Thirty-five years ago Brockman published his notable monograph, *Congenital Club-Foot*, for which he was awarded the Robert Jones Gold Medal. This issue of the Journal includes contributions from Miss Wynne-Davies whose essay on the same subject has received similar recognition. It is both instructive and chastening to consider these two papers together and to reflect upon the progress that has been made during the years that separate their presentation.

In the first of her two papers Wynne-Davies considers the etiology of “idiopathic” club foot and concludes that both genetic and mechanical factors within the uterus combine in variable degree to determine the development of the deformity. Brockman regarded the significance of hereditary influences difficult to apportion but accepted that they have an effect. Wynne-Davies has, however, been able to establish them in their rightful place by modern methods of genetic analysis of families of index patients. It is more difficult to assess the importance of intra-uterine environment on the development of the growing child, because direct measurement of amniotic fluid volumes and pressures does not commend itself. Brockman advanced the well known and cogent arguments against the mechanical theory and finally dismissed it, whereas Wynne-Davies joins the protagonists and so aligns herself with, among others, Hippocrates and Denis Browne.

In the second paper we are reminded that the results of treatment remain a justifiable source of dissatisfaction; for even in the able hands of the Exeter surgeons the outcome is disappointing in no less than half the feet treated. It is indeed very doubtful whether any group of surgeons who are prepared to submit their results to such strict criteria of final assessment can claim a lower proportion of unsatisfactory results.

This is an undeniably disheartening state of affairs which is in no way redeemed by the knowledge that little or no improvement has occurred since Brockman’s review was published. There must indeed be few, if any, conditions commonly seen and treated by orthopaedic surgeons with such patient, dedicated and time-consuming attention that merit such a stigma. This timely reminder should surely encourage us to examine anew our established precepts lest one (or more) false doctrine may have unworthily achieved the dignity of an article of faith.

In any such analysis we can probably assume general acceptance of the proposition that any one foot submitted to any one method of primary correction responds the more kindly the earlier this is applied. This established, the rest is controversial, and generalisation forms the basis of argument. Although it is probable that the earlier correction is established the less the likelihood of relapse, this is not inevitably so, for spurious correction is as easy to commit as it is difficult to recognise in the very young, and sometimes dorsiflexor and evertor weakness, of uncertain cause, becomes manifest later to mar the early promise. In general, too, the worse the original deformity the more difficult the correction, a situation that is commonly met in bilateral deformity in which one foot is usually more deformed, rigid and resistant than the other. The fact that this is not always so prompts the question: “What are the features that are likely to make a club foot resist treatment?” Once again there is no ready answer and in this we are hampered by having neither reliable standards nor methods by which
we may describe or illustrate the severity (especially rigidity) of the deformity when it is first seen.

We have furthermore no reliable information to guide us in choosing between the three commonly used methods of primary fixation: strapping, plaster-of-Paris, or splints which are usually of the Denis Browne pattern. Although repeated manipulations are accepted as paramount to the success of each, the technique, force and frequency with which they should be carried out depends largely upon the whim or convenience of the surgeon.

It is vitally important that we establish which method is most likely to succeed in the very young baby, for as in congenital dislocation of the hip early and successful conservative treatment is not only the best guarantee against relapse but simplifies the management if this should occur. The criticism that the feet or hips that respond to conservative treatment are only the easy ones is nebulous, for we must seek success wherever it may be found in both these conditions.

The type of fixation employed will depend largely upon the surgeon's attitude to the need for very frequent manipulations which require the cooperation of both the mother and the physiotherapist. If he favours this policy strapping will have obvious advantages over splints and plasters which attempt to maintain whatever correction is obtained by formal manipulation, by the surgeon himself, at far longer intervals. Furthermore tradition dictates that in manipulation correction of the forefoot should precede that of the heel and that equinus should be attended to last of all. But is this in fact a logical approach? Is it by chance that in congenital deformity the foot is fixed in either equino-varus or calcaneo-valgus and never equino-valgus or calcaneo-varus? Concerning this, Attenborough has made the important observation that in the normal baby hind foot valgus is only possible in calcaneus and varus in equinus. This implies that the position of the ankle favours either valgus or varus of the foot and that correction of equinus warrants a higher priority.

Robert Jones, discussing the early treatment of club feet, rightly insisted "that the goal may be reached successfully by different routes." Today it would indeed be helpful to know what the final score is likely to be.

With so much to be learnt about the factors which favour success in infancy, it is not surprising that when confronted with a club foot that has defied primary correction, or once seemingly corrected has relapsed, we are sometimes uncertain as to which of the confusing array of alternative policies or methods to follow. It will be generally agreed that not all relapsing club feet continue to progress to an extent that deformity is incapacitating in its own right, especially if some mobility is maintained; indeed, moderate deformity with good movement is very often compatible with long-lasting good function. Relapse is not necessarily therefore an indication for operation. Unfortunately, however, we cannot at present distinguish those feet in which serious deterioration is probable, for we are ignorant of the factors that determine this course, but we can at least try to avoid prolonged periods in plaster, forced manipulations and those operations which also tend to reduce such precious mobility as remains. In this way we may at least avoid the harm which too often follows ill-considered interference at this stage. Posterior release, tendon transplantation and Dwyer's calcaneal osteotomy have obvious advantages in this connection, and, when not contra-indicated, are to be preferred to operations which depend upon rearrangement of the tarsal bones by extensive soft-tissue dissection or osteotomy. Although medial soft-tissue release continues to be practised by many surgeons, it is perhaps significant that Brockman himself abandoned it because a rigid and uncorrectable valgus deformity sometimes followed and this was more disabling than the varus it replaced.

Great energy is sometimes expended on the correction of persistent forefoot varus; but is this really necessary? It is certainly excessively rare for an adult patient to complain of symptoms solely attributable to this deformity, unless of course continuing varus of the hind foot enforces an added supination. Even the final solution—tarsal arthrodesis—is no longer
beyond reproach. Unless the foot is both deformed and stiff, calcaneal osteotomy alone may
be a preferable alternative, for it achieves correction of the troublesome varus of the heel
while preserving such movement as remains.

Club feet will doubtless continue to challenge the skill and ingenuity of orthopaedic
surgeons, but so long as so much fundamental knowledge eludes us, our practice will also
continue to be flavoured by a certain ingenious empiricism. Art has had its day. Let us
now resolve to concentrate on the science of orthopaedic surgery. Controlled therapeutic
trials based on accurate preliminary clinical and radiological assessment are no less likely to
be rewarding in this complex disorder than they have proved to be in other equally unpromising.
It would indeed be humiliating if our endeavours during the next thirty-five years are as
generally unproductive as those of the last. G. C. Lloyd-Roberts.

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TREATMENT OF FRACTURES OF THE TIBIAL SHAFT

The only way in which a surgeon can help a fracture to unite is to ensure that the fractured
bony surfaces are placed in contact and that they remain so continuously while union occurs.
He cannot promote union: he can only create conditions that favour the natural process.
It may or may not be possible in a particular instance to appose fractured surfaces by
manipulation, but the earlier reduction is attempted the easier it is to accomplish. When
reduction has been secured the second aim in the treatment of a fracture is to maintain
apposition, and success in this depends on the stability of the fracture. A transverse fracture
is inherently stable whereas an oblique or spiral one is not, and before the haematoma becomes
organised it is often possible to engage the "teeth" of a stable fracture in a position of
anatomical accuracy, with full confidence that the position will be maintained. In unstable
fractures muscle pull and gravity are the deforming forces that tend to produce angulation,
rotation and shortening.

It is tempting to suppose that all the difficulties of reduction and immobilisation can be
overcome if the manipulation is performed under direct vision and if the reduced fracture is
then held rigidly in anatomical position by an internal splint. The use of antibiotics and the
development of inert metals have made this goal, distantly glimpsed by our predecessors, a
practical possibility. So we have in our hands a means of treatment by which all fractures
can in theory be reduced and maintained in perfect anatomical position with none of the
worries and difficulties associated with conservative methods.

If this were the end of the story there would be no argument, no division of surgeons
into conservative and operative schools; but it is not. However attractive the possibilities of
operative treatment may seem, operation still entails the conversion of a closed fracture into
an open one, and the consequent risk must be weighed against the theoretical advantages.
Though the risk may be small when the operation is undertaken by an expert, few would deny
that the picture is very different when considered as a whole. Fractures are common, and
open reduction and internal fixation provide an easy anatomical and mechanical exercise
which is often delegated to inexperienced operators. There can be few surgeons who have not
seen a metal plate, firmly fixed in devitalised, ununited bone, shining in the depths of a
suppurating wound.

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