

MODERN ANALGESICS

Ever since Sertürner first isolated morphine from opium in 1816 the search has continued for the ideal analgesic. Morphine continues to be the most efficacious remedy for severe pain and remains to this day the most widely used analgesic drug. But its undesirable side-effects, including the tendency to cause addiction, have led organic chemists to seek effective substitutes, and elsewhere in this issue Dr. P. W. Nathan describes a clinical study in which some of the newer synthetic drugs have been compared with each other and with morphine.

Such a clinical trial can be effectively carried out only when the subjects experience fairly severe pain. Asher¹ has shown that, if the pain is of mild or moderate severity, some relief can be given to 50% of subjects by inert tablets administered by mouth. Nathan's patients had severe, chronic pain which never disappeared spontaneously, and the results, assessed by the subjective but reliable method of Professor Keele's "pain charts,"² go far towards confirming the clinical value of pethidine and amidone. The doctor's traditional $\frac{1}{4}$ gr. (16 mg.) of morphine is shown to have the same analgesic effect as 125 mg. of pethidine, or 12 mg. of amidone. On occasion, 2.5 mg. of the latter can be an effective dose. Morphine has the great advantage that by increasing the patient's sense of detachment from his environment, and by relieving apprehension, it induces a mild euphoria and drowsiness which in certain circumstances are most desirable. Such an effect can be obtained with the other drugs, except in larger doses, only by the simultaneous use of a barbiturate sedative. The oral and parenteral doses of amidone and pethidine are similar, but the side-effects, which resemble those of morphine, were more common after injection in Nathan's patients. Of the several new drugs tested, no single one was found to be less toxic than the others; intolerance to one drug did not imply that the others could not be taken, and it is therefore useful to have a selection from which to choose for the sensitive patient. In Nathan's experience, addiction to these drugs did not develop in any patient after a successful pain-relieving operation had rendered the further administration of the analgesic unnecessary. His trial has confirmed the general experience that phenadoxone is not a clinically useful analgesic, despite initial reports.³ Inconsistent results are obtained from oral administration, and the injection of even 20 mg. may be dangerous.

The practitioner is frequently besought by his patients to provide relief for pain, and it is only infrequently that these powerful remedies need be used. Aspirin and phenacetin are effective and useful, and a sedative effect is obtainable if a barbiturate is combined with them. Modern soluble preparations of calcium aspirin are pleasant to take, and the side-effects are minimal. The reputation of codeine as a pharmacologically useful drug is at present waning, for the analgesic effect of the compound tablet of codeine B.P. is probably due more to its content of aspirin and phenacetin than to the $\frac{1}{4}$ gr. (8 mg.) of codeine present. It is a weak analgesic

even when given in full doses, and, furthermore, its efficacy as a depressant of the cough centre has been recently challenged by Hillis.⁴ His results showed that its effects were no greater than could be explained by suggestion, a finding which has surprised many doctors who have prescribed it for years with enthusiasm, faith, and apparently satisfactory results.

ROTTEN TEETH

The two common dental diseases, caries and pyorrhoea, are diseases of civilization, but, being only rarely the primary cause of death, their prevention lacks the drama attending the prevention of many other diseases. In general, people have grown used to preventive medicine exercising its powers by rapid and simple means, and have for long taken for granted that the public health authorities will protect them from sanitary and environmental hazards without much personal interference. But for a man to change his dietetic way of life is another matter, and only a few seem prepared to undertake this either for themselves or for their children. In accordance with the generally accepted views of the dental profession, a recently published Scottish report¹ attributes the ravages of dental caries mainly to the presence of fermentable carbohydrates in the mouth at most times of the day and night, and it gives excellent advice on a regime of diet to prevent this state of affairs. Assuming, however, that this is a monumental task to accomplish, the report draws attention to the possibilities of fluorine as an agent to inhibit the onset of caries. But whether fluoridation of public water supplies is a sound measure is at present debatable.

The great advances in dental surgery and anaesthesia during this century have made young people to-day accept regular dental treatment as part of their ordinary lives. Consequently they tend to rely on their dentist for the care of their teeth and not upon any efforts of their own. The demand for skilled treatment, particularly for children, has therefore increased in Scotland, as elsewhere, but in that country there are only 1,350 dentists for a population of 5,000,000. Inevitably the local authority dental services for children and for expectant and nursing mothers, in Scotland as in England, are in a bad way. Recruitment is adversely affected by comparison with the possibilities of a career in the other branches of the Health Service. Only one schoolchild in six in Scotland is annually receiving systematic dental care. The Whitley scale agreement has helped to stop the drift from the school dental service, but lack of opportunities still deters men dentists from joining it. A recent circular from the Department of Health² cites an encouraging improvement in staffing, though in the absence of figures a proper assessment cannot be made.

The shortage of dentists in Scotland has led the committee that prepared this report to recommend that the school service be augmented by ancillaries such as New Zealand has. It emphasizes that "nothing should

¹ *Lancet*, 1948, 2, 771.

² *Ibid.*, 1948, 2, 6.

³ Wilson, W. M., and Hunter, R. B., *British Medical Journal*, 1948, 2, 553.

⁴ *Lancet*, 1952, 1, 1280.

¹ *Preventive Dental Services*. Report by the Subcommittee of the Standing Dental Advisory Committee of the Scottish Health Services Council. H.M.S.O. 1952.

² D.H.S. Circular 87/1952.

interfere with the training of dentists or retard the development and enlargement of the dental schools," but ignores the danger that the introduction of women trained to carry out much of the daily work for long carried out by dentists may adversely affect recruitment, not only to the school service but to the dental profession itself. The committee apparently assumes that the New Zealand type of ancillary would also take the place of the oral hygienists at present working in a number of local authority schemes, whose work is becoming appreciated as an important link in the chain of preventive dentistry.

The report covers all the dental services with great thoroughness, including orthodontic treatment. A pilot scheme in Fife, based on a consultant clinic decentralizing the simpler work on to school dentists themselves, has actually been working under the auspices of the committee. The volume of work reported from this pilot scheme may cause controversy, particularly the reference to an average period of five minutes for diagnostic consultations. Orthodontic opinion is unanimous that success in treatment is based on thorough diagnosis, for treatment is usually protracted and expensive. The Fife scheme appears not to have progressed as far as many school orthodontic clinics in England. Many now believe there should be a close association between psychiatry and other branches of medicine when investigating the aetiology of diseases, but this is signally lacking in studies of malocclusion. Crichton-Miller has for long emphasized the relation between teeth and psyche, and there is undoubtedly a field for joint research into the psychology of aggression in relation to teeth. Refreshing indeed is a special reference in the report to the importance of breast-feeding, particularly nowadays when the significance of this time-honoured yet humble process is out of fashion in orthodontic thought.

The committee reveals that an adequate school and priority dental service in Scotland would require a rate ranging between 1d. and 2½d. in the pound. The ability and resources of local government to develop modern health services have come in for serious consideration since 1948, but, so far as preventive dentistry is concerned, finance would not appear to be a particularly formidable obstacle to progress, in Scotland at any rate.

RESULTS OF VACCINATION

There can be few medical procedures more firmly established and more widely used than vaccination against smallpox, and yet there are still surprising differences of opinion on the correct interpretation of the different types of local reaction after vaccination and revaccination. Mitman¹ has recently presented a clear statement of his views on this question, and these should be helpful to practitioners who have to decide on the significance of the results obtained in their patients as well as to those responsible for framing the form of vaccination certificates. He distinguishes between two types of local reaction: those due to *multiplication* of the

living virus and those due to *sensitivity* to the virus, dead or alive, and its products—and, it might be added, sensitivity to the tissues of the animal from which the vaccine lymph is prepared. Unvaccinated persons and those whose immunity from previous vaccination has lapsed respond with the characteristic primary type of reaction, which is maximal between the seventh and tenth days. Those with some residual immunity respond with a modified lesion which runs its course rapidly and reaches its maximum intensity between the third and seventh days; this reaction is usually called *vaccinoid* or *accelerated*. Mitman, however, maintains that the term "accelerated" is a misnomer, since in his view the impression of acceleration is due to an early sensitivity reaction: the onset of the modified reaction may even be slightly delayed. Since, in fact, this reaction reaches its maximum before the seventh day there are many who will still consider that the term "accelerated" is a fair description.

The sensitive person, whether susceptible or immune, responds to the virus, dead or alive, with an early reaction on the second or third day: this has been called the immediate reaction of immunity, but it is neither immediate nor a reaction of immunity. It may occur in those whose immunity has completely lapsed, and, since sensitivity persists after immunity wanes, revaccination may result in a combined early and vaccinoid reaction. Vesiculation may occur in sharp early reactions, but the vesicle differs clinically from the true vaccinal vesicle: it is usually very small, does not spread laterally, is itchy and easily ruptured, and leaves no scar. The early reaction is not an indication of immunity, although it may occur in those who are immune; it is evidence only of previous sensitization to the virus or to the animal proteins in the lymph. Mitman could obtain no evidence that exceptionally severe early reactions were due to the quality of the lymph used.

No reaction at all has been regarded as evidence of complete immunity, but is more commonly due to errors of technique or relatively inactive lymph. Mitman shows that technical failures can occur with surprising frequency even in the hands of experienced vaccinators. Although it is true that no reaction may be obtained in highly immune people who have been relatively recently vaccinated, absence of reaction should never be accepted as evidence of immunity without repeated revaccination with a lymph proved to be potent in susceptible subjects vaccinated at the same time. Mitman reports that severe local reactions and general disturbance due to secondary infection of the vaccinal pustule can be reduced by the use of penicillin tulle gras dressings and that this does not affect the development of immunity, since the virus is not sensitive to penicillin.

THE RAILWAY DISASTER

Serious accidents on the railways of this country are fortunately very uncommon, so that the occurrence of such a major disaster as the one at Harrow and Wealdstone station came as a great shock to the public mind. Everyone has been filled with admiration for the promptness and devotion shown by the various rescue parties,

¹ *Mon. Bull. Minist. Hlth, Lond.*, 1952, 2, 100.

and the thanks of the community are particularly due to the medical unit of the American Air Force which rendered such signal service to the wounded. It was in no sense of carping criticism, therefore, that the two letters were written which appear in our correspondence columns this week. After every such emergency it is wise to review the procedure adopted in bringing first aid to the injured and to search thoroughly for any, even the slightest, weakness in the arrangements provided.

Our correspondents call attention to one matter of major policy and several minor details of treatment. The major question is whether there should be a system throughout the country whereby, in case of sudden emergency or serious accident, a fully equipped surgical (or medical) unit could on request always be promptly dispatched to the site of the disaster. Such units could be based on the nearest large hospital, and the arrangements would have to be made through the chief hospital centre for the area or region so that sufficient help might be sent and yet no undue overlapping occur. In the case of the Harrow disaster many hospitals were notified that they might have to receive casualties, and some stood by for a long while before being told that they would no longer be wanted to receive them. There was a precedent for such surgical units during the war, when surgeons and surgical equipment were dispatched urgently to places where surgical aid was suddenly called for. It might be argued that such units would seldom be needed, and that it would be waste of time to set up an organization which would only occasionally be required; but a skeleton service of such a nature would be of the greatest help if the threat of war ever became serious again.

The minor questions of treatment concern the injection of morphine, the giving of transfusions before the patient is sent to hospital, and the administering of drinks to those who are able to take them. Certainly it should be a routine practice for those who inject any morphine (either subcutaneously or intravenously) to indicate in some manner and on some substance which cannot be detached from the patient the exact dose which has been administered and the time of injection. Whether a transfusion should be given to a patient before he reaches hospital should depend on the judgment of the skilled surgeon who sees the patient. The giving of tea or other drinks is contraindicated if there is the slightest suggestion or possibility of any injury to the abdominal contents, but otherwise there would not appear to be any serious objection.

GROWTH OF CHILDREN

Aberdeen University Court is to be congratulated on publishing records of the growth of children from birth to 5 years of age made by the late Professor Alexander Low,¹ anatomist and anthropologist. The absence in Britain of measurements of the same children over a period of years—so-called velocity or longitudinal studies—has often been lamented in these columns² and in the general literature. There was perhaps a despondent sigh in our comment last year, "Unfortunately such longitudinal surveys are slow and laborious."³

Tanner⁴ has drawn attention to the astonishing fact that hitherto there have been no British standards for any anthropometric characters except height and weight, and has insisted that "all anthropometric measurements, including height and weight, need considerable care and effort in the taking, and unless done properly are not merely useless but confusing." It is seldom that authors state explicitly their methods of measurement and the exact points used, a circumstance that renders comparative assessment of data in different papers exasperating and often futile. The Aberdeen figures are informative and remarkable in that the methods of measurement have been carefully described and carried out by means of some 20,000 observations by the same person, an experienced anatomist and anthropologist, recording the growth of 66 boys and 60 girls at the ages of 3 days and 1, 2, 3, 4, and 5 years. They were all normal children of north-east of Scotland stock. The careful nature of the work may be judged from the measurements included: weight, head length, breadth, height, and circumference; face length and breadth; nasion-alveolus; chin-occiput; standing, sitting, suprasternal, umbilical, and pubic height; mid-fingertip height; trunk length; bisacromial width; bitrochanteric width; foot length; chest circumference; anterior fontanelle; number of teeth; length of left cubit; cephalic and facial indices; sitting-standing ratios; weight-height ratios and chest-girth ratios. Also recorded was such general information as the ages of the parents, number of pregnancy, month of cutting first tooth, and whether bottle- or breast-fed. Some writers state that the circumference of the calf is a good measure of muscular development, and it is interesting that Low has not included this in his list. Anatomists teach that the longer the leg lever the less the calf, and anthropologists state that thick calves are characteristic of Europeans and thin calves of the darker races. Possibly the calf is not the reliable measure it might at first appear.

According to the foreword by colleagues well aware of Professor Low's convictions, he profoundly disagreed with the current statement that children of to-day are taller and heavier than formerly; he maintained that, however excellent the nutrition received by certain children, they would not grow beyond the size of their type, and he was convinced that even if food was poor, provided a child got sufficient, it would reach the stature for its particular stock. When we reflect that this serious statement was made by one who at least had gathered the facts we may in turn have serious reflections on public expenditure and political claims made on inadequate data.

To have followed these children up to 5 years must surely have required a deal of patience, tact, and tenacity. From this age onwards it may be within the province of the school medical services to further the study. Certainly workers in this field now possess reliable velocity records of growth during the first five years of life.

¹ *Growth of Children, 66 Boys and 60 Girls Each Measured at Three Days and at One, Two, Three, Four and Five Years of Age*. University of Aberdeen. 1952. 10s.

² *British Medical Journal*, 1952, 1, 963.

³ *Ibid.*, 1951, 1, 403.

⁴ *Arch. Dis. Childh.*, 1952, 27, 10.