The radical cure of corns and bunions / by E. Harding Freeland.

THE RADICAL CURE

OF

CORNS AND BUNIONS

BY

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PREFACE.

THE following pages, with sundry alterations and additions, originally appeared in the *Clinical Journal* for June 15, 1904. They form an amplified edition of an address on the same subject delivered to the Willesden Medical Society, on March 20, 1903, and subsequently published. The author hopes that the same cordial reception may be extended to this as was accorded to the previous edition.

E. HARDING FREELAND.

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Surgeon to St. George's and St. James's Dispensary; Surgical Registrar to the National Orthopædic Hospital.

Corns.

Definition.

The word "corn," when used in medical parlance, signifies a small localised epithelial swelling, appearing commonly on the foot or toe, running a chronic course, giving rise to considerable pain, and causing more or less serious disability.

General Remarks.

From a surgical standpoint, no doubt a corn may be looked upon as an affair of small moment, but from the point of view of the sufferer matters stand in a very different light; for, in addition to the pain and suffering to which these little tumours invariably give rise, they often render locomotion difficult and sometimes impossible, and at times

unfit the sufferer for performing his duties in life. Indeed, to fully appreciate the state of abject misery to which an individual may be reduced by a painful corn it is necessary to have experienced it in one's own person or observed it closely in others.

Under these circumstances it is difficult to understand why the treatment of this disease, which is as troublesome as it is common, should have been so neglected by *bona fide* practitioners of the healing art as to have fallen almost exclusively into the hands of irregular practitioners.

Case 1.—But this reminds me that I am indebted to one of the last-mentioned gentry for having unwittingly furnished me with the original case which first led me to take an interest in these things. It happened in this wise. Some four years ago a middle-aged lady hobbled into my consulting-room supported by a stout stick. This state of disability she attributed to a corn on the little toe of the left foot, which had tormented her, on and off, for the past ten years. To obtain relief she had worn specially constructed shoes, and had undergone no end of treatment at the hands of chiropodists, but in spite of all this the corn had continued to increase in size and the pain in intensity. Despairing of relief, she had almost made up her mind to make the best of her trouble, when she was induced to consult yet another chiropodist, whose skill had been very highly lauded. This gentleman, on seeing

the corn, refused to touch it, giving as his reason that it was a case for a surgeon. And so it came to pass that the patient fell into my hands. On examination there was a corn of huge dimensions—measuring seven-eighths of an inch in diameter—on the outer side of the left little toe, looking and feeling for all the world like a wad of old dry leather. The slightest touch caused excruciating pain, radiating from the toe along the outer border of the foot and shooting up the back of the leg. The patient could not put the foot to the ground without intense suffering; she could not wear an ordinary boot; and, as previously stated, could only walk with extreme difficulty. Bearing in mind that she had had no end of treatment by ordinary methods, it seemed to me that free excision was the only move which held out any prospect of success, and this was advised. The patient readily assented, and the growth was removed the same afternoon. To make a long story short, the relief from pain was immediate; the wound, which, on account of the size of the growth, had to be left to close by granulation, was healed in ten days, and at the end of a fortnight the patient was enabled to walk a distance of a mile in perfect comfort, wearing ordinary boots—a thing which she had not been able to do for years. I still see the patient occasionally, and can vouch for the permanency of the cure.

The appearance of the corn after removal, coupled

with the happy result of the operation, was sufficiently striking to lead me to investigate still further the life-history of these little growths. As a result I am led to believe that their true nature and the possibility of readily effecting their permanent cure is not sufficiently appreciated. And small wonder, for when I first began my investigation I naturally cast about for the experience of others, but found the information I could gain meagre in the extreme and useless for practical purposes. It may not be out of place, then, if I briefly describe the salient features of these growths as I have seen them, and deduce therefrom, as a corollary, a method of treatment whereby a permanent cure may be readily effected.

Varieties.

From time immemorial corns have been divided into two varieties — the "hard" and the "soft.' This, in reality, is a distinction without a difference, for structurally they are identical (*cf.* fig. 1 with figs. 2 and 3, &c.) All corns, in fact, are hard, and the difference is one of superficial appearance only, due to position, the so-called "soft" corns presenting a sodden, macerated appearance on the surface, owing to the pent-up heat and moisture between the toes, where they commonly exist.

General Appearance.

The superficial appearance of a corn needs no special description here; the horny consistence, the central cup-like depression, the circumferential, raised, rolled edge, the dirty yellow colour, and, in the case of the soft variety, the sodden white appearance, must be familiar to even the most casual observer. When, however, one of these growths is completely severed from its surroundings and carefully examined, it at once becomes apparent

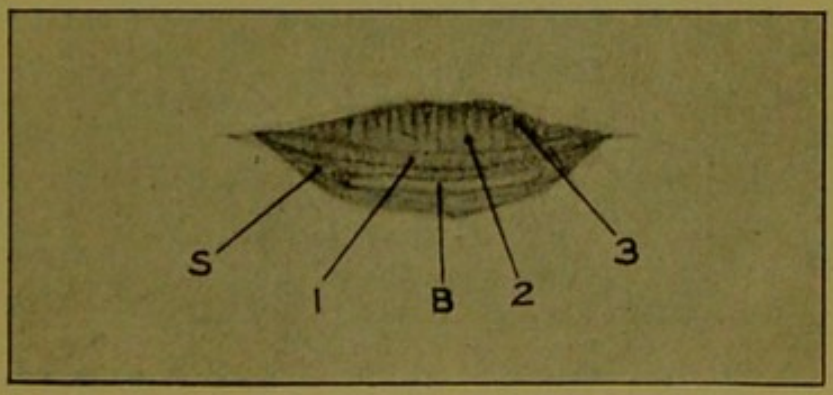

FIG. 1.—VERTICAL MEDIAN SECTION OF A "SOFT" CORN.
× 2.
1, Stratum mucosum; 2, stratum lucidum; 3, stratum corneum; B, bursa; S, subcutaneous tissue.

that the part which is visible on the surface constitutes only a portion—a minor portion, in fact—of the diseased tissue, the bulk of which lies beneath the surface (see figs. 1—7).

Shape.

Corns are usually described as being conical in shape, the apex being directed deeply towards the

true skin, while the base projects on the surface. This description, like many others which have crystallised through long ages without verification, is only partially true, and by no means holds good for all, or even the majority of cases. The fact of the matter is that corns vary much in shape, which is determined, to a large extent, by their degree of maturity and situation. In the initial

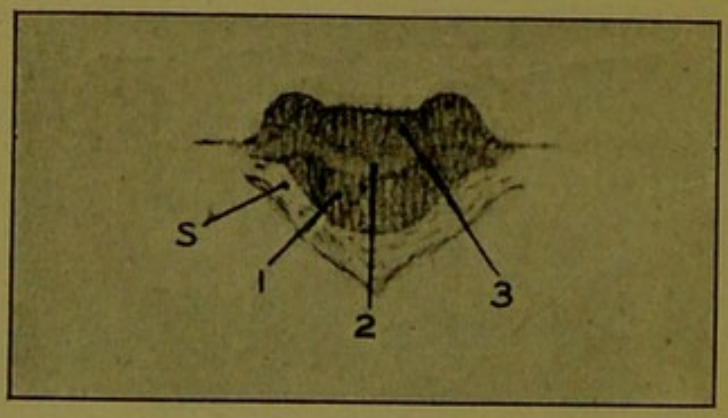

FIG. 2.—VERTICAL MEDIAN SECTION OF A GROWING CORN.
× 2.
1, Stratum mucosum; 2, stratum lucidum; 3, stratum corneum; S, subcutaneous tissue.

phases of its development a corn assumes the form of a stunted cone, of which the apex projects on the surface and the base, presenting a slightly convex outline, rests on the surface of the true skin (fig. 1). In corns of the ordinary type—the so-called hard variety—the condition of affairs just described soon becomes altered and, indeed, entirely reversed. Still preserving the conical shape, the base, which

becomes more or less concave, presents on the surface; while the apex, considerably blunted, projects deeply towards the surface of the true skin (fig. 2). The corn seems to penetrate and become embedded in the subcutaneous tissue, carrying the dermis before it. Corns, when met with in this stage of their development, have been somewhat fantastically likened to nails driven into a board.

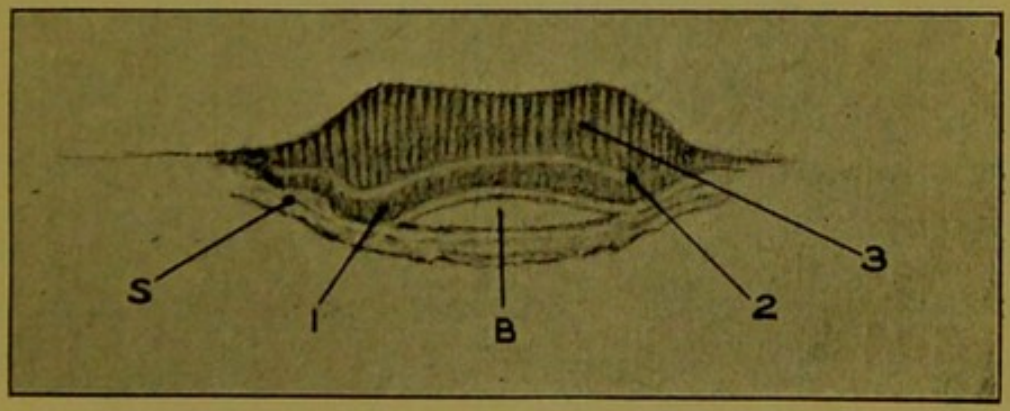

FIG. 3.—VERTICAL MEDIAN SECTION OF A MATURE CORN.
× 2.

1, Stratum mucosum; 2, stratum lucidum; 3, stratum corneum; B, bursa; S, subcutaneous tissue.

Hence the terms "clavus" and "clou," which have been applied to them. As development goes on yet another change in shape takes place. All old corns tend to assume a discoid shape, and, when associated with a bursa beneath, tend to become compressed vertically and biconcave (fig. 3). These variations in shape are no doubt due to the effects of external pressure; the growths, while

tending to increase superficially by the addition of new material from beneath, being forced to expand in the direction of least resistance—that is to say, deeply and circumferentially. The so-called "soft" variety, however, retains its primitive shape to the end, the superficial cells being shed almost as quickly as they are formed.

Naked-eye Anatomy.

The naked-eye anatomy of a corn is interesting, and can be well studied by examining a series of sections cut vertically through the centre of the growth. The surface so produced usually presents a smooth, glistening appearance, not unlike cartilage, but sometimes appears fibrous and asbestos-like. The cut surface is seen to be marked by numerous parallel vertical striations, which traverse the corn from top to bottom. In the majority of cases, also, three horizontal layers, varying in colour and degree of opacity, can be clearly made out traversing the entire substance of the corn (see figs. 1—7). Thin sections mounted in glycerine on a glass slide show the vertical and horizontal markings very well, and the details of their structure can be more distinctly demonstrated by examining stained sections under a low power of the microscope (figs. 4 and 5).

Microscopic Appearance.

On microscopic examination it is at once seen that all the layers of the epidermis share in the hypertrophy to a variable degree, the increase being most marked in the stratum corneum and

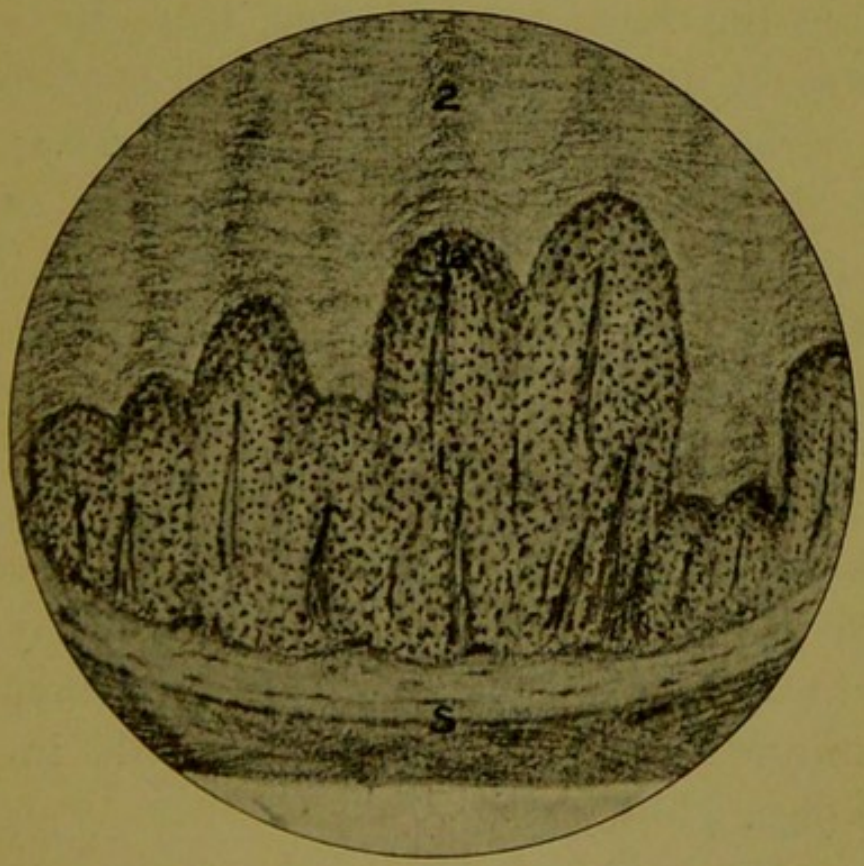

FIG. 4.—BASE OF VERTICAL MEDIAN SECTION OF A GROWING CORN.

Low power.

1, Stratum mucosum; 1a, stratum granulosum; 2, stratum lucidum; S, subcutaneous tissue.

stratum mucosum—that is to say, in the most superficial and deepest layers. The former is often increased to an extreme degree, so that in old corns it is often many times thicker than the whole

substance of the skin (fig. 5). The latter is markedly thickened in rapidly growing corns (fig. 4), but only moderately so in mature corns (fig. 5).

It is further seen that the pale horizontal line of variable thickness traversing the corn in a sinuous manner longitudinally, corresponds to the stratum lucidum, the layer deeper than this representing the stratum mucosum, and the layer superficial to it the stratum corneum (figs. 1, 2, 3, &c.); while the vertical striations represent columns of cells pressing gradually towards the surface (*cf.* figs. 3 and 5).

Certain changes, chiefly of an atrophic nature, are also observed in the true skin. The papillæ are compressed and elongated when active growth is going on (fig. 4), squat and stunted where full growth has been obtained. The deeper layers of the skin and subcutaneous tissue are compressed and thinned, but contain blood-vessels in abundance (figs. 4 and 5).

Mode of Growth.

The mode of growth of a corn is analogous to that of the normal epidermis. This latter, as is well known, is reproduced from the basal cells of the stratum mucosum, the newly formed cells pressing upward towards the surface to take the place of others which have been cast off. A corn

grows exactly in the same way, but the multiplication of cells is more rapid, and, as the cells increase at a greater rate than they are shed, they accumulate and consolidate into a compact mass at the site of the tumour.

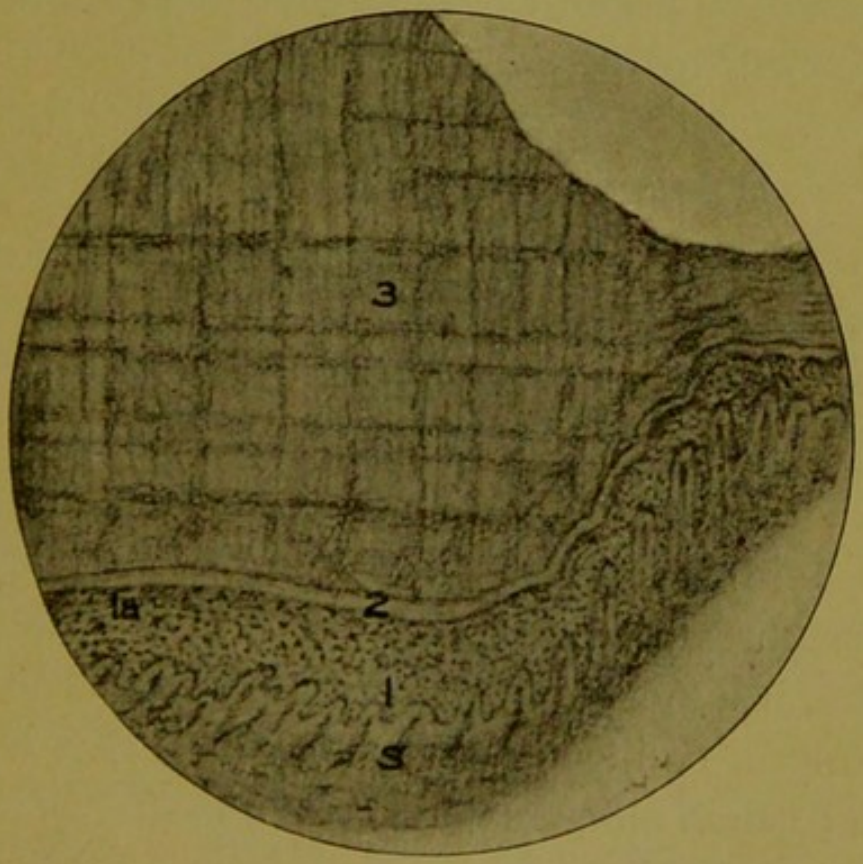

FIG. 5.—PERIPHERY OF VERTICAL MEDIAN SECTION OF A MATURE CORN.
Low power.

1, Stratum mucosum; 2, stratum lucidum; 3, stratum corneum; S, subcutaneous tissue.

Bursa.

Sometimes, and, I believe, always in the case of "soft" corns, a small fluid-containing sac, or bursa, forms in the subcutaneous tissue beneath the corn

(figs. 1 and 3). The function of this structure and the part which it plays in the life-history of a corn are points which are far too frequently overlooked. Originally defensive, acting as a buffer between the under surface of the corn and the underlying bone, it sometimes becomes aggressive and converted into a source of danger.

Inflammation and Suppuration.

One often hears a corn described as being "inflamed" or "suppurating." As a matter of fact, a corn never inflames or suppurates, but inflammation of the bursa frequently occurs, and sometimes runs on to suppuration. When it does the danger of the inflammatory process spreading to the surrounding structures, be it skin, subcutaneons tissue, joint, or bone, is a factor to be reckoned with. Indeed, it is mainly in connection with the bursa that complications, which alone make a corn a matter of serious import, are liable to arise.

And here I might remark, in passing, that the amateur surgery of corns, so frequently practised without due regard to elementary surgical principles, is more often than not responsible for these accidents ; and that the use of septic instruments by septic fingers on a septic skin is, in many cases, the prime cause of the attendant inflammation, and its sometimes serious consequences. Did not facts speak for themselves, it would seem superfluous to

state that it is just as imperative to observe strict antiseptic precautions when operating on corns, as under any other circumstances.

Case 2.—Some points in connection with the bursa are well exemplified in the following case. About eighteen months ago I was asked to see an elderly lady who was suffering from acute inflammation of the left foot. This she ascribed to a painful corn on the inner aspect of the left great toe-joint, which had been giving trouble for the past five years. After any undue exertion the corn became acutely painful, and the surrounding parts red and swollen. so that for the time being she was completely crippled. The patient told me that she had had many similar attacks on previous occasions, but none so severe as the present. Being naturally active and fond of walking, she found these disabling attacks very annoying, and was very anxious that something should be done to prevent their recurrence. When first seen the great toe and dorsum of the foot was acutely inflamed, and, but for the history, the condition might well have been mistaken for an attack of acute gout. To relieve this rest and hot fomentations were prescribed. Next day the pain was less acute, but seemed to have become centred in the region of the corn. On removing as much as possible of the horny layer of the corn, which had become thoroughly macerated, several drops of viscid serous fluid welled up from

the cavity, and the patient almost at once expressed herself as being relieved. The bursa had been accidentally opened, and with relief from tension came relief from pain. The inflammation rapidly subsided, and, in order to obviate any future attacks, excision of the corn and bursa was practised. The result is that the corn has ceased to trouble. There has been no attack for eighteen months, and the patient can walk a distance of six to eight miles in perfect comfort.

Treatment.

On investigating the question of treatment one is at once driven to the conclusion that the methods in general use, considered from the point of view of effecting a permanent cure, are unsatisfactory, for the simple reason that in the great majority of cases the growth recurs. This brings me to the point I wish especially to emphasise, namely, that if appropriate measures be adopted the most inveterate corns may be speedily and permanently cured with practically no risk of recurrence at all.

Foot-Gear.

As far as I can gather, the treatment most commonly advocated may be summed up in the three words, "Remove the cause," which, as-

suming the cause to be pressure and friction from wearing badly fitting boots, may be transposed so as to read, "Wear well-fitting foot-gear." Theoretically no doubt this advice is sound; practically it leaves much to be desired. In a certain number of cases it is true success follows this method of treatment; but in others it fails to give relief, and in spite of boots and shoes built on the most approved principles, the corns continue to give trouble.

I well remember two patients who were most particular with regard to their foot-gear. Each was in the habit of wearing boots of an approved type, carefully made and fitted. Through stress of circumstances each was compelled to wear ready-made boots of a different type for a time. The result was that each developed a painful corn. Notwithstanding the fact that in each case the type of boot previously worn was soon reverted to, the corn which had been started into activity by the badly fitting boot continued to grow and give trouble—a condition of affairs which, I may mention incidentally, was ultimately checked by excision.

Causation.

Cases such as these naturally suggest that pressure and friction are not the be-all and end-all of causation, and such no doubt is the case. As in

most other diseases, so with corns, the individual factor plays an important part. In other words, a predisposing or general cause acting from within must be recognised as well as an exciting or local cause acting from without. That this is so is shown by the fact that many whose feet are continually exposed to pressure and friction fail to develop corns; while others, under much more favourable circumstances, develop them without any apparent cause. What the nature of this innate proclivity is I do not know, but that it exists there can be no manner of doubt; and it is only on this hypothesis that one can satisfactorily explain the inveterate tendency that corns have to increase, notwithstanding the removal of the exciting cause.

While admitting, then, the importance of wearing well-fitting foot-gear as a preliminary method of treatment or as an accessory to other methods, the fact remains that it frequently fails to give permanent relief.

Methods of Treatment in General Use.

Other methods of treatment in general use aim at diminishing pressure by reducing the bulk of the growth. These are for the most part well known, and consist in the application of certain chemical substances and certain instrumental procedures. Here, again, one is forced to admit that,

while frequently successful in temporarily relieving pain, they more often than not fail to give permanent relief, for reasons which I shall endeavour to show.

In order to determine how much of the growth could be removed by chemical agents, I submitted several corns to prolonged soakage in a saturated spirituous solution of salicylic acid and other drugs

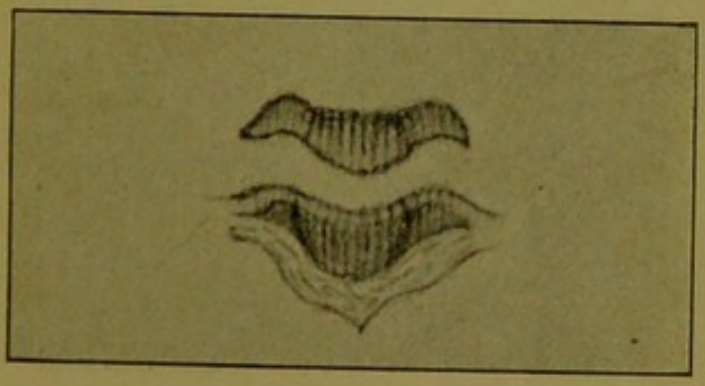

FIG. 6.—VERTICAL MEDIAN SECTION OF A CORN AFTER SOAKAGE IN SALICYLIC ACID SOLUTION, SHOWING SEPARATION OF THE HORNY LAYER.

× 2.

of a kindred nature, and found that separation invariably took place at the junction of the stratum corneum and stratum lucidum. In other words, the horny layer was exfoliated (fig. 6).

Again, in order to ascertain how much of the corn could be removed by the instrumental procedure usually practised by the chiropodist, I removed several corns piecemeal, and found that it was not possible to remove more than the horny layer without giving rise to considerable pain

(fig. 7). When separation of the horny layer is brought about by the method just mentioned, the deep surface of the part removed usually presents an irregular jagged appearance, which is often shown to the patient as a proof that the corn has been extracted "by the roots." Hence one frequently hears the statement made by patients that

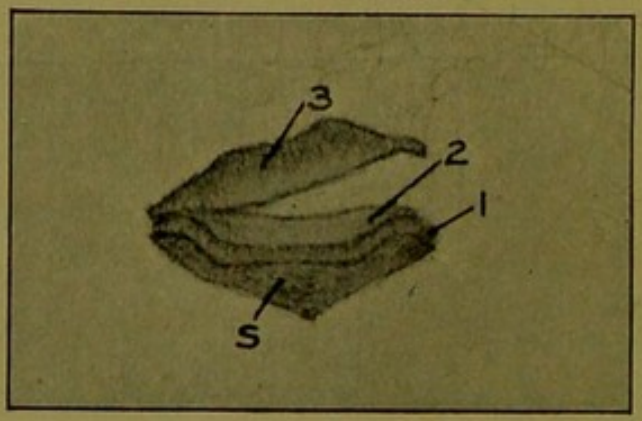

FIG. 7.—VERTICAL MEDIAN SECTION OF A CORN IN WHICH SEPARATION OF THE HORNY LAYER HAS BEEN EFFECTED BY INSTRUMENTAL MEANS.

× 2.

they or their friends have had their corns extracted by the roots. The true explanation, of course, is that the vertical columns of cells have been irregularly severed at the level of separation. As a matter of fact, a corn has no roots in the ordinarily accepted sense of the term, and so extraction by the roots is impossible; but if by root is understood the part from which it grows, well, that has been left behind.

The common defect, then, which is shared by all the methods of removal in general use, is that the removal is only partial. The part of the growth from which it is reproduced being left behind, a tendency to recurrence is inevitable. Hence the frequent failure of these methods to effect a permanent cure.

Excision.

It follows, therefore, that if a radical cure is to be effected the entire growth must be freely excised. I found that a certain amount of success followed this method, but that in a certain proportion of cases attacks of inflammation occurred on the site of the corn at intervals. The reason of this was that the bursa, which had been left behind, inflamed from time to time.

I therefore came to the conclusion that, if a permanent cure is to be effected, not only the entire corn, but also the underlying bursa must be removed. Since I have practised this method my results have been more uniformly successful, and many have been permanently relieved of an affliction which formerly was a constant source of worry and annoyance.

Since the above was written I am gratified to learn that in advocating the excision of corns in suitable cases I am supported by no less an authority than Mr. H. A. Reeves. Writing in the *British*

Medical Journal for March 21, 1903, in reference to a communication of mine to the same journal on the treatment of corns, he says, "I am glad Mr. Harding Freeland has called attention to this matter. . . . . His teaching as to the excision of the painful or inflamed corn and underlying and often inflamed bursa, is the only correct one if a radical cure be aimed at."

Method of Operating.

The operation of excision is naturally painful, unless means be taken to secure insensibility of the parts. Personally I prefer a general anæsthetic. Gas and oxygen answer the purpose admirably for a single corn, if the operator is fairly expeditious, and has the further advantage that it is perfectly safe and free from unpleasant after-effects. If, however, any objection be raised to a general anæsthetic, the operation may be done under a local anæsthesia quite well. The method which I usually adopt is as follows : 5 minims, more or less, of a 4 per cent. solution of eucaine are injected into the subcutaneous tissue beneath the corn and, having waited a few minutes, the superficial parts at the site of the incision are rendered insensitive by ethyl-chloride. Anæsthesia is now complete, and the operation may be at once commenced. The method of operating is as follows : Having

taken every precaution to render the parts aseptic, two semilunar incisions, meeting at their extremities, are made through the skin around the circumference of the growth, taking care that they penetrate well into the subcutaneous tissue. The parts included between these incisions and between the surface of the corn and the underlying bone are then dissected out. The oozing is usually pretty free, and it is sometimes necessary to torsion a small vessel, but the hæmorrhage is never severe. The edges of the wound are approximated by one or two sutures, an antiseptic dressing is applied, and the wound left to heal, primary union at the end of a week being the rule. The net result is the formation of a layer of scar tissue at the former site of the corn. It might be thought perhaps that the formation of a scar in an exposed position, where it was liable to be subjected to pressure and friction, would lead to untoward results, but such in practice is not the case.

Case 3.—The following well illustrates the course and termination of a typical case of moderate severity. The patient, a domestic servant, aged 25, had suffered for three years with a painful corn on the little toe. For the past year this had materially hampered her in her work on account of the pain, which for the past month had been so severe that she had had to give up work altogether. Examination revealed a corn about half an inch in diameter,

occupying the usual position on the outer aspect of the little toe of the left foot. It was very tender to the touch, the pain, as is so frequently the case, radiating along the outer border of the foot to the calf. Excision under local anæsthesia was practised by the method just described, the wound being approximated by two fishing-gut sutures. At the end of a week the wound was healed, and the sutures were removed. During the succeeding week she was able to get about, the pain having disappeared completely. At the end of a fortnight she was able to walk in comfort in ordinary boots, and expressed herself as able to return to her work, which she did. This patient was under observation for a year, during which time she remained well, at any rate as far as the corn was concerned.

Corns and Deformities.

Before leaving this part of my subject I should like to give one word of warning. Corns, as is well known, are frequently associated with some common deformities of the foot (bunion, hammer toe, some varieties of pes cavus, &c.), and when present in such cases must be regarded as the effect rather than the cause of the trouble. It goes, therefore, without saying that, under these circumstances, the treatment of the corns must be the treatment of the deformity which has called them into being.

Do not be in a hurry, then, to excise a corn, and never do so until you have made a careful examination of the foot, in order to determine whether there exists any deformity which may reasonably account for the presence of the corn.

Methods of Treatment Compared.

To sum up, the difference between the method of removal I have just been advocating and the methods in ordinary use is that in the former the entire corn including the bursa is removed; in the latter the horny layer of the epidermis alone is separated from the underlying parts of the growth. In the one case removal is complete, and recurrence practically obviated; in the other removal is only partial and recurrence more than likely.

Radical Cure without Operation.

Since the above was written the author has been perfecting a method of treatment which promises to effect a permanent cure in the great majority of cases without operation. Should this method of treatment stand the test of time, after a more extended trial, it must largely supersede the operative treatment recommended above, which must then be reserved for the most inveterate cases only.

Bunions.

Definition.

The term "bunion" is used to denote a painful swelling which frequently occurs over the inner aspect of the ball of the great toe, the nature of which varies with the period of its existence.

Development.

In the first phase of its existence a bunion consists of a partial dislocation outward of the great toe (hallux valgus), which renders the head of the metatarsal bone unduly prominent, but as a rule gives rise to no symptoms beyond the deformity.

As time goes on the exposed head of the metatarsal bone enlarges from irritative periostitis, and the patient begins to experience pain and discomfort in the region of the ball of the great toe, especially after exercise. The affection enters on its second phase.

As the case advances still further a bursa forms over the inner aspect of the bony boss. The pain then becomes more intense, and subject to exacerbations, owing to acute attacks of inflammation in the bursa, and possibly also in the neighbouring joint, with which the bursa frequently communicates. This may be described as the third phase, or phase of maturity (fig. 8).

Sometimes however, as if matters were not already bad enough, the condition develops still further, and a corn forms on the summit of the bursa. The condition of the patient is then miserable in the extreme, constant pain and permanent lameness being the result.

Clinical Course.

Usually commencing in childhood, the deformity, which may affect one or both feet, progresses slowly and insidiously, but rarely gives rise to serious trouble until adult age is reached. In the

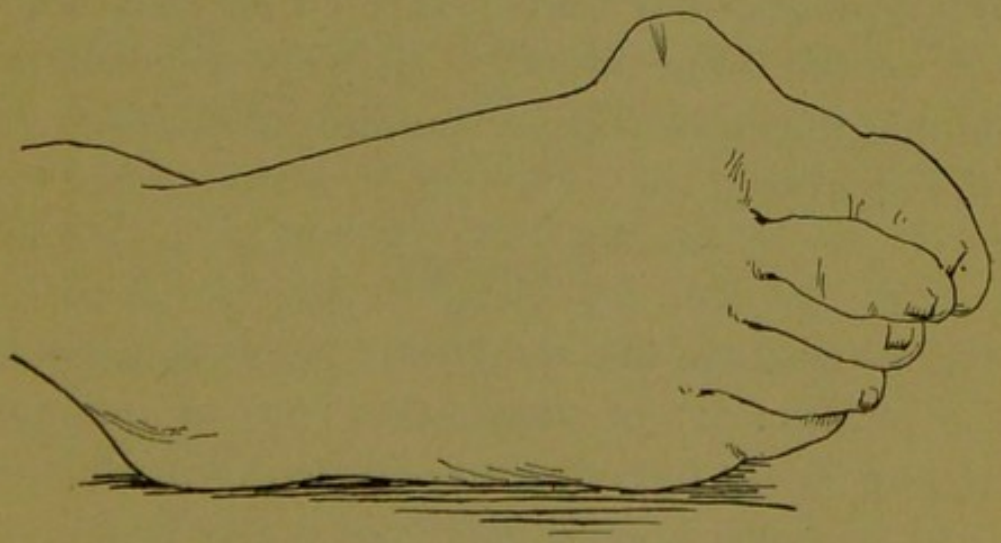

FIG. 8.—FOOT WITH BUNION.

great majority of cases the cause is purely mechanical, and may be traced to wearing ill-fitting boots, which are too narrow, and bunch up the toes.

By the pressure thus exerted the great toe is gradually forced outward, the head of the meta-

tarsal bone being rendered more prominent and more exposed to injury. Subsequently, as the result of friction exerted by the upper of the boot on the exposed head, subacute periostitis is liable to occur. Once set going, the inflammatory process tends to persist and become chronic, more especially in those of a gouty or rheumatic diathesis. This in turn leads to a progressive and permanent hypertrophy and enlargement of the head of the bone, which, as previously stated, is liable to become complicated with bursa and corn formation.

Although, for the sake of clearness, the inflammatory process has been described as affecting the head of the bone alone, it is almost needless to state that the joint and surrounding structures share in the changes.

Pathology.

Pathologically, the condition resolves itself into three phases : (1) of dislocation ; (2) of inflammation, and (3) of hypertrophy, occurring in the order named, but overlapping each other and progressing *pari passu* as time goes on.

Mechanical Treatment.

As in the early phases of the affection displacement of the great toe is the most striking change, it is not surprising that much attention should have

been directed to remedying this defect. Many ingenious devices—toe-posts, springs, levers, &c. —have been invented from time to time for straightening up the great toe and correcting the initial deformity. In incipient cases, and from an æsthetic point of view, when the patient can be found who is sufficiently persevering to wear them, these no doubt answer the purpose for which they are intended. But, unfortunately, the cases which are likely to be benefited by instrumental means rarely give rise to any trouble beyond the deformity, and either pass unnoticed, or, at any rate, seldom seek relief at the hands of the surgeon. As a matter of fact, relief is seldom sought until symptoms, in the shape of pain and lameness, due to the supervention of inflammatory changes have developed; when, even if the appliances could be tolerated they are of little use, for it is manifest that straightening the great toe will not check the inflammatory changes which are at the root of the evil.

Foot-Gear.

Many cases, if seen sufficiently early, may be relieved by wearing boots constructed on proper principles, and at the same time adopting appropriate measures for the relief of the inflammation.

As far as the relief of symptoms is concerned, the displacement of the great toe may be ignored,

but if an æsthetic effect be desired in addition, this can be produced by directing the patient to wear stockings with a separate stall for the great toe, which are often a source of great comfort, and to adopt daily exercises of an active and passive kind, which are calculated to correct the malposition of the great toe and to bring it to a straight line.

But many, especially women, in whom the deformity is more common than in men, cannot be induced to wear suitably constructed boots because they consider them unsightly. There are many cases, again, which fail to be relieved by boots, or get progressively worse in spite of them. In others, again, of long standing, the deformity has become so pronounced that to fit a boot which shall be at the same time shapely and useful is well-nigh impossible.

Operative Treatment.

What, then, can be done for the relief of these cases? Bearing in mind the fact that what the patient demands is relief from his suffering and restoration of his power of locomotion, let us revert for a moment to the question of cause. On what does the pain and lameness depend? Clearly not on the dislocation of the great toe, which is often displaced to an extreme degree without giving rise

to any symptoms at all. Symptoms, in fact, only arise when the head of the bone enlarges from inflammatory changes. This, then, I take it, is the keynote of the situation, for on this enlargement the formation of the bursa and corn when present directly depends. It is clear, therefore, that any method of treatment to be permanently successful must aim at getting rid of the boss of bone, which, by initiating and keeping going a vicious circle of conditions, must be considered the prime factor in the case. Obviously, then, if it does not interfere with locomotion, which in practice it does not, excision of the head of the metatarsal bone suggests itself as a rational and ideal operation. By this simple procedure the source of the mischief is removed once and for all; the joint cavity, so liable to become inflamed, is obliterated, the shaft of the metatarsal bone being joined to the base of the first phalanx by a band of fibrous tissue, giving a functionally active joint; and the dislocation of the great toe is at once restored.

Method of Operating.

The operation is performed as follows: A longitudinal incision is made over the inner aspect of the enlarged head, which is carefully separated from the surrounding soft parts. The shaft of the bone is then divided just beyond the head, which is freed

from its ligamentous attachments and removed. If the bursa is small it can be ignored; if, however, it be large and prominent and has a thick wall, it should be removed; while the corn, if present, should always be excised.

Case 4.—The result of the operation is well illustrated by the following typical case, from which figs. 8 and 9 were taken. On February 6, 1903, a young married lady consulted me for a painful swelling of the right great toe-joint. The affection had existed from childhood. She had it, she said, as long as she could remember, and attributed it to the fact that her mother had always insisted on her wearing boots which were too tight, with the idea of producing a shapely foot. It had given no trouble, however, till about two years ago, when she began to experience pain after walking, and was obliged to remove the boot to obtain relief. The pain gradually increased in severity and became more constant until, about a year ago, lameness began. This gradually increased *pari passu* with the pain, until now she could only walk with the greatest difficulty, and only with the aid of a stick. Being naturally active and fond of exercise—walking, cycling, and dancing—the patient was naturally much distressed at her disability, from which she was eager to obtain relief. On examination the great toe was dislocated outward to a considerable degree, so that it was overlapped by the second toe,

the head of the metatarsal bone was enormously enlarged and covered by a bursa of moderate size, the soft structures in the neighbourhood of the bony swelling, including the joint, were acutely inflamed, and an ulcer had formed on the most prominent part of the swelling (fig. 8). It was manifestly one of those cases to which it would be impossible to fit a useful and shapely boot, and excision of the head of the bone was advised. Attention was first

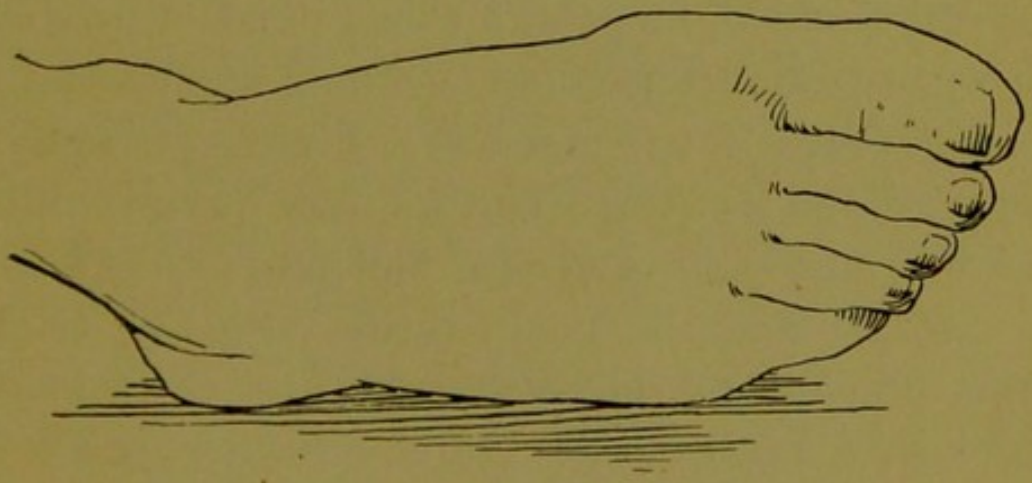

FIG. 9.—SAME FOOT AS FIG. 8, AFTER TREATMENT.

directed towards healing the ulcer and subduing the inflammation. When this had been accomplished, on February 27, the head of the metatarsal bone was excised through an horizontal incision over its inner surface, passing through the centre of the bursa, which was left untouched. The edges of the wound were brought together by three silkworm gut sutures and an antiseptic dressing applied, the great toe being straightened and held in position

by a pad of gauze placed between it and its neighbour. On March 6, a week after the operation, the wound was found to be healed. On March 13, a fortnight from the operation, the patient reported that she was able to get about without pain, and soon she was able to walk as usual. Fig. 9, which should be compared with fig. 8, shows the appearance of the foot at this period. The patient was seen on December 12, ten months after the operation. She then reported that there had been no recurrence of the pain, nor had the foot troubled her in any way. She could take long walks—having done as much as ten miles at a stretch—cycle, and dance as well as ever. The toe was quite straight, and the false joint was firm and mobile, as tested by the fact that she could easily raise the weight of the body on to the outstretched toes. Ordinary boots were being worn. If any further proof of the benefit conferred were wanting, it is furnished by the voluntary statement of the patient that if at any time the other toe got bad, she would at once have it treated in the same way.

Operations Compared.

Several other operations have been introduced for the relief of this condition, but none, as far as my experience goes, gives such uniformly good results as excision of the head of the first meta-

tarsal bone. The relief from pain, the restoration of movement, and the reduction of deformity are so strikingly complete that it may justly be described as curative. It has the further advantages that the patient is laid up for a minimum of time, and is enabled afterwards to wear ordinary boots with comfort.

Complications.

In recommending excision of the head of the first metatarsal bone for the cure of bunion, I have, of course, assumed that the symptoms could be definitely traced to the bunion, and were of such a nature as would justify operative interference. In uncomplicated cases this is, as a rule, not difficult to determine. But cases frequently occur which are complicated by other conditions, and require more careful consideration. In conclusion, I propose to refer very briefly to the most common of these complications.

Bunion and Hammer Toe.

Bunion is frequently associated with the condition known as hammer toe, a contraction deformity which most commonly affects the second digit. Such cases must always be carefully studied in order to determine how much of the pain and disability is due to the hammer toe and how much to the bunion. In the majority of these cases, no doubt,

it is the hammer toe that is primarily at fault, the diminished support afforded by the contracted second toe permitting the displacement of the great toe outwards. It follows, therefore, that the first thing to do is to correct the hammer toe deformity, and in many cases this will be all that is required. In other cases, again, where the bunion is manifestly giving trouble also, it will be necessary to treat this condition as well.

Bunion and Flat Foot.

Another deformity with which bunion is frequently associated, and of which it often forms an integral part, is flat foot. Here, again, we have to determine to what extent the symptoms may be ascribed to the flat foot, and to what extent to the bunion. In other words, we have to consider the all-important question as to whether the treatment of the flat foot alone is likely to bring permanent relief, or whether it will be necessary to treat the bunion as well.

These are questions which practical experience alone can decide.