degree of heat, indeed in some cases it has been cold, and the skin over it congested and blue. In many instances it becomes hot and tender after prolonged exercise, and there may even be slight inflammatory redness of the surface. Sometimes distinct grating has been felt between the articular surfaces. In many instances the articular margins are irregular, and expanded by "lipping" or by low-crowned nodular formations of new bone, such as are found in osteo-arthritis in older persons. Any attempt to move the joint freely causes pain.

In many instances the affection may be recognised at a glance by the appearance of the patient's boot. This, having been worn over a stiff toe whose joint is enlarged, is seen to be straight in the sole, bulged over the large joint, and from that point to its end smooth and unmarked by the wrinkling and creasing which would be produced by the natural movements of the toe within it.

The origin of the affection is obscure. A few of the patients have ascribed it to injury. In one instance it commenced after the toe had been accidentally driven against the edge of a stair as the boy was running upstairs without his boots; in another, after the toe had been contused by the fall of a heavy piece of wood upon it. In some the patients have been wearing boots that were too short; but, though this has been suggested as a cause, I am not convinced that it is so, for the toe of the opposite foot, though under the same disadvantage, very rarely suffers; nor have I either noticed any deflection of the toe such as usually occurs when the anterior part of the foot is cramped, or met with the affection in boys under 12. In some instances there has been a strong family history of rheumatism, or of osteo-arthritis; but in many this has been completely absent. I have followed some of the cases up for six or seven years. In some the affection has, as in Case II, persisted and led to marked and permanent anatomical changes closely corresponding with those of the common forms of osteo-arthritis. In many, after persisting, though with periods of subsidence alternating with exacerbations, for two or three years, it has slowly disappeared, leaving the toe only somewhat stiff and the joint a little enlarged.

The idea may appear fanciful—too fanciful, perhaps, to be discreetly put into print—but I have often thought that the condition is in some way connected with the development of puberty. The cases are so strikingly alike, so strictly, in my experience, limited to patients between the ages of 12 and 20, and so frequently unaccompanied by any other joint-affection, that they seem to constitute a specialised group depending on some common cause, and vague as the suggestion may be, this cause seems in some way associated with the change to which I have alluded. It is well known that morbid conditions of the joints are sometimes connected with functional activity of the generative organs. Dr. Ord has recorded instances in which female patients have, with each menstrual period, suffered attacks of osteo-arthritis, which have subsided when menstruation ceased; and at the present time I have a girl, aged 15, under my care with hip-disease, in whom the affection has, under prolonged rest, become very slight; but with each menstrual period she has a return of pain and lameness, simulating an ordinary relapse; and when menstruation is over the exacerbation of the joint-symptoms disappears. In cases in which there is a history of osteo-arthritis in the family, or in which an injury of the toe has occurred, these influences may probably be associated with the disturbance of the generative organs in producing the joint-affection. However, I know so little of the subject that I will not venture on any attempt to trace it further.

The treatment of these cases, like that of many forms of osteo-arthritis, is often, it must be allowed, unsatisfactory. Of course, the patient should be provided with well-fitting boots of soft leather, made with low heels, and of good length and width in front. He should have only moderate exercise. If, as is sometimes the case, there is a tendency to flat-foot, means should be taken to remedy this condition. Hot douching of the toe, night and morning, with salt-water, and the use of two or three small blisters, will sometimes be useful. In several cases, I have manipulated the toe under gas—in some with marked relief, while in others, though movement was produced at the time, no permanent good was done. In some instances in which the joint was hot and tender, I have applied a leather splint to maintain complete rest. In one case I kept the toe fixed in plaster-of-Paris for three months. Complete rest, however, has appeared to be of very slight benefit, and I do not think it should be long maintained. When other symptoms, or a family history of osteo-arthritis, are present, appropriate remedies for this condition should be employed. In one case I thought iodide of potassium was beneficial. Excision of the joint may be justifiable in some of the worst cases; but I have never resorted to it, nor have I seen a case in which it has been performed; neither have I any experience of amputation of the toe.

DEFORMITIES OF THE GREAT TOE.

By T. S. ELLIS, M.R.C.S., ETC.,

Consulting Surgeon (late Surgeon and Ophthalmic Surgeon) to the Gloucester Infirmary.

THREE varieties of deformity have during the past month been separately described in the JOURNAL, but all of them, as I believe, having a similar origin, and each of them depending for satisfactory treatment on a correct appreciation of the function as well as a due regard to the anatomy of the part involved.

It cannot be too strongly enforced that the principal function of the flexor muscles, paradox though it seem, is not to flex the great toe, but to press it during progression, be it in walking or in running, against the ground in all its length. Herein is manifest the advantages of having the phalanges in two rather than in three segments, as in the case of the other toes. The point of greatest pressure being at the point between the two phalanges, there is no uprising anywhere; whereas in the case of the smaller ones, the downward pressure being at the joint between the second and third phalanges, the backward traction causes a distinct uprising at the joint between the first and second. This result, however good for gripping the ground, could not give that firm, solid base from which the body may be propelled onwards, which it is the main purpose of the great toe (in man so greatly developed) to supply. This curious arrangement of two phalanges for the first and three for the other digits (common to all mammals) cannot be shown, so far as I am able to discover, to be or to have been of the slightest advantage to any inferior animal, recent or fossil, although it is, as I maintain, essential to the design of the human foot. I would add that in the case of the great toe, the up-lifting effect of the backward traction of the long flexor is also felt at the joint behind the one at its attachment; but this is not an inter-phalangeal, but the great metatarso-phalangeal joint. By this means effective provision is made for relieving that joint from the severe pressure which the weight of the body, coming directly on it when it occupies the position of the lower pier of an up-tilted arch, would otherwise occasion.

Another point of importance is that the flexor muscles are powerful abductors, drawing the great toe away from the middle line of the foot, towards which it tends when at rest, and bringing into a line with the inner margin, or even beyond, so as to form a slight concavity, the different directions being due to the form of the articular surfaces of the metatarso-phalangeal joint. This double effect of the flexors is impeded by eversion of the foot, and it must of course be prevented by fixing the great toe in a diverted position, as is done by the conventional median-pointed boot. In these boots the necessary abduction which the action of the flexor muscles should cause cannot take place, and drawing downwards against the sole of the boot is either impossible or is instinctively avoided on account of pain due to uneven pressure on the articular surfaces which action of the flexors would involve. This pressure cannot, however, be entirely avoided; thus irritation and finally, it may be, destructive disease, is set up in the joints. This the muscles, becoming in turn irritable, aggravate, and deformities ensue, varying in character according as the different forms of boot and modes of walking, or other cause, may influence them.

Once a bending at the inter-phalangeal joint established, the long flexor draws the second phalanx backwards, but the tip of it cannot turn downwards, as in ordinary flexion, that being prevented by the sole of the boot. This may produce flexion of the first, with (relative) extension of the second phalanx, a condition described to the Clinical Society by Mr. Davies-Colley and reported in the JOURNAL of April 2nd. It may be that the toe will remain straight and become stiff, as described by Mr. Lucy in the same number. It may even be that the second is drawn under the first phalanx, the distal end of the latter projecting upwards. In all these cases there will be evidence of much irritation having existed in both of the toe-joints. Far more commonly the great toe allows itself to be diverted with very little resentment as manifested in the joints, and becomes fixed in that position. For rectifying this common condition an apparatus is depicted and described in the JOURNAL of April 30th.

But while admitting the necessity in some cases for resections—which, however, are, at best, mutilations—and the utility of medicaments, local and general, as well as of apparatus, I submit that all those things have a tendency, as the discussion at the Clinical Society showed, to divert attention from the necessity of fully restoring the function of the part, which alone can bring about a satisfactory cure. This result, clearly, cannot be attained in any case without boots giving plenty of room for the great toe to come into straight line, but these being provided, disappointment is felt at the absence of

any disposition of that part, even when no structural change is apparent in it, to occupy the room provided. The sock may easily cause sufficient pressure to prevent this, and the best plan is to cut a hole in it, in that way setting perfectly free the great toe, which may be clothed with a few turns of bandage tied around. In time, socks may be substituted having a straight inner line, or, better still, a separate stall for the great toe. The invitation to occupy the space provided in the boot must also be kept open; the leather must not be allowed to fall in, but be frequently pressed upwards, and may, when the boot is not in use, be supported by wool stuffed within. Better still, of course, is the use of a well-made boot-tree. More generally the loss of the power of voluntary action of the flexor muscles is the explanation why the great toe shows no disposition to return to its proper place, and it is with difficulty that this power can be restored. The best way to practise the movement is with bare feet; the assistance of the eye in the attempt to do it is very great. In time the habit of walking with firm pressure of the great toe against the ground in every step becomes even automatic. Given sufficient patience and determination, and it is surprising how bad a condition may be removed, and perfect recovery of outline and of function attained by these means alone. Of course, all this holds good in less degree in proportion to the amount of structural change in the joints. It is important, I should add, that, in walking, the feet should be directed forwards, not everted when, as already stated, the action of the flexors is impeded.

The connection of the deformity described by Mr. Davies-Colley with flat-foot arose at the Clinical Society's meeting. I recognise with him that generally or frequently they are not found together. It is rather in cases where the long flexor muscle consents, so to speak, to entirely suspend its functions that the additional deformity occurs. In such cases the bowstring or tie-rod effect (as I have called it) of the long flexor is lost, and the arch sinks for want of the persistent bracing which vigorous action of that muscle affords.

STIFFNESS OF THE GREAT TOE IN ADOLESCENTS.

By J. M. COTTERILL, M.B., F.R.C.S.E.,
Assistant Surgeon, Edinburgh Royal Infirmary.

CONSIDERABLE doubt and difference of opinion have been expressed by various surgeons as to the precise pathology of this condition, which consists of an apparent flexion of the great toe, accompanied by stiffness, and frequently by pain, in its metatarso-phalangeal joint. There seems to be no mention of the subject in any standard work on surgery, but I do not consider it a rare condition; for instance, I have seen three cases during the last month.

Mr. Davies-Colley, in a paper read before the Clinical Society of London, is reported to have attributed it to one of two causes; either (1) injury to the joint followed by contraction, or (2) pressure of short rigid boots upon an abnormally long great toe. Rheumatism, gout, contractions of tendons and ligaments, are amongst other causes suggested by various authorities. Mr. Symonds says: "It occurs in young boys, especially those with flat feet. Some of the boys had a long great toe." The general consensus of opinion seems to have been strongly against the idea of flat foot being an important factor. Mr. Davies-Colley "did not think flat foot had much to do with it"; while another speaker stated that this deformity was unknown in barefooted races, though flat-foot was common with them.

I am convinced that most, if not all, typical cases are dependent upon a combination of flat foot (or a tendency to it) with rigid and short boots. Flat foot alone will not produce it; ill-fitting boots alone will not do so; it requires a combination of the two. A short boot might perhaps set up irritation in the joint, but will not cause the disarrangement of parts peculiar to this disorder. The process, then, I take to be as follows: The patient has a short, shallow, and rigid foot, which firmly grasps the toe, making it an absolutely fixed point. Given, then, the condition of flat foot, or even that of an undue laxity in the ligaments which should support the instep, the patient on walking causes depression of the proximal end of the first metatarsal bone. This necessarily alters the relations of the structures at the distal end of the bone; that is at the metatarso-phalangeal joint, as follows: (1) The articular cartilage of the metatarsal bone is uncovered on its dorsal aspect, as would happen in strong flexion of the toe (this I have verified on a good dissected specimen); (2) the dorsal portion of the capsular ligament is at the same time put severely on the stretch. These fibres do not at any time admit of great movement of the toe in flexion, and the pain referred to the part, and sub-inflammatory changes taking place in it are, I believe, amply explained by these two circumstances. I need not remind any practical

surgeon of the severe pain caused by the continued stretching of ligamentous structures.

In the early stages the only symptom is slight pain, referred to the dorsal aspect of the joint (as one would expect), and increased on movement. A little later one finds swelling of the soft parts, or of the bone itself, with redness and inflammation. This may go on to general involvement of the joint, with more or less complete fibrous ankylosis in the distorted position, and contractions of plantar ligaments and muscles. Not infrequently in old-standing cases there appears to be an atrophic condition of the parts concerned, rather than an increase in their size. It is now easily explained why barefooted races are exempt from this disorder: the element of the fixed toe is wanting. The apparently abnormal length of the great toe sometimes noticed is caused by the lengthening of the inner side of the foot by the conversion, more or less complete, of the arch of the instep into the straight line of flat-foot. It, moreover, may occasionally happen that the inflammation caused by the deformity, existing as it does in close relation to the epiphyses of young and rapidly growing bones, stimulates them to an increased growth.

Mr. Davies-Colley suggests the name "hallux flexus." I must beg to protest against the adoption of this term, as, if my pathology be correct, it implies a misconception of the truth: for it is not in reality a flexion of the hallux, but of the metatarsal bone. I would suggest the name "hallux rigidus," as free from the above objection.

Rheumatism and gout have, I believe, nothing beyond an accidental relation to this disorder.

In confirmation of the views expressed above, it must be borne in mind that "hallux rigidus" always occurs in young growing people, who are constantly on their feet—in short, the very class which supplies nearly all our cases of flat-foot. Another, and to me, at least, a most convincing argument, is that I have never failed to cure any case of early disease (that is, before ankylosis) by taking proper means to support the instep.

In more advanced cases, where the pain is severe and swelling considerable, fomentations, rest, gentle support with light splints, and other such means will suggest themselves. When the more severe symptoms have responded to this treatment, the important point is to keep up the instep.

In the third and most advanced set of cases, where firm ankylosis is present, with contractions of muscles and ligaments, little, if any, real improvement can be expected from blistering, tenotomy, and the like; while the routine practice of using splints for an indefinite period is, as might be expected, merely palliative, and as a cure is as unsatisfactory as it is irrational. The proposal made by Mr. Davies-Colley is probably the correct one, namely, to excise the proximal half of the first phalanx; and I should treat the case in such a way as to ensure a certain amount of movement in the new joint.

REMARKS ON THE TREATMENT OF QUINSY, ESPECIALLY IN INFANTS.¹

By W. E. GREEN, M.R.C.S.

THE subject of quinsy is one which has had a special attraction for me for many years, on account of its painful nature, its frequent recurrence in the same individual, and the rarity with which one was able to abort a case, or do more than wait until Nature came to the relief about the ninth day, or we were able to shorten the sufferings by the knife, often a most difficult matter, owing to the impossibility of opening the mouth. We were not idle even then, the treatment often commencing with free scarification of the tonsil or a blister behind the ear, and steam inhalations, while drugs of many kinds were used, of which aconite was the favourite, and was followed or given either with chlorate of potassium, perchloride of iron, or bark, and, to promote suppuration, one-tenth of a grain of calomel every hour. Even with these heroic procedures, we rarely cut short a case.

In 1875 I filled up a return on the subject, issued by Dr. Brunton in the *Practitioner* (this being one of the first attempts at collective investigation of disease). It was not until the following year, when, in talking over the subject with my cousin, the late Dr. Maund, he told me he found guaiacum give more relief than any other drug. From that time I have nearly always used this drug, but have not found the desired result from it alone. Then I was led to give aconite with it, and have found this treatment increasingly efficacious; but by experience have come to the conclusion that it is better to give the drug more and more frequently, until at the present I am of opinion

¹ Read at the Ryde meeting of the Isle of Wight District of the British Medical Association.