COMMON FOOT AILMENTS*

BY

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Abnormalities and deformities of the feet causing pain and disability are so exceedingly common that the difficulty is to choose conditions which can be described and discussed with profit within a reasonable space. I am told that the average medical practitioner is ignorant of them because there is no literature in which he can read about them. This is not strictly true, though one must admit that the textbooks dismiss the subject with very few words and that only the specialist is likely to read the journals or buy the books in which full descriptions are given. It is in the hope that help can be given that I have dared to produce this résumé.

The medical profession is privileged to see the private life of the public, to enjoy confidences not given to any other, and is at times burdened with the responsibility of making or marring a life. The orthopaedic surgeon's responsibility is, very often, to restore an injured workman to full earning capacity or to relieve the foot troubles of those whose life is, to say the least, made a burden because of pain.

This problem of pain, so frequently glossed over or forgotten, is a very real one; and because there is a widespread belief among the public that surgeons are "too fond of the knife" there is a great deal of hesitation in seeking aid. Too often after assuring the patient that some simple form of non-surgical treatment will give relief one hears the sigh, "I wish I had known that twenty years ago!" For twenty years afraid to seek help! What this aid could have amounted to is revealed by a consideration of some common foot ailments and their treatment without recourse to surgery.

No better idea of the prevalence and ratio of some of these conditions can be obtained than by analysing the figures for the orthopaedic clinics of two foot hospitals. In these two institutions every patient who requires advice or treatment for conditions that are not simple or straightforward chiropody is referred to the orthopaedic surgeon for advice. In two years these cases amounted to 1,000. In the following table the figures in the column "Cases" refer to the number of times such a condition has been seen. As the patient may have more than one condition the number of "cases" does not correspond to the number of patients. In fact, the average is 1.35 lesions or conditions per patient.

Table Showing Analysis of 1,004 Patients seen from April, 1936, to March, 1938

	Cases	%
Metatarsal arch abnormalities (flattening, pain, etc.)	254	24
Hallux valgus complex (see below for description)	203	20
"Flat-foot" (acquired only)	194	20
Hallux rigidus	108	10
Hammer-toe	40	4
Unusual, severe, or persistent corns and ingrowing toe-nails, etc.	550	—

These figures convey some idea of the extraordinary number of patients seeking relief from chiropodists for foot complaints which have always been regarded as orthopaedic conditions. There is a reason for this. Later in the paper palliative methods of treatment are described, and the reasons why they are used are given under the heading "Contraindications to Operation" as well as in

* This paper is an expansion and adaptation of a lecture, illustrated by sketches and a cine-film, given to the Lancashire and Cheshire Branch of the B.M.A. at Salford Royal Hospital on February 23, 1938.

the paragraphs dealing with the methods. All the measures described are commonly used by chiropodists to a far greater extent than by surgeons (unless the orthopaedic department is fortunate enough to have a chiropodist attached), so that the nervous patients, fearing surgery yet craving relief, have gone to those from whom non-surgical treatment could be obtained.

The Hallux Valgus Complex

By far the most common of the afflictions that beset the feet of the twentieth century Briton is an abnormality of the metatarsal region. Excluding the figures for metatarsal arch defects, which include all cases in which the metatarsal arch is flattened, irrespective of symptomatology, the most common ailment is the hallux valgus complex. Although much has been written in recent years of the operative treatment of this condition, little has been said regarding the many factors of which it is an aggregation and which suggest the name hallux valgus complex.

Examination of some 300 cases has shown that the various parts of the foot are affected approximately in the following order of frequency and include the following conditions (Fig. 1):

(1) Flattening of the metatarsal arch with spreading of the metatarsals and the formation of

(2) callosities on the plantar aspect;

(3) valgus deformity and inward rotation of the hallux;

(4) formation of a bunion over an exostosis on the inner side of the first metatarsal.

(5) The second toe lies either under or over, or is pushed laterally by the hallux. If the former it is generally a hammer-toe and has a painful corn on the dorsum of the proximal interphalangeal joint.

(6) The outer three toes are usually crowded together, the fifth tucked under the fourth, the fourth under the third, and the third under the second. In other cases they are "clawed" and more or less rigid. The worse the metatarsal arch reversal—that is, the arch reversed from a concavity downwards to a convexity—the more likely will there be clawing of the toes.

(7) Dislocation of the second metatarso-phalangeal joint is surprisingly common when looked for. In my experience not less than 8 per cent. are so affected. Sometimes the dislocation is of the third metatarso-phalangeal joint, and I have seen it affecting the fourth, while two joints may be concerned.

(8) A genuine flattening of the longitudinal arch with both foot and calf symptoms may be found.

(9) Corn formation on the dorsum of the fifth toe and at the tips of the second and third toes is frequent.

(10) Affections of the nail of the great toe are common. Pressure of the second toe on the nail sulcus causes ingrowing toe-nail. Interference with the nail bed gives rise to onychogryphosis, onychatrophia, and the like.

(11) Swelling of the foot from oedema, not due to general conditions, is occasionally met with.

Any or all of these conditions may be bilateral or unilateral. This picture is not an exaggeration in any way. It is not surprising that the patient complains of pain in several sites. In fact every single factor of the deformity may give rise to pain or tenderness. I say tenderness because so often it is pressure when walking which causes the pain: while at rest there is comparative comfort.

Possible Modes of Production

One could argue about the cause of all these troubles for years without being able to give conclusive support to any contention. A few facts clear the ground a little. My figures show that the number of males affected is only one to every fifteen women. It is usual to find on inquiry that the males whose feet are really deformed have suffered from a general or local "infective" disease such as rheumatic fever, generalized arthritis, gonorrhoea, or frost-bite. Clinical examination shows that metatarsal flattening and "spread" and callosity formation are most common, that slight hallux valgus and a small exostosis

come next, and that the whole gamut of deformities is present only in the fully developed condition.

There is one other factor to consider, and this in my opinion is the key to the whole problem. Women wear "high-heeled" shoes which slope down from the heel to the base of the toes (Fig. 2a). This, as can be demonstrated by radiographs, means that the metatarsals are more or less vertical and that the body weight is thrown forward on to the metatarsal arch. This throwing or sliding forward at each step causes (1) rubbing of the plantar skin on the sole of the shoe at point $\times$ in Fig. 2a, and almost certainly accounts for the thickened skin; (2) distorts the transverse or metatarsal arch; (3) crowds the toes into the front of the shoe; (4) dorsiflexes the toes at the metatarso-phalangeal joints and leads to secondary contracture of the long and short extensor

This hypothesis takes no notice of heel height. It cannot be gainsaid that since our maidens start wearing pointed shoes at a very tender age this is a not unreasonable theory. It is undoubtedly the explanation for the crowding together and overlapping of the outer toes. But I cannot help remembering the cases one sees in males, where pointed shoes have not been worn and where there is the other factor—generalized infection. Anyone who has seen a pair of feet swollen and distorted with gonorrhoea or acute rheumatic fever must be struck by the fact that all the tissues are oedematous and softened. The effect on the small muscles and the ligaments is only too easy to visualize. And we know, too, how these feet become deformed, almost as we watch them, even though the patient is wearing no shoes.

FIG. 1.—Tracing of a radiograph of hallux valgus complex (see text).

muscles, with stretching of the small foot muscles, the interossei, and lumbricals.

If the heel part of the shoe were horizontal instead of sloping (Fig. 2b) the sliding might be reduced, though it can never be abolished with heels higher than about one inch. Added to the heel height and slope we have the fact that there is insufficient heel and instep grip in most shoes and none at all in court shoes—that is, shoes with no fastening across the instep. A strap across the instep is effective only with moderate or low heels. With high heels it presses too hard and causes pain. The inefficient grip of the mid- and hind-foot necessitates the toes being used in a manner that Nature never intended, in order to prevent the shoe falling off. This upsets the normal muscle balance and is the cause of the flexion contractures at the interphalangeal joints—the gripping effect necessary.

The effect of sloping and high heels is therefore to change the posture of the foot, to pitch the body weight on to the metatarsal heads and the transverse arch, and to cause spreading of the arch. Inevitably the toes are dorsiflexed at the metatarso-phalangeal joints, and in order to grip the shoe become flexed at the interphalangeal joints (Fig. 3).

To account for the lateral deviation—the valgus deformity—of the hallux is perfectly simple, though there are two chief schools of thought. The first says that short tight hose and/or shoes are the deforming factor.

FIG. 3.—Tracing of a radiograph of a foot in a high-heeled shoe, showing the vertical position of the metatarsals.

FIG. 5.—Tracing of a radiograph of a foot in a shoe, showing that pointed shoes prevent the great toe being kept straight and that the point of the shoe is lateral to the mid-line of the foot.

Whereas before the attack they were reasonably or perfectly shaped, by the time it is over, some very few weeks later, there is spreading of the metatarsal arch, hallux valgus, and clawed toes as severe as one can ever see.

By analogy I have been forced to believe that in women the wearing of high heels and the abnormal posture of the feet cause vascular and mechanical disturbances which, by affecting the small muscles and ligaments, allow the metatarsals to spread or "fan out." This spreading separates the attachments of the adductor transversus and the adductor obliquus hallucis. The outer attachments are to bone, and are therefore "fixed." The inner attachments are virtually to the base of the phalanx of the great toe, and as the phalanx is connected to the foot by a joint any pull on the bone will move the joint and move the toe into the known valgus position. An argument supporting this is that as the muscles are attached to the plantar aspect of the phalanges one would expect them to cause rotation around the long axis of the toe as well as lateral deviation. We would expect the rotation to be so that the toe is twisted inwards till the nail looks towards the opposite foot. The rotation is found (Fig. 4).

Briefly, then, it can be asserted that the hallux valgus complex is caused by (1) an "infective" process affecting the feet, or (2) the wearing of unsuitable shoes. The

former cause is less common, but is the more frequent one in males.

That the valgus deformity is assisted by narrow-pointed shoes cannot be doubted. The point of a very large proportion of feminine shoes is outside (lateral to) the centre line of the second metatarsal and toe, and it is impossible to fit a foot with a normally positioned great toe into these shoes. All these points are easily demonstrated by radiographs. Tracings of radiographs are much more easily understood, therefore some are presented here instead of the original films (Fig. 5).

The explanation of the dislocated metatarso-phalangeal joint(s) is easy. It is caused by the pull of the tight extensor tendons on toes which are kept dorsiflexed because of the high heels. The proof is simple, and depends on clinical facts, anatomical and operative dissection, and experimental stimulation of muscles at operation.

Surgical Treatment

The surgical treatment of hallux valgus deformity has been argued and discussed for at least two generations. In one group of operations an attempt is made to correct the fanning of the metatarsals as well as to correct the great toe. So far as I know these operations have not gained any wide popularity, because, although they look well on paper, their execution is not easy nor is their effect that which might be hoped for.

The popular operations take the form of making a false joint for the great toe by excision of (1) the base of the phalanx or (2) the head of the metatarsal. I will refer you to some correspondence in the *Journal* (1935, 1, 446, 504) for opinions on the relative merits of these operations. After months of facts and figures no side won. The truth is that in many cases any reasonable operation will cure the valgus deformity of the hallux; but, as Sir Robert Jones pointed out many years ago, there is small satisfaction for patient or surgeon if the more shapely foot is still painful, and he emphasized, what most of us know, that the foot (as a whole) must be considered as a whole. In so many cases the patient complains of pain only at the base of the second toe. The enthusiastic surgeon who corrects the deformed great toe and neglects the cause of pain in the second toe has performed a good operation, but has not

necessarily performed one to cure the complaint which made the patient consult him.

If the patient's complaint is referable to the second toe and there is a dislocation here, one must either excise the base of the phalanx of the second toe or tenotomize the extensor tendons. If the pain is due to compression of the second toe between the first and third toes, and there are no other complaints, it may be wiser to amputate the toe. It has been argued that this will allow the great toe to deform further. I doubt it. But it does allow the vain lady to go on wearing pointed shoes—no small psychological point.

The trouble may be the painful corn on the hammer-toe. There may be corns on other toes. These corns may be due to the tight extensor tendons, which press the toes up against the shoe. In such cases tenotomy of the extensor tendons must be performed, or the tendons may be transplanted to the metatarsals, in order to aid re-formation of the metatarsal arch. One can go on almost for ever describing the many things which may need doing, and one or more of which will have to be done in many cases, but as this is a matter for the surgeon I will not take up any further space here.

Contraindications to Operation

What of those who refuse operation or on whom operation cannot be performed? The former are a very large group. The medical contraindications to operation are exceedingly few. If it were necessary to use a general or spinal anaesthetic one might hesitate to suggest operating on a lady of 70 whose cardiovascular system was poor. But if she

is suffering constant pain as a result of a foot condition which can be relieved one has to ask oneself whether it is not true that relief of the pain would improve her general condition. Seeing that it is perfectly easy to perform almost any operation under local anaesthesia, the operative risk itself is negligible. I refuse, however, as a result of experience, to transplant tendons under local anaesthesia. It is not wise to operate on a case where there has been recent rheumatic fever or gonorrhoea, because of the risk of lighting up the inflammation. Severe cases of diabetes, arteriosclerosis or other vascular disturbances, and advanced nephritis or

FIG. 2a.—"High-heeled" shoe, showing sloping heel.

FIG. 2b.—Similar shoe with level heel.

FIG. 4.—Showing rotation of hallux in a case of valgus deformity.

FIG. 6.—Metatarsal dome or pad.

FIG. 7.—Metatarsal rocker bar, showing range of movement permitted without movement of great toe.

FIG. 8.—Protective bunion pad.

FIG. 9a.—Dorsal toe prop.

FIG. 9b.—Single dorsal toe padding.

FIG. 10.—Example of instructions sent to a shoemaker in case of flat-foot.

cardiac disease or varicose veins with oedema of the feet make one pause, because a poor circulation in the foot always implies the risk of sepsis or poor healing of the wound; but each case must be considered on its merits. The final contraindication is when the patient refuses to wear reasonable footwear after the operation: the corrected foot will not fit pointed shoes, and if the foot is forced into them soon after operation the deformity will recur.

A much more important group of patients includes those who cannot afford the time for operation and after-treatment. I warn all my patients that they must expect to be away from work for not less than six weeks. In some cases nearly three months is required. It is not that the patient is laid up for long—most patients can start walking in three weeks—but when we remember that the feet do more work and support more weight than any other part of the body it is not surprising that in the elderly it takes two months to restore them to their original agility and power. There is always this consoling fact when deciding whether the time can be afforded: that whereas before the treatment the patient was a cripple, afterwards he or she will rediscover the joy of painless movement.

Palliative Treatment

But to those for whom operation is an impossibility we can offer palliative measures that are worth while. They may involve a little trouble and some attention to details, but those of us who have prescribed them know how grateful the patients are for the *relief of the pain*. These measures apply to all foot conditions—not only hallux valgus complex. They can be divided into:

- (1) Alterations to shoes or the prescription of special types.
- (2) The fitting of protective pads.
- (3) The application of corrective strapping.
- (4) Attention to corns, callosities, etc.
- (5) Physiotherapy—that is, heat in various forms, massage, exercises.

The whole of this issue of the *Journal* could be filled on these subjects alone, so I will confine the account to examples of what can be done and the reasons behind the suggested treatment.

ALTERATIONS TO SHOES

I have seen a number of cases of hallux valgus complex where the patient's whole life was overshadowed by her foot troubles. Shoes were ordered from ordinary shoemakers—not surgical shoemakers. We sent a draft or outline of the foot together with measurements taken with an ordinary domestic tape-measure, and asked for modified straight-inner-sided shoes with one-inch heels, plenty of toe room, etc. These shoemakers supply good-looking, comfortable shoes in a short time and at a reasonable price. In some cases my patients, who decided to have these shoes until such a date as they could take time off for the operation, were so relieved by wearing them that the operation never was performed.

Simpler measures include the fitting of a rubber "metatarsal dome" into the shoe (Fig. 6). This is a most useful little support. It distributes the weight of the fore-foot, and the callosities and pain due to localized pressure in this region are greatly relieved. An alternative support of great value is made by cutting and shaping 7/16-inch semi-compressed adhesive felt, which adheres to the foot.

In the case of hallux rigidus where there is pain because the metatarso-phalangeal joint *cannot* be moved or *when* it is moved, the fitting of a metatarsal rocker bar makes it possible to walk without any movement here. I have patients whose radiographs showed very marked osteo-arthritis, but who have been freed from all pain by this fitting, which costs 1s. 6d. Fig. 7 illustrates the principle well.

PROTECTIVE PADS

Bunions, corns, callosities, and all tender areas can often be relieved by the fitting of a well-shaped pad. I knew

of these measures as a medical student, but it was a chiropodist who taught me the secret of success. I used the same material as he did—adhesive felt. But whereas I only cut out what I thought was a good shape, he carefully makes his pad to shape from a metal template and then skives or bevels it so that it fits without any abrupt edges (Fig. 8). Similar kinds of pads can be used for the toes. The type illustrated in Fig. 9a fitted on to the dorsum of clawed toes and overlying the metatarso-phalangeal joints, with a smaller one underneath the toes, will provide an extraordinary degree of comfort. The smaller type (Fig. 9b) on one toe—for example, hammer-toe—will protect and relieve painful corns. It will be obvious that the limit to the use and design of pads is that of the ingenuity and skill of the doctor or chiropodist. The important point is to skive or bevel the edges. To make and apply them consumes more time and patience than the busy surgeon or doctor may possess. And one must express the opinion that here is a case where we might very profitably utilize the skill and time of the chiropodist, who spends his life working with such material.

CORRECTIVE STRAPPING

The uses of this method of treatment are somewhat limited, but of value in the young. No other treatment is required for deformed toes in early childhood. In hallux valgus one can sometimes prevent pressure of the great toe against the second by employing it, but unless the patient has a particularly good pair of shoes the benefit of the strapping is lost.

CORNS AND CALLOSITIES

Callosities form most commonly under the heads of the metatarsals: in metatarsal arch flattening and in hallux valgus usually under the second, third, and fourth metatarsals; in pes cavus most commonly under the first and fifth. They can be exquisitely tender. Protection by adhesive strapping or a metatarsal dome alone is of a little value. The best treatment is to remove the thickened skin. A special form of scalpel—a spade scalpel—which cuts at the end of a broad blade is a very easy instrument to use and is a favourite of the chiropodist. After removal some means of preventing rapid return must be devised. The metatarsal dome or pad such as that described is one measure. A special insole shaped and hollowed is even better, and for this a good surgical shoemaker's aid must be sought. Ideally one should order shoes made on a last which has been built up to match a plaster cast of the foot. This ensures—provided the surgeon insists on it—that the inner surface of the sole is shaped to the foot: the exact opposite of trying to make the foot fit the shoe.

There are two common ways of treating corns. One is to prescribe a corn paint or plaster. These contain for the most part salicylic acid. They do help, but so often do infection of the corn and inflammation of the foot follow their misuse that I have no hesitation in condemning them. Far better to let the chiropodist use his skill in enucleating the corn "root and all." Corns, like callosities, are due to intermittent pressure of the shoes. When the shoes are unsuitable permanent cure is ensured by seeing that correctly shaped shoes are obtained.

PAIN, CORNS, AND FLAT FEET

Aside from the discomfort itself, corns, callosities, and other causes of pain play a much more important part in the production of foot disabilities than is commonly realized. Most of us have experienced this at some time or other, when, on a long walk or march, we developed a painful blister or rubbed toe, or simply made a hole in our socks. We soon became conscious that besides the pain there was a tired aching feeling in the foot and the calf. This ache is the symptom of muscle fatigue. Why should muscle fatigue arise because of a pain? Previously we walked with no trace of it.

The muscles of the legs have a postural tone or supporting action, which is under reflex control. Agonist

and antagonist groups of muscles influence each other, and in conjunction with stimuli from skin and joints a perfect balance of power is maintained. Sherrington and others have shown how easily this reflex balance could be affected; how the tone of one group of muscles could be altered by stimuli of many types and from many sites and organs. In particular, pain could inhibit the tone. If, for instance, the action of one muscle causes pain from pressure against a nail in the shoe, a blister, or a corn, then the tone of that muscle is reflexly inhibited and its power reduced. This upsets the delicate balance, and if we persist in trying to walk the muscles protest by aching and tiring. While there is no agreement as to whether the human foot should or should not possess an arch, or whether the muscles of the leg are the principal supports of the arch, common experience teaches us that the first symptoms of flat-foot are tiredness of the legs and aching in the calf. Furthermore, treatment directed to the relief and cure of muscle strain relieves the condition. For this reason one believes that the muscles are of supreme importance.

In the treatment of mobile flat feet and of muscle fatigue in the legs it is manifestly important first to make sure that there is no painful corn present. So often there is such a cause. After treating this, or if there is no such painful element in the case, the following measures are needed. First, the overstrained muscles must be relaxed and rested by providing a mechanical support. Wedge the inner side of the heel. The heel must be low enough and wide enough to allow of it. If high heels are wedged the stability of the whole foot is impaired and the condition made worse. Depending on the width of the heel, the wedge should be from three-sixteenths to one-third of an inch. The inner side of the heel should be elongated by about three-quarters of an inch to provide extra support under the astragalus and scaphoid (Fig. 10). In very severe cases rest in bed for a few days may be required. To restore the tone and power of the muscles massage, exercise, and electrical stimulation must be ordered. After a few treatments the patient may be permitted to continue to exercise at home without supervision.

PHYSIOTHERAPY

It is not possible to say very much here on this subject, but it must be mentioned. Radiant heat or infra-red rays relieve pain, help to loosen rigid joints, and assist recovery after operation. Massage influences the circulation and increases the blood supply, so improving local metabolism and aiding in the removal of fluids. The mechanical effect of massage and wrunchings also removes fluid, breaks down adhesions, and restores mobility. Exercises restore mobility to joints and increase the tone and power of muscles.

In minor foot conditions there is unlimited scope for the use of all these measures; but I will not enter into details now, except to say that many of us are apt to neglect them in the after-treatment of feet which have been operated on. There is not the slightest doubt in my mind that they are almost essential in the elderly; and in those cases where no operation is performed they play a most important part.

Shoes

The correspondence columns of the *Journal* have shown how little agreement there is on the question of what constitutes a good shoe. I hold definite views on the subject. That they are of value can be demonstrated to any who care to examine and question the patients for whom I have ordered what I consider correct footwear. It is very simple: (1) the shoe must grip the heel firmly; (2) there must be a bar or other tie which fits over and grips the instep; (3) the fore part (vamp) must conform to and be a little more anatomically correct than the foot and must allow enough room for the toes to move about; (4) the heels of the shoes worn out of doors or at work or play (and in the case of indoor occupation

those worn during the day) must not be higher than one to one and a half inches. So simple, yet so difficult to obtain; though in the last three years or so there has been a marked improvement in the models made by good shoe manufacturers.

A Problem

There are two theoretical objections to the palliative measures I have described. The first is that they are palliative only. But as we have seen, they frequently do restore the patient to comfort. The other is that so much of them is tedious to carry out and requires regular repetition. We have the trained masseur or masseuse to give physiotherapy; but in the past there has been no one to see to the paddings, strappings, corn-cuttings, etc. It may be for this reason that they have been neglected. The specialist cannot expect his private patients to pay his fees for regular visits. He has no time in a busy orthopaedic clinic. The general practitioner is far too busy, and in any case has no wish to acquire a reputation as a corn-cutter.

There are specialists in this branch of auxiliary medical work—the chiropodists. The public discovered them many years ago and are going to them in ever-increasing numbers for such treatment as I have mentioned. There were 45,000 attendances at two of Manchester's foot hospitals last year. Very few medical men and fewer hospitals have felt it wise to enlist their aid. We at Salford Royal Hospital have had the benefit of a chiropodist's help for over a year, and we appreciate to the full just what he can do. I would like to make a plea for some definite liaison between properly trained and approved chiropodists and the medical profession. There is so much that they can do. They are doing it in their own private practices and clinics. One wonders whether we are not missing an opportunity to render even better service to our patients by failing to utilize their skill in our hospitals and our own private practices.

Since the above was written a report has appeared from University College Hospital advocating the appointment of a chiropodist to all diabetic clinics. They state that since they appointed a chiropodist the incidence of gangrene among diabetics has fallen by 50 per cent. One wonders whether there is not a medico-legal aspect to be considered. The hospital which does not appoint a chiropodist may be guilty of negligence in not providing expert treatment to the best of its ability as laid down by several High Court judges.

G. C. Higoumenakis (*Ann. Derm. Syph.*, Paris, December, 1937) points out that in 1927 he recorded the case of a patient with congenital syphilis who had a swelling on the inner third of the right clavicle, and he showed at the same time a radiograph of the clavicles of another patient suffering from these two conditions. After investigating a large number of unselected dermatological cases and reviewing the literature on the subject, the author has become convinced that this sign is as important as any in the diagnosis of congenital syphilis, and that its frequency is as great as that of the better-known stigmata of the disease. It does not occur in those who are healthy or in persons suffering from acquired syphilis. He stresses the selection by the spirochaete of connective and lymphatic tissues, the presence of a secondary centre of ossification at the inner end of the clavicle, and the membranous origin of the clavicle. He considers that another factor in the production of this swelling is the repeated irritation of the sternal end of the clavicle at the sternoclavicular joint, as it is the clavicle which prevents the acromion from sliding towards the mid-line when the arm is being used. Although the condition most commonly affects the inner third of the right clavicle, he has thirteen cases of people who are left-handed, or who use the left hand a great deal, who have developed a swelling of the inner end of the left clavicle. X-ray examination and the pathological findings indicate that the condition is essentially a formation of new bone and not a periostitis.