more lethal forms of tobacco addiction. Since the last war there has been definite evidence of a revival, and the United States Department of Agriculture estimated that 34,000,000 lb. (15,422,100 kg.) of snuff was sold in 1961, almost all within America, with Tennessee possessing the dubious honour of being both the leading producer and the leading consumer (Rosenfeld and Callaway, 1963). In London snuff-shops still exist which offer over 50 different blends, and the mills of Sheffield and Kendal produce and export considerable quantities to all parts of the world.

Preparation

Details of the techniques employed in the manufacture of snuff are closely kept secrets, but in this country it is usually blended from finely ground tobacco leaf and stalk which has previously been fermented in a salt solution and subsequently “cured.” It is then ground and perfumed, but the real skill lies in the blending.

Oriental snuff, consumed in countries such as Thailand, differs considerably both in preparation and in constituents from that popular in the Western World. Its composition is approximately 50% dry tobacco and 50% Oriental gum, with a small amount of powdered cuttlebone added. The gum is made by heating “white earth” at high temperatures in a kiln,

FIG. 1.—Wooden effigy of a Highlander.

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