acentesis—short of free incision—are, mechanically speaking, imperfect.

It is impossible to actually reproduce the conditions which obtain in empyema; but for the purposes of this paper the following simple scheme may be used. It illustrates, I venture to think, the first case recorded. Fill a glass bottle close up to the neck with fluid, put in a well-fitting cork, then attempt to aspirate the fluid in the usual way. It will be seen that the fluid cannot be withdrawn. Next fill this bottle to within an inch of the top, cork as before, and repeat the experiment. This time a small quantity of fluid can be withdrawn. This occurs because the air is more dense in the bottle with the fluid than that in the aspirator-bottle, in which a partial vacuum has been made. When the density of the air becomes equalised in the two, the fluid ceases to flow.

The suggestion I have to make is that air should be injected into the pleural cavity in sufficient quantity to expel all the fluid. To obviate the danger of septic germs, I would propose that the air, previously to its introduction, should be filtered, warmed, and carbolicised.

The accompanying figure (p. 1167) represents the apparatus I have devised. It consists of a Wolff's bottle with two necks; into one of these necks is fitted a perforated India-rubber cork, provided with a long-stemmed glass funnel, tightly filled with carbolic cotton wool. The other neck is fitted with a similar cork, provided with a short glass tube (bent to a convenient angle) which communicates with the proximal extremity of a Higginson's elastic syringe. To the distal extremity of this syringe a fine hollow needle is attached. Just before use, the bottle is filled with a warm 5 per cent. solution of carbolic acid, one half of which is to remain in the bottle, while the other half is passed through the elastic bottle and tubes to thoroughly purify them, and drive out the contained air. When the elastic bottle is worked by the hand, it can only find itself with air, which has passed, first, through the carbolic wool in the glass funnel, and, next, through the carbolic solution remaining in the bottle, which moistens and warms it. The air is thus rendered perfectly pure.

Its mode of use is as follows. The ordinary aspirator-needle is introduced into the *lower* part of the abscess-cavity, and as much fluid is withdrawn as can be, without causing distress; the moment that the outflow ceases, or if the patient begins to cough or feel distressed, then—provided always the physical signs indicate that the cavity is not emptied—introduce the fine needle connected with the Wolff's bottle into the *upper* part of the cavity, and pump in a little air.

The amount of air to be injected will, of course, vary with the case; but, at the completion of the operation, it would seem desirable that the air within the pleural cavity should be less dense than the external air; in this way the lung is placed under conditions favourable to its re-expansion. As the air is slowly absorbed, these conditions continue during the progress of cure.

Moreover, if the suggested method be a good one, the presence of air in the pleural cavity after the withdrawal of the effusion, by supporting the vessels, ought to lessen the tendency to reaccumulation of the fluid, which, on the other hand, the presence of a diminished pressure decidedly favours. It should also do away with that dragging sensation which is not unfrequently complained of at the close of an ordinary thoracentesis.

I wish especially to emphasise that my plan is adapted chiefly for those cases in which the difficulty of removing the fluid depends on rigidity of the walls of the empyema-cavity. This, of course, is most likely to occur in adults with long standing disease. Finally, the condition may obtain in children. I consider the case quoted at the commencement of the paper as a typical one of the kind. Here a cure was ultimately obtained by a double opening; but I would suggest, when simple aspiration does not suffice, that this proposed method be tried before free incision, which is a somewhat severe measure, is adopted. I have to thank Dr. Symes Thompson for allowing me to try this plan on one of his patients in the Brompton Hospital. The case was fully reported in the *Medical Times and Gazette*, May 22nd, 1880. The chief points are as follow. A single woman, aged 23 years, inheriting phthisis, was admitted in February under Dr. S. Thompson's care. Her chest was expanded and motionless on the left side, and in its semi-diameter one inch larger than the right. The heart's impulse was distinct in the third and fourth spaces on the right of the sternum. On February 24th, she was aspirated, and sixty-six ounces of seropurulent fluid were removed. The fluid, however, gradually reaccumulated. On April 16th, she was again aspirated, according to the preceding plan. The chest was emptied; there was no cough or

irritation. When she left the hospital a month later, there was some dulness at the extreme base, and it was feared that reaccumulation would take place. This, however, did not occur to any appreciable extent. The patient quite recovered.

The amount of injected air can, of course, be measured, and its pressure gauged by a manometer, as shown in the drawing; but such additions to an instrument of this kind would complicate it without adding much to its practical utility.

I do not in the least imagine that this method will simplify all cases of difficult thoracentesis. To illustrate this, I may refer very briefly to a case, in which the difficulty of withdrawing the pus did not depend on rigid chest-walls. A child, aged 1 year and 8 months, was admitted under the care of my friend and colleague Dr. Eustace Smith, with the physical signs of a large left effusion; an exploratory puncture revealed the presence of pus. On attempting to aspirate, not more than half an ounce of pus could be obtained; the needle, however, seemed to move freely in what appeared to be a large cavity. On the following day another attempt was made; and again failing, I injected some purified air; but this did not materially help. Three-and-a-half ounces of pus were withdrawn after considerable difficulty, and several renewed attempts. Not feeling satisfied with the result, I decided to incise the chest-wall and put in a drainage-tube. But, for a while, even now, the pus did not flow freely, so a finger was introduced. This detected the presence of large flakes of membraniform lymph, which had to be removed with the dressing forceps. A considerable quantity of pus was then expelled, containing smaller flakes of lymph, besides pultaceous material. Listerian precautions were observed, and the case did well. This is the first occasion on which I have found actual membrane in the pus; but pultaceous material is not uncommon. It is difficult to guess the origin of the membrane; but it would seem possible that the cavity was subdivided into loculi by well organised lymph, and that these partitions were broken down by the aspirator-needle, as it was moved about.

Difficulties once occurred to me in tapping a serous effusion; they were only partially overcome after air had been injected. The fluid, some ten or twelve fluid ounces, after its withdrawal quickly coagulated into a solid mass. The injected air was rapidly absorbed; its presence in no way interfered with the progress of the case. Simple as thoracentesis appears, there are few operations in which the result is more uncertain. One can never predicate what amount of fluid will be withdrawn, nor what unexpected difficulties may not present themselves. I feel sure that those who have had a large experience of these cases will bear me out in this statement.

These cases are mentioned to show that there may be other causes than rigid chest-walls to interfere with the withdrawal of fluid. I should feel it necessary to apologise for mentioning them, were it not that I would anticipate criticisms and possible objections to the plan of treatment I am now describing. The cases in which this plan has been adopted, are at present too few to allow one to discuss its merits from a clinical standpoint; on the other hand, they are sufficient to shew that the method is not fraught with any danger to the patient; while the many almost intractable cases met with in practice but too clearly indicate that our present methods of treatment are by no means perfect or sufficient.

The mechanical principle on which the suggestion is based, is one, it seems to me, which can be discussed irrespectively of cases; for we constantly apply it in everyday life in transferring fluids from one vessel to another.

SOME CASES OF LAMENESS FROM ABNORMAL CONDITIONS OF THE FEET, CHIEFLY FROM CONTRACTIONS OF THE MUSCLES AND FASCLE.

By E. NOBLE SMITH, F.R.C.S. Ed.,

Surgeon to the All Saints Children's Hospital, and Surgeon to the Orthopaedic Department of the Farringdon Dispensary.

(Continued from page 1112.)

CASE V.—Miss H., aged 19, was brought to me through the recommendation of Mr. Malcolm Morris. She had suffered for many years from pain in the feet and difficulty of walking; symptoms which were gradually increasing. There was a contracted band of the plantar fascia of the left foot, as well as some contraction of the gastrocnemius. Here there was a constitutional tendency to contraction. Several members of the family had contracted fingers, and the

patient's sister had convergent squint of one eye. I divided the band of fascia, and the pain and constant discomfort soon subsided.

Symptoms similar to those to which I have referred may depend upon contraction of other muscles of the foot, such as the peronei or the tibials; but I will pass over these to consider a very common, but often very painful and troublesome affection of the great toe. I refer to the bending or contraction of that toe outwards from the middle line of the body. This is a very common deformity; and whether it be caused entirely by wrongly shaped boots, or as some think, by constitutional predisposition, there can be no doubt that the malposition of the toe is often brought about, and is always maintained and increased, by the form in which the

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 6A.

modern fashionable boot is made. The pointed toe of the boot has been accused of causing the evils referred to; and, for the purpose of allowing the feet to preserve or regain their normal shape, broad-toed boots are often recommended. Such ungainliness of shape is neither necessary nor desirable, because the toes of the majority of adults in this country slope from the great toe, making the foot naturally pointed, and there can be no advantage in having an empty space in the boot at the outer side of the smaller toes. Fig. 4 shows that an useless space is left by the broad-toed boot, and that, if it be made at all narrower than in the figure, the great toe must be pressed outwards.

The most important qualification of a good boot is that it should allow the phalanges of the great toe to occupy a position in a straight line with the metatarsal bone.

Fig. 5 shows the bones of the normal foot seen from above, and Fig. 6 shows the bones of a deformed foot, the great toe turned outwards.

Fig. 7.

Fig. 8.

When the great toe is turned out, away from the middle line of the body, the ligaments are stretched, the metatarso-phalangeal joint is irritated by unequal pressure, and is very likely to become inflamed; bunion is frequently produced; the tendons are thrown out

of gear, so that they drag upon and irritate their sheaths in the neighbourhood of the joint; and the use of the toe as a lever in locomotion is materially lessened, or is entirely destroyed. The surgeon is frequently called upon to treat the various effects of this distortion; and, unless boots are first made which will allow room for the great toe to be placed in its proper position, treatment will certainly fail to give the patient permanent relief from his trouble. The anatomist Meyer has not considered this subject too trivial to receive careful attention. He states that, in a normal foot, the great toe lies in such a position that its axis, when carried backwards, passes through the centre of the heel. He shows these two figures as examples of (Fig. 7) an almost sound foot and (Fig. 8) the well-preserved foot of a child about two years old. He urges that the sole of the boot ought to be made in the shape of Fig. 9, in which

Fig. 9.

Fig. 10.

Fig. 11.

the line *a b* represents the dotted lines in Figs. 7 and 8. But it may be observed that he thus does not allow any space for the natural enlargement of the metatarso-phalangeal joint of the great toe; and, if the above outline be placed upon the figure of a sound foot, (Fig. 10.) which I depict as even narrower than that given by Meyer, it will allow either too little space for the joint referred to, or give too much space upon the inner side of the great toe. Moreover, the breadth of the proposed sole of the boot is much narrower than that of the natural foot. Meyer's outline for the soles of a pair of boots is given thus, Fig. 11.

Fig. 12.

Fig. 13.

Fig. 14.

I think I have already proved that such a form is incorrect. The point which I wish to urge, as the most important one, is that the axis of the phalanges of the great toe should be kept in a straight line with the metatarsal bone. Fig. 12 shows the sole of a normal foot. A line, *A B*, drawn, touching the outer edge of the great toe and the outer edge of the joint, falls far to the inner side of the heel,

showing that the side of the boot ought not to be made perfectly straight, as in Meyer's pattern, and as in many modern so-called hygienic boots. I would allow full room for the toe, and yet obtain a more elegant and comfortable boot than is produced by Meyer's pattern; and both elegance and comfort are worth consideration.

Fig. 13 represents the shape of a sole which allows room for the foot to occupy a natural position, presuming that a sufficient space is provided by the upper leathers.

Fig. 14 shows the application of this form of sole. If the toes should happen to be more square, of course the boot must be modified to accord with them. A full half inch of space should be allowed in length beyond the end of the great toe.

The heels should not be more than three-quarters of an inch in height, and should be broad enough to give a firm basis of support.

High heels allow the weight of the body to press the feet too forward in the boot; the anterior part of the foot is widened, power is lost; the muscles of the calf being partially thrown out of use, the calf atrophies, locomotion becomes constrained, and there is a tendency for the tendon of the tibialis posticus muscle to slip forward out of its groove, for the foot to turn sideways, and for the ankle-joint to be sprained.

The boots having been provided, treatment can be commenced. If the great toe joint be inflamed, it must be treated upon general principles until acute pain has subsided. The toes can then be brought to their natural position by means of attaching them by strips of plaster or tape to a thin sole-plate, or a metal splint can be fixed along the inner edge of the foot and toe. The other toes may also require treatment, and the sole-plate is then very useful.

The toes are often contracted in the form called "hammer-toes," and, for their relief, bands of fascia may have to be divided. Hammer-toes may occur without any other deformity of the feet being present, and the second toe is that usually affected. I will give one case as an example. Mr. A. P. (surgeon) had been afflicted with this deformity of the second toe on each foot all his life. Lately, the contraction had increased, and the consequent lameness induced the patient to try to obtain relief. He had attempted to operate upon himself, but had failed to alter the position of the toes. Both toes were firmly contracted in a flexed position, in the manner shown in Fig. 15.

Fig. 15.

The deformity was probably congenital. The bands of fascia were intimately connected with the skin, and with the tissues close to the joint.

In the first place, I ordered a pair of boots for him which allowed full room for the toes. I then divided carefully the most prominent bands of fascia. I operated three times on each toe, at intervals of a few days, stretching out the toes gradually. I then obtained a half sole-plate, with slits opposite the sides of the displaced digits. The toes were then pressed into a proper position by means of pieces of tape, which were fastened below by means of plaster; each plate was attached, also, to the instep. The patient was able to go about his ordinary occupation during the whole of the treatment, and the this result was perfectly satisfactory. I should scarcely have thought this case worth reporting, but that I find that many medical men doubt the success of operations for this deformity.

The subject of lameness arising from obscure abnormal conditions of the feet is a very large one, and in this paper I have only recorded a few cases which seem to me interesting from their suggestiveness. It is from these comparatively slight troubles that patients often find greater difficulty in obtaining relief than from more definite affections; and, if I succeed in drawing attention to such "lesser evils," the purpose of my paper will be served.

THE VICTORIA HOSPITAL, CAIRO.

By HERBERT SIEVEKING, M.R.C.S.ENG.

THE above title (chosen by the Khedive) is that by which the first European hospital in Cairo, founded by the unwearied efforts of Viscountess Strangford, is in future to be known. The Egyptian Government has decided to give a grant for one year of £2,000, to be continued if the not very onerous conditions accompanying it be satisfactorily fulfilled. The chief of these are, that an average monthly minimum of in- and out-patients be treated; that a certain number of Arab students be allowed to attend at the hospital; and that all accounts be open to the inspection of the Government.

As the grant of £2,000 will not be sufficient alone, the hospital will contribute to its own maintenance by patients' fees. Single rooms will be reserved for first-class patients—*i. e.*, those able to pay all their expenses. Other in-patients will be charged at the rate of five and two francs daily, a fair proportion of beds being reserved for the poor. The out-patients—*i. e.*, all those able to afford it—will be charged one piastre (2½d.) a visit.

Several fresh wards have lately been added by making windows in the "hareem" part of the house, and the building can now accommodate comfortably seventy patients. The committee, composed of the first English residents (who, I am glad to say, have already rendered great assistance), with Sir Edward Malet as their President, held its first meeting on January 8th; and, if any proof were necessary of the need for such an institution as Lady Strangford's work supplies, it might be found in the general good wishes and valuable help which have come from all quarters, English and native.

The sick leaves, at the present moment, of the persons in Government employment reach an incredible number of years; Europeans, in case of sickness, have to be sent to Alexandria to the Deaconesses' hospital, and the natives can only be got to enter the Arab hospital here in the company of a policeman. I have paid many visits to the latter establishment, and I must say I cannot wonder at their aversion. I saw lately an operation for elephantiasis. It lasted exactly one hour, and must have been very painful, as the skin-incisions were large. No chloroform was given, the woman being held down by students crowding on all sides; towards the end, one of the surgeons suggested an anæsthetic, which excited intense scorn in the operator, who proceeded to push in the needle, with points like pin-heads, now and then resting himself the better to maintain an animated discussion as to the lady's subsequent matrimonial prospects. We have one man at present in the hospital, whose thigh was removed at the upper third in the same way. There are certain wards set apart for sick prisoners; small boys charged with slight offences are mixed up with murderous and accomplished criminals, but all are alike in the matter of iron anklets and chains, which have to be worn even in bed, no matter how sick or juvenile the sufferer may be. The ill conduct and lack of improvement in these establishments are quite inexcusable, as many of the chief native medical men have studied at Paris, Vienna, etc., and have at least knowledge of better things. The regulation of prostitution having been forced on the Egyptian Government by the English authorities, the Arab hospital now contains about two hundred women, and their wards are simply disgusting. I trust, however, that the regulations have been effective, as considerable havoc was being made amongst the soldiers. The Council of Health having lately asked the views of the various consuls with regard to the extension of these regulations to European prostitutes, the representatives have unanimously replied in the affirmative, and this hospital was spoken of as the only suitable place for the purpose of such examinations. Isolated wards are being arranged for the reception of these cases.

Dr. A. Murison (who has for some years had extensive practice at Alexandria) has undertaken the duties of resident medical officer; and, on Lady Strangford's departure, two experienced nurses, and an English woman to superintend the laundry, will be left to assist him. Arrangements have also been made for two Coptic women to reside in the hospital to learn the art of nursing; and, if they are as apt and useful as the Arab ward-boys have been in adapting themselves to our requirements, they will soon become excellent nurses. The native wounded have proved very tractable, and have given no trouble whatever. They all belong to the "fellaheen." For adults, they are the most simple, childish, superstitious people imaginable. Several objected much to the splints, but all in the end conquered their fears, with the exception of two, for whom a foot-weight for fractured thigh, and a short back-splint, had peculiar terrors.