Treatment. Again, two schools of thought :—

1. The mobile sponsors say the thing to do is to manipulate the foot, break down the adhesions, and start the next day on a vigorous course of massage, full range movements and flat-feet exercises. In some cases where the strain is not severe, *i.e.*, where the fibres of the ligament are stretched rather than ruptured, it may be treated by the exercises alone, which, by increasing the tone of the foot muscles, remove the strain from the ligaments once more.

2. The second group would treat the condition by fitting an arch support to remove the strain from the ligaments, and this certainly gives relief; but it makes the foot more stiff and usually the condition recurs, when a higher support must be fitted, making the foot still more stiff.

To summarise the various points of view on painful feet, I think the best line of treatment is: Having diagnosed a foot-strain or a fallen arch, whichever you wish to call it, the patient's age should be ascertained and, if it is *under* 50, they should be treated by a manipulation, followed by flat foot exercises, faradic foot baths, massage, and full range of passive movements. If the strain be less severe the massage, exercises and faradic foot baths (physio-therapeutic treatment) alone will usually be sufficient. If the patient be 50 or over, that is when the muscles of the foot are not likely to respond to treatment, then they should have massage, contrast baths—hot for 1½ minutes, cold for ½ minute—and arch supports; always provided the foot is not completely flattened by osteoarthritis. The arch supports tend, as we have seen, to make the foot more stiff, so that the support will have to be increased or altered in shape after a time, but at this age I think it is justifiable, and in fact the only thing to do! A word of warning about supports—some young patients insist on wearing supports either because they have, as they say "always worn them" or because of some reason which they themselves cannot explain—such people should be induced to wear a resilient, not a rigid support. If you *must* wear a support, do not just walk into the nearest shop and buy one; these, on the face of it, cannot be good for everyone, because no two people have the same shaped foot. Go to a centre where they are made especially to fit you. The modern support is made from a special material, which is put into the shoe while warm and soft, and the patient told to walk about for a time so that the exact imprint of the *active* foot is taken as the substance sets. And do not even do this without consulting the orthopædic surgeon attached to your hospital.

So we see that the important thing in preventing foot strain is the condition and tone of the muscles and not the shape of the arch.

"People with flat feet are said never to suffer from flat feet."

The causes of the foot strain, apart from bad shoes, are :—

1. Diminution in muscle and ligamentous support, which occurs in rapid growth, in convalescence from illness, or after any severe trauma to the leg.

2. Excessive weight, either body weight or the carrying of weights.

3. As we have seen, over-use of feet.

4. Tight Tendo Achilles. If this tendon is *so* tight that the heel cannot easily reach the ground, as it often is, especially after being in bed for any length of time when a cradle to relieve the weight of the bedclothes has not been used, then every step will be an attempt to flatten out the arch of the foot, with resulting strain on the ligaments at every step.

Gait in foot strain is altered to a "Charlie Chaplin" shuffle, that is with the feet markedly externally rotated to prevent stretching painful ligaments, which would happen if the heel were raised off the ground. Pain in the knees and thighs may result from flat feet owing to the abnormal tension put on them by the abnormal gait.

Do not walk with the feet turned out too much, the nearer to straight the better.

Never stand with the feet turned out at 90 degrees, which used to be taught—30 degrees is ample to maintain one's balance and does not do any harm.

Exercises are numerous. I shall mention a few :—

1. Going up on the toes with feet turned inwards—if this is performed with feet turned outwards it tends to flatten the foot and therefore causes strain.

2. Attempting to pick up a marble with the toes, which exercises the toe flexors and the small transverse muscles.

3. Try the undulant or caterpillar type of walk.

4. For tight Tendo Achilles—stand facing a wall with the palms of the hands placed flat against it at shoulder level, with the toes turned slightly inwards, and standing on the outer border of the feet. Then move each foot alternately backwards a few inches until the calf muscles feel tight, then allow the elbows to flex and the body to fall forwards without raising the heels off the ground.

Metatarsalgia begins typically as a unilateral affection in women, as a burning or tingling sensation in the region of the third or fourth metatarsal head, especially when walking, gradually becomes worse, and may develop into severe lancinating pain extending to the tips of the third or fourth toes. It may come on suddenly, be very severe, and may necessitate removing shoes and manipulating the toes or squeezing the metatarsals together. Attacks become frequent until pain becomes constant and extends up the calf.

Causes.

1. Abnormal pressure developed on the digital nerves in cases of splayed out fore foot.

2. Irritation of medial plantar nerve as it passes under the foot.

Treatment.

1. X-ray to exclude traumatic or infective conditions.
2. Metatarsal bar, outside wedges.
3. Manipulation and exercise to follow.

Hallux Valgus or Bunions.

This is a condition in which the great toe is turned outwards to an abnormal degree, and the head of the first metatarsal becomes prominent and usually develops an exostosis, over which is found a bursa, which may be tender or may become infected.

Some accuse our ancestors the apes as being the chief cause, as in them the great toe is separate, like the thumb, and in Hallux Valgus it is tending to separate, as may be seen in an X-ray, while others say that it is tight stockings, the slippery slope, the high heel and the tapering toes of modern shoes which cause the condition. Certainly the trouble is more common in women than in men, and once the condition is started the long muscles do the rest. Others say that it is a weakness of the muscles of the forefoot, which tends to allow it to splay out as we have seen.

Treatment.

1. Prophylactic. Prohibit prolonged dancing in high-heeled shoes and tight stockings in adolescence, encourage exercises, correct posture.

2. Palliative. Metatarsal strap to prevent splaying, splints to wear at night, toe post incorporated in the insole or shoe, a digital stocking, *i.e.*, with a separate compartment for the great toe.

3. Radical. This depends entirely on the site of the pain and should not, except in extreme cases, be done for cosmetic reasons. If the pain is caused purely by pressure on the exostosis or bunion the treatment should be limited to removal of the exostosis; but if pain is present in the joint on moving the toe the treatment must be more radical, and removal of the head of the metatarsal or base of the

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