

Operation for the cure of clubfoot / illustrated by explanatory plates, the drawings after nature: being an appendix to a System of practical surgery.

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OPERATION

FOR THE

CURE OF CLUBFOOT:

ILLUSTRATED BY EXPLANATORY PLATES, THE
DRAWINGS AFTER NATURE:

XXIX
BEING

AN APPENDIX

TO A

SYSTEM OF PRACTICAL SURGERY.

BY

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OPERATION

FOR THE

CURE OF CLUBFOOT.

CLUBFOOT, a common malformation, is either congenital, or takes place in delicate children during teething. It may occur at a later period of life, from spasmodic contraction of the gastrocnemii, of other posterior muscles of the leg, or of the muscles of the sole of the foot.

The foot is turned inwards, outwards, backwards, or upwards. When inwards, as delineated in Plate I., figs. 1 and 2, the foot rests on the outer or fibular side, and the toes point across to the other foot, which is too often similarly deformed. This variety is named *varus*, or *talipes varus*.

Where the foot is everted, as represented in Plate IV., fig 1, the affection is termed *valgus*, or *talipes valgus*. When the direction is backwards, as shown in Plate I., fig. 3, the sole of the foot points posteriorly, and the individual walks on the toes ; this is denominated *talipes equinus*.

In the fourth variety, which is rare indeed, the sole is turned upwards, towards the patella, and the patient walks on

his heel; the extensors and anterior tibial muscle being contracted. This is named *talipes calcaneus*, and is represented in Plate IV., fig. 2.

Varieties occur between *talipes varus*, and *equinus*; *talipes valgus* and *equinus*; and *talipes valgus* and *calcaneus*.

These deformities depend on the slow and progressive luxation of some of the tarsal bones, and the consecutive derangement of their ligaments and muscular tendons. In many cases, abnormal bursæ are formed at the part where the foot rests on the ground.

As the child advances, the foot becomes smaller, atrophy of the muscles of the leg ensues, which may be confined to the diameter or the length of the limb; the latter being the more serious affection.

Taken immediately after birth, either of these deformities may not only be rendered less hideous, but, by proper apparatus, completely removed. I may here remark, that as much depends on the skill of the bandage-maker, as the dexterity of the operator; and Mr James Fortune, Princes Street, and Mr Robert Fortune, Nicolson Street, of this city, have been more instrumental in curing patients than the most scientific practitioners. Strange to tell, some surgeons of considerable notoriety divide the tendons, put the foot in a stiff leather boot, or apply a fracture splint to the leg, and dismiss the case. Not a few patients treated in this manner were soon in as bad a plight as at first. They required to undergo a re-division of the tendons, and have been ultimately cured by the use of the proper apparatus. I here publicly express my obligation to the Messrs Fortune, for without their skilful mechanical superintendence, I am satisfied many patients could not have been cured.

The object to be kept in view, is to turn the foot slowly outwards or inwards in the *varus* and *valgus*, and to make

such addition to the thickness of the sole of the shoe or boot as to bring the limb into play, that the child may use the deformed, as much as the sound, foot.

The division of the tendo achillis and of other tendons, as may seem requisite, greatly facilitates the cure : But at what age should this operation be performed ? A certain author contends that the sooner it is performed the better. I have known it done at eleven months old, but the result was a failure ; and this was to be expected, for, as must be plain to the meanest understanding, the child should be old enough to walk, where the due exercise of the muscles, ligaments, and articulations of the foot are indispensable for recovery. Without this, the operation must prove abortive. At the present moment, I have more than one patient waiting till, by being able to walk, the operation may be repeated with the wished for success. Two or three years of age is the earliest time at which the division ought to be attempted. I prefer three years, because the apparatus, however carefully applied, often frets the skin, and the cure is retarded, from the unwillingness of the child to put its foot to the ground.

Again, the operation ought not to be had recourse to, when the articular surfaces or facets of the bones of the tarsus have become so configured and hardened, that we cannot expect to remodel them ; the age at which this occurs is, generally speaking, about thirty-five, although some cases have succeeded where the life was further advanced. I have known it fail at forty years of age. Plate IV., fig. 3, presents a skeleton of a foot of an adult affected with *varus*, wherein the tarsal bones are ankylosed, showing the fruitlessness of any operation. This is copied from Bourgery and Jacob's splendid work.

Before operating, the surgeon should examine with great care what tendons and fasciæ are contracted, so that he may divide them all at one sitting. In *talipes varus*, the most

common variety of clubfoot, it is seldom necessary to divide more than the tendo achillis, and the inner portion of the fascia plantaris; sometimes the abductor pollicis pedis: and in rare cases, the tibialis posticus, the flexor brevis digitorum, the flexor longus pollicis pedis, the extensor proprius pollicis pedis, or tibialis anticus, may be involved.

Plate I., figs. 1 and 2, represent a simple and common case of *talipes varus*. The division of the tendo achillis, shown in Plate I., fig. 4, and Plate II., fig. 1, is done as follows:—The little patient is placed on the knee of an assistant, who is seated on a low chair, and secures between his legs the limb not to be operated on, and otherwise keeps the child from moving; another assistant holds firmly the diseased limb, immediately below the knee-joint, with its popliteal aspect pointing upwards; a third, the chief assistant, grasps the foot, as represented in Plate I., fig. 4, with his hands, *a, b*, prepared to stretch the tendo achillis, whenever the knife has been passed across it. The leg *c*, rests on the knee of the operator, who is also sitting. Every thing being thus adjusted, the operator pinches up the skin with his thumb *d*, and fingers *e*, of his left hand over the tendo achillis, a little above the malleolus internus *f*, while the tendon is relaxed, then carefully avoiding the sheath of the tendon, he inserts the small knife *g*, with its flat surface beneath the integuments, and carries it across the tendon. When satisfied that he has accomplished this, he removes his left hand, turns the cutting edge of the knife upon the tendon, as exemplified in Plate II., fig. 1, which is stretched by the chief assistant, and the least pressure or cutting motion of the knife completes the division. Only one puncture of the skin, it will be observed, has been made. The instant the knife is withdrawn, a pledget of lint is applied, and held firm by an assistant, for occasionally a vein is wounded, which, were it allowed to bleed, would produce troublesome ecchymosis, that might

end in suppuration. The knife is entered on the tibial side of the tendo achillis, in order to avoid wounding the saphena externa; and is barely allowed to extend beyond the outer or fibular margin of the tendo achillis.—See Lizars' Anatomical Plates, No. XXVII.

When the division of the tendo achillis has been accomplished, the operator should divide the plantar fascia, as illustrated in Plate II., fig. 2. An assistant grasps the toes with his hand, *a*, while the operator secures the heel, *i*, with his left hand, *e*; and while the fascia and integuments are relaxed, he inserts the knife, *g*, with its flat surface on the inner margin, carries it as far across the foot as he deems necessary, between the integuments and the fascia; he next turns the cutting-edge towards the fascia, and with pressure or a cutting motion, during which the assistant stretches the membrane, he divides it. If he considers the abductor pollicis involved in the inversion of the toes, he has only to insert the knife at the same aperture, carry it towards the metatarsal bone of the great toe, under the skin, and divide the muscle in question. A pledget of lint is immediately applied to this wound, for the reasons assigned, when treating of the division of the tendo achillis.

The surgeon should again examine whether any other tendons require division, and proceed accordingly.

He ought now to apply a bandage from the instep to the toes, and upwards to the knee, as represented in Plate III., fig. 1, and described in Part I., Plate III., fig. 1, and at page 34; over this a pasteboard splint, marked *k, k, k*, across the sole of the foot, upwards midway between ankle and knee-joints, with one on each side of the leg, marked *m, m*, from knee to sole of foot, and over all a bandage, *n*, to keep them secure. The patient should, lastly, be put to bed, having the leg on a pillow, and the foot raised. In general he had better be kept in bed for the next three days at least, living on

moderate diet, and having attention paid to his bowels. On the fourth day, the pasteboard splints and the inner bandage should be removed, as also the pledgets of lint if loose, but if not, they may be allowed to remain for a day or two longer, as in phlebotomy, see Part I., page 31. The leg and foot should now be rubbed or anointed with lard or butter, a calico roller applied as before, and the apparatus applied as exhibited in Plate III., figs. 2 and 3. The chief object is to keep the heel down, resting on the sole of the shoe of the apparatus; the straps, marked *o*, *o*, should therefore be first applied over the instep, and crossed; next the belt marked *r*, round the ankle joint, so as to keep the heel more securely down; thirdly, that, *p*, across the ball of the great toe, which is affixed to the steel spring, *q*; fourthly, the ring, *s*, with the straps and buckles, round the leg, close to knee-joint, having previously everted the foot as much as possible; and lastly, the straps, *t*, *t*, which extend from the toes to the knee. These produce great pain, by the pressure necessarily exerted on the articulations, in order to change their faulty position and relation, and in elongating the contracted ligaments; hence many days must elapse before they can be pulled up sufficiently to overcome the morbid condition of joints, ligaments, and tendons. In every case, these straps must be pulled up to their utmost within three weeks, in order to make the angle formed by the foot and leg to correspond with the sound leg, or as acute an angle as nature designed.

This apparatus must be removed daily, the leg and foot softened with lard, and occasionally washed, the calico bandage and the apparatus carefully applied, and the straps, *t*, *t*, tightened. In many, the straps, *t*, *t*, must be slackened at bedtime, in order to alleviate the pain; and in some, even the straps, *o*, *o*, across the instep.

On the sixth day, the patient should be coaxed to put his

foot to the ground with the apparatus on, and induced to walk, putting the heel down first, which method, gratifying to mention, gives much relief to the sufferer, and greatly facilitates the cure. He should walk a little several times every day, and the exercise should be increased, as the improvement warrants.

At the end of three weeks, the boot represented in Plate III., fig. 4, should be put on, and worn during the day, the patient walking as much as he can without fatiguing himself. At bed time, the apparatus must be substituted, and the straps *t, t*, pulled up, as far as he is able to bear them.

The apparatus must be worn for months during the night, and the boot during the day; and, when laid aside, a lacing up leather boot should be worn, and great attention paid, as there is a tendency in the foot to return to its abnormal condition, although the individual, after the second week complains much when any attempt is made to put the foot into its original malposition. The artificial bursa, and any thickening, are discussed by the application, morning and evening, of the tincture of iodine, or iodine ointment.

The apparatus, the application of which is illustrated in Plate III., figs. 2 and 3, consists of a foot-board of iron covered with chamois leather, marked *u, u*; within which is a cork sole, also covered, and stuffed with hair, marked *v*; a firm iron heel plate marked *w*, covered with leather, and cushioned inside. To this heel-plate is affixed the steel spring *q*, the different straps and belts, *o, p, r*, also a strap *x*, to prevent that marked *p* slipping off the toes. Across the foot board extends a narrow iron plate marked *y*, which is bent at a right angle on each side of the heel-plate *w*, upwards along which it runs for two or three inches, and is then simply jointed by means of a screw *z*, with a long iron strap, *A*, covered with leather, that is joined to the ring *s* round the leg. By means of this

apparatus, the individual can put his foot to the ground and walk about. It is of importance that he put his heel down in the first instance. There ought to be two cork soles, which must be used on alternate days, in order that their softness may be maintained, as the least pressure is liable to injure the foot. This apparatus is an improvement on Scarpa's and Little's by Mr R. Fortune.

The boot, Plate III., fig. 4, consists of a common lacing up leather boot, with an iron rod on the inside of the leg, extending from the sole to the ring round the knee, but with the peculiar advantage, of a powerful jointed spring, which gives a spring in walking, and propels the foot onwards. Without it, many would trip at each step. *a, a*, the leather boot; *b, a*, broad leather strap coming from the outer side of the heel of the boot across the instep, then divided into two narrow straps *c, c*, which run beneath the spring *d*, and are buckled to the heel; *f*, an iron strap or plate extending from the ring *g* to the sole of the boot, across which it runs. The boot has a common screw joint at *h*, and a beautiful propelling spring *d* affixed at *i*, and playing in the socket or staple at *k*. This apparatus has been long in use here in feeble and paralytic ankle joints.

I have stated, that in rare instances the *tibialis posticus* may require division; this should be done in the sole of the foot, and not in the leg, as recommended by some, for the *flexor longus digitorum*, as it lies superficially to the *tibialis posticus*, may be unnecessarily cut across, and the posterior tibial artery may be wounded.—See Lizars' Anatomical Plates, Nos. XXVII., XXVIII., and L. On stretching the foot, the tendon will be readily felt, as it passes along to its insertion into the *os naviculare*.—See Anatomical Plates, Nos. L. and LI. Here it can be easily divided.

When the *flexor brevis digitorum* requires to be divided, it should be done at the same time, and by the same puncture,

as the plantar fascia.—See Anatomical Plates, Nos. XXVII. and XXVIII.

Should the flexor longus pollicis pedis become the subject of operation, it ought to be divided near its insertion, as it runs along the first or proximal phalanx.—See Anatomical Plates, No. L.

The extensor proprius pollicis pedis is easily reached on the dorsum of the foot, as it runs along the metatarsal bone. The anterior tibial artery must be carefully avoided.—See Anatomical Plates, No. XXVI.

The tibialis anticus muscle should be divided as it passes along the os naviculare, and care must be taken not to wound the anterior tibial artery.—See Anatomical Plates, No. XXVI.

In *talipes valgus*, the tendo achillis, and the peronei muscles require division, and sometimes the outer portion of the plantar fascia, and the abductor minimi digiti. The mode of dividing the tendo achillis in this variety, is the same with that for *talipes varus*. The peronei muscles should be divided immediately beyond or distad to the malleolus externus as they descend, the brevis to the base of the metatarsal bone of the little toe, and the longus before it passes into the groove of the os cuboides.—See Anatomical Plates, No. LIII. and LIV.

When the outer or fibular portion of the plantar fascia requires division, it should be done nearer the os calcis than the inner portion, so as to guard against the external plantar artery,—see Anatomical Plates, No. XXVII.; and the knife should be inserted from the fibular or outer margin, and carried across the fascia, as described under *talipes varus*.

When the abductor minimi digiti is involved, the same puncture will suffice, but the knife must be reversed, the point must look towards the metatarsal bone of the little toe.—See Anatomical Plates, XXVII. and LI.

In *talipes equinus*, the tendo achillis, the plantar fascia, and

the extensor proprius pollicis pedis, and the tibialis anticus, may require to be divided.

In *talipes calcaneus*, the tibialis anticus, the extensor proprius pollicis, and the extensor longus digitorum require division; the mode of dividing the two former has been already described. The extensor digitorum ought to be operated on immediately above the anterior annular ligament,—see Anatomical Plates, No. XXVI., and this should precede the division of the extensor proprius pollicis, that the latter may protect the anterior tibial artery.

In some cases, especially the *talipes equinus*, there exists contraction of the hamstring muscles, as represented in Plate IV., fig. 6. Here the surgeon must deliberate which tendons and fasciæ are concerned. In the instance presented, it is the fascia of the leg, *a*, the tendo achillis, *b*, the inner and outer hamstring muscles. The patient should rest on a sofa, with his face downwards, and the poples upwards and relaxed; the operator stands on the inner or tibial aspect of the limb to be operated on; and the chief assistant grasps hold of the ankle. The fascia, at *a*, should be first divided, the knife being inserted with its flat surface, at *a*, and while an assistant extends the knee-joint, the operator turns the cutting-edge towards the membrane, and with pressure, or a slight cutting motion, divides the fascia, being careful to avoid wounding the external saphena vein. The fascia is occasionally so extensively contracted on each side, that the knife must be carried across between the skin and it, and the fascia divided on each side. In some instances, the division of the fascia is best done after the cutting of the hamstring tendons; in this case, the same punctures answered for both operations. A pledget of lint is to be applied afterwards.

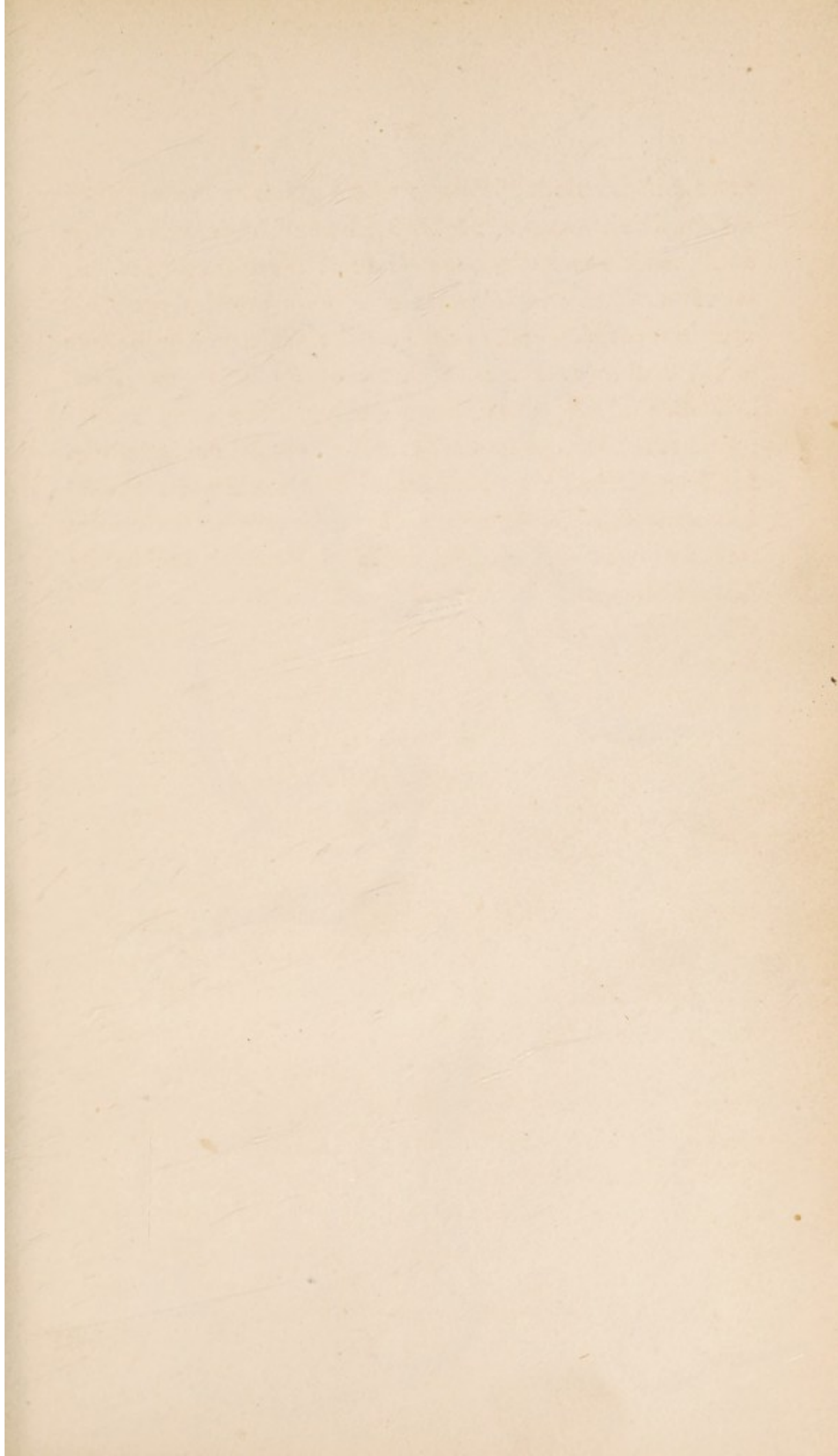
Let the operator next divide the tendo achillis, as described in page 7.

The inner hamstring tendons, namely, the semi-tendinosus and gracilis, should now be divided ; the sartorius is seldom involved, but if so, it is to be cut at the same time. The semi-membranosus muscle, in my opinion, should not be attempted to be cut, for it is too close to the popliteal vessels and the capsule of the knee-joint. On examining a limb in the dissecting-room, where these muscles were carefully divided, in illustration of the operation for contraction in the living body, the capsule of the joint was laid open, and the popliteal vein closely approached. Had that vessel been distended with blood, it would in all probability have been wounded. The knee-joint being relaxed, the skin over these tendons sufficiently above or proximad of the capsule of the knee-joint, is to be pinched up with the fingers of the left hand, as represented in the division of the tendo achillis, then the knife, inserted with its flat surface from the inner or tibial aspect, as at *B*, across, so as to embrace these two tendons, which the assistant then extends, and the operator turns the cutting-edge, and, with pressure, or a slightly cutting motion, divides them, being careful not to press the knife too deep, in case of wounding the popliteal vessels. The saphenæ veins must also be carefully avoided. A pledget of lint is lastly to be applied.

The biceps tendon is next to be divided in a similar manner, inserting the knife on the outer or fibular aspect, and when cut across, a pledget of lint is to be applied. Above the pledgets of lint a calico roller is to be applied, the patient put to bed, and kept quiet for three or four days. At the end of this time the bandage and lint are to be removed, both reapplied if necessary, and a longer splint than is used in diseased knee joint, put on the popliteal region of the leg. The further treatment is similar to that described for talipes equinus, or varus. In some instances of this operation, in consequence of the ecchymosis which followed, considerable suppuration has su-

pervened, and retarded the application of a splint, fomentations and poultices being required for two or three days. The splint must be worn for months, and if there be present any inversion of the knee, this can be overcome by a steel rod extending from hip-joint to the sole of the foot. The division of the vasti muscles appears too formidable for this deformity.

Plate IV., figs. 4 and 5, represent the knives used in these operations. The original of fig. 4, I obtained from my friend, Mr Rhind, who is the inventor of it, and have found it the best adapted for the division of the tendo achillis, fascia plantaris, and hamstring muscles. Fig. 5 is the knife used by Mr Little of London.



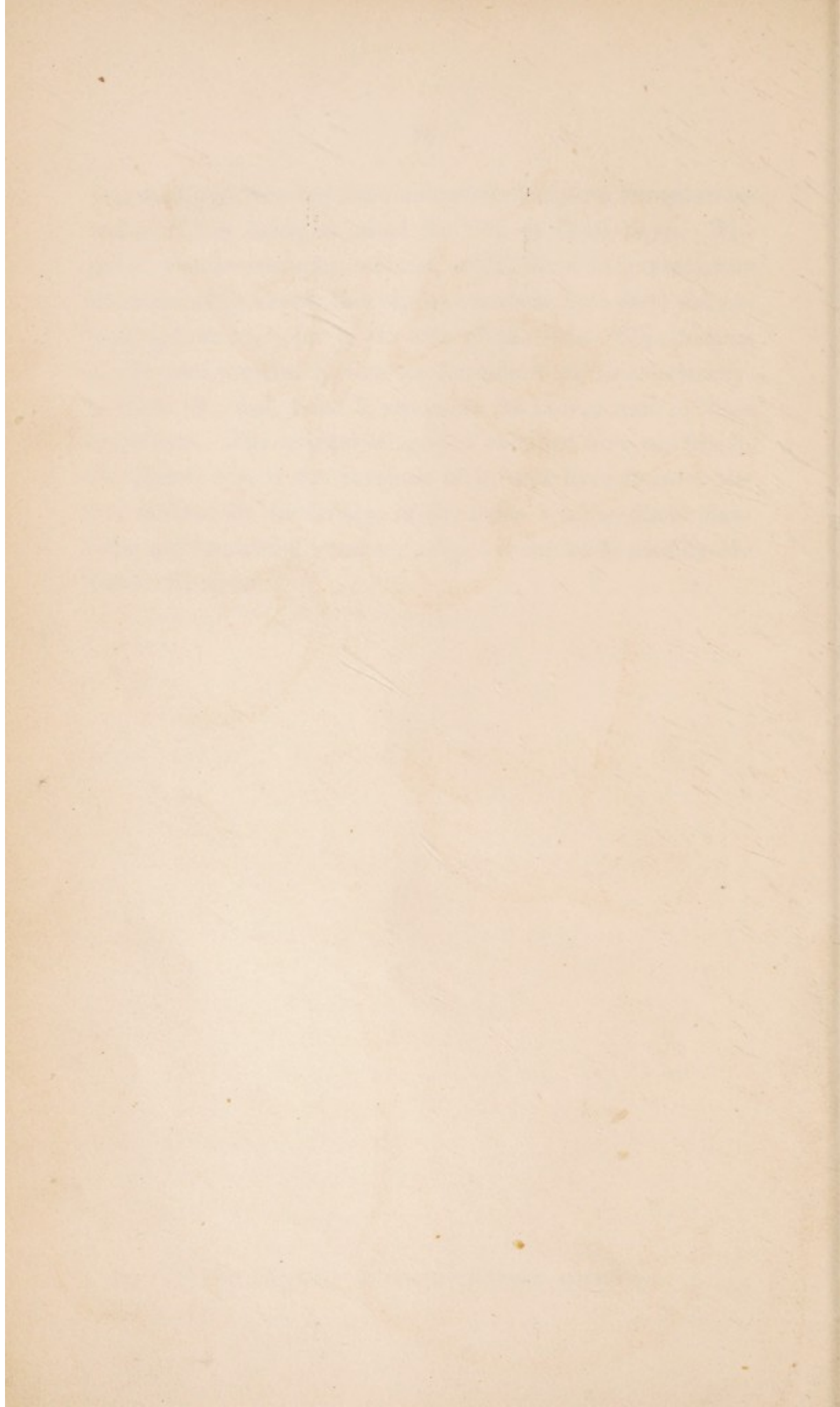


Fig. 4



Fig. 1



Fig. 2



Fig.



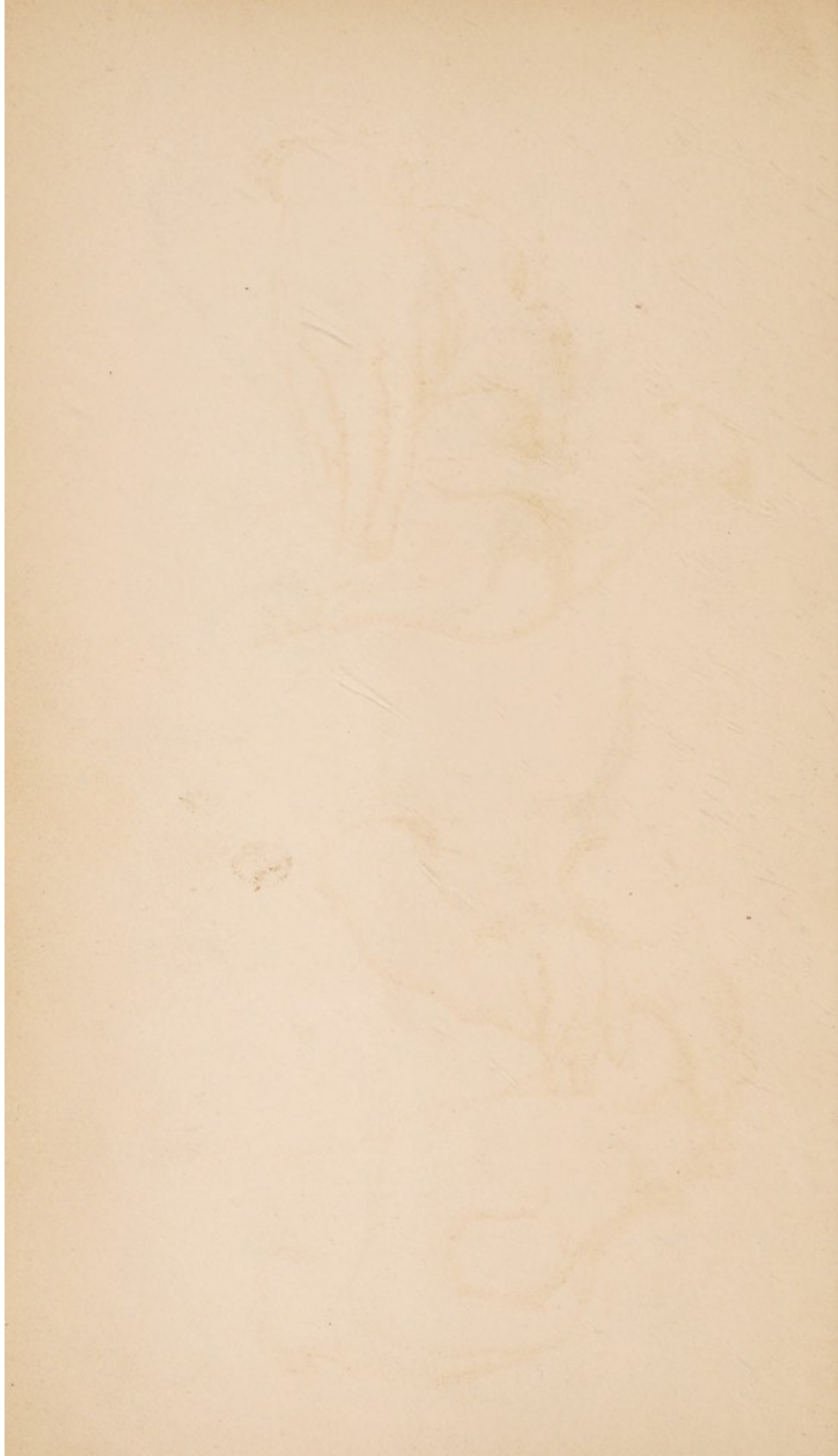
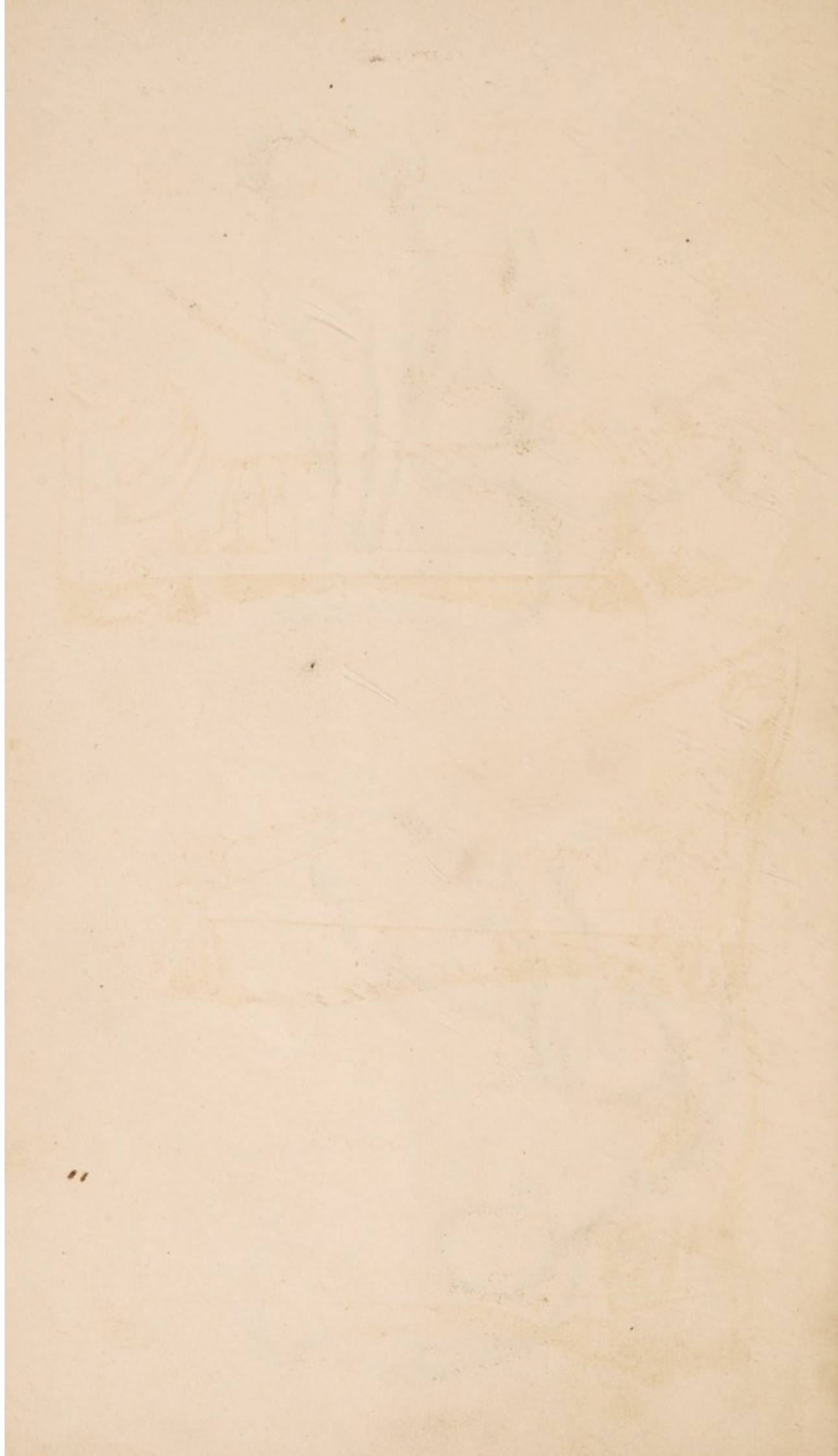


Fig. 1



Fig. 2





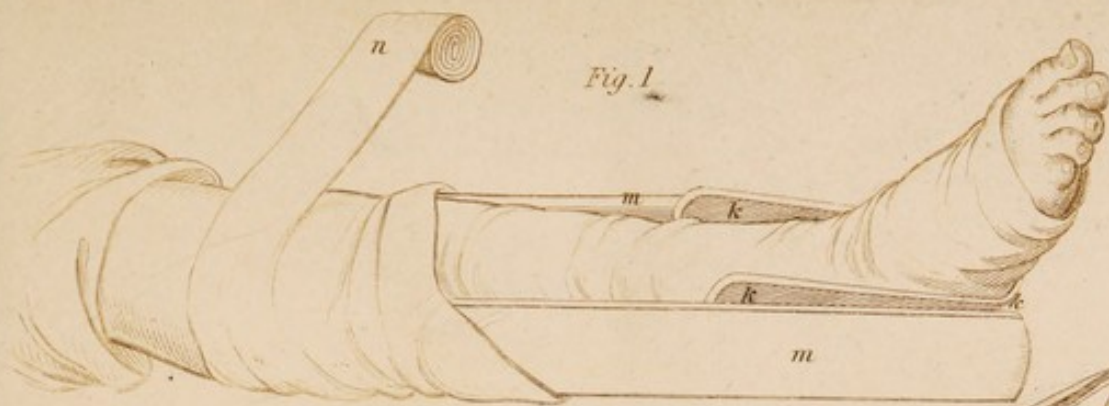


Fig. 1

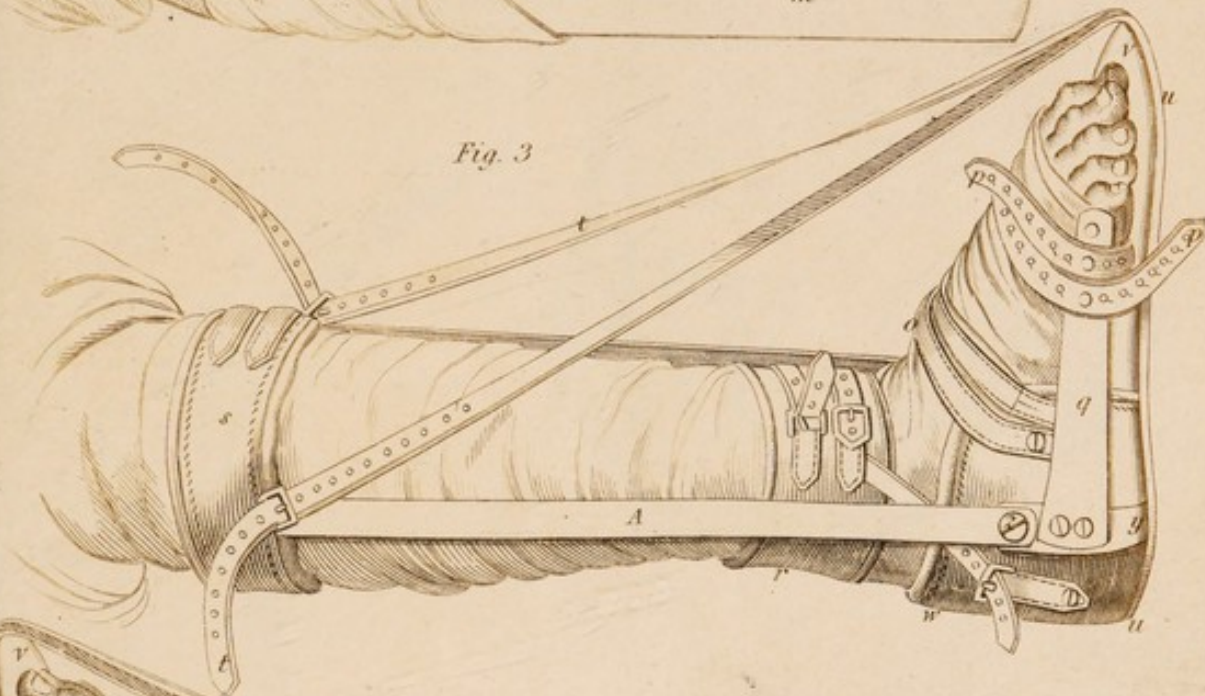


Fig. 3

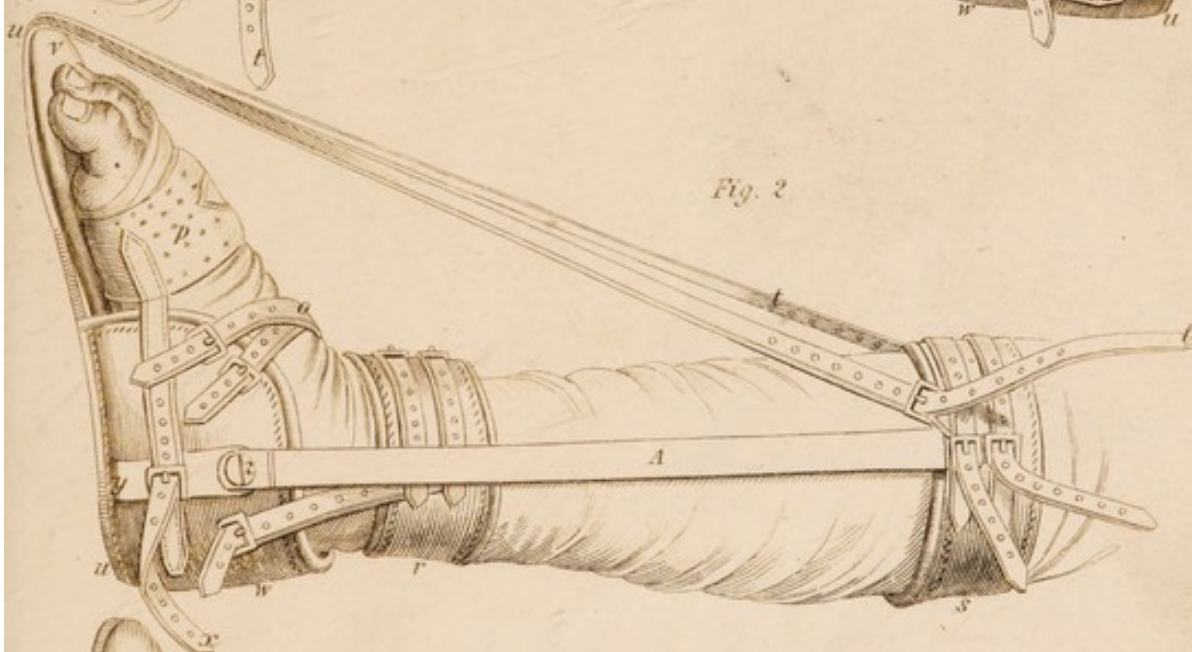


Fig. 2

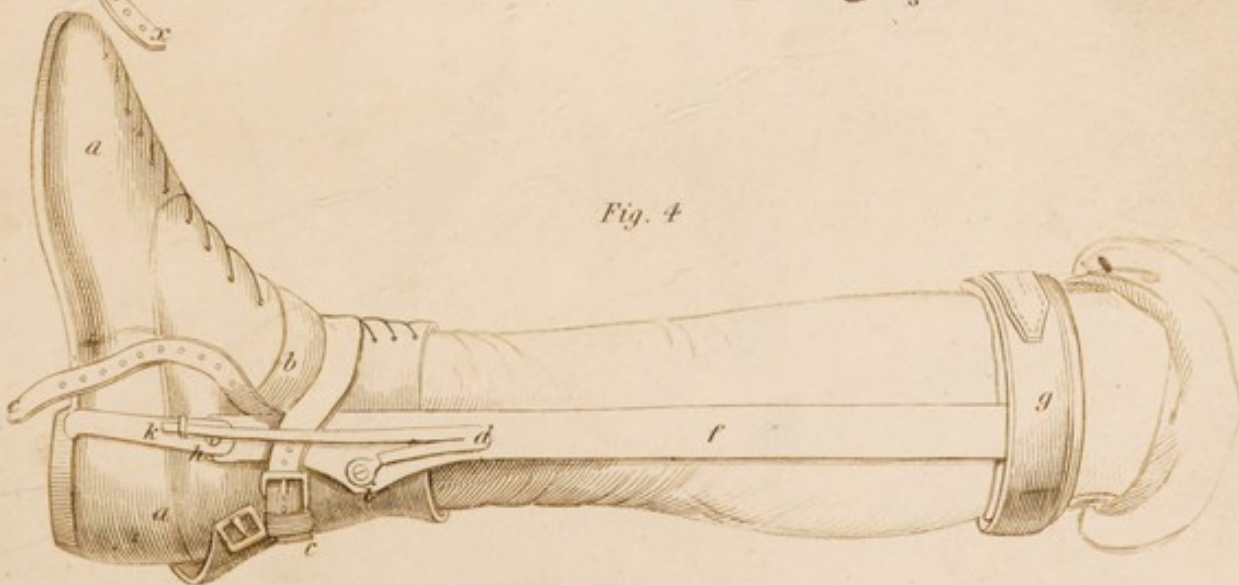


Fig. 4

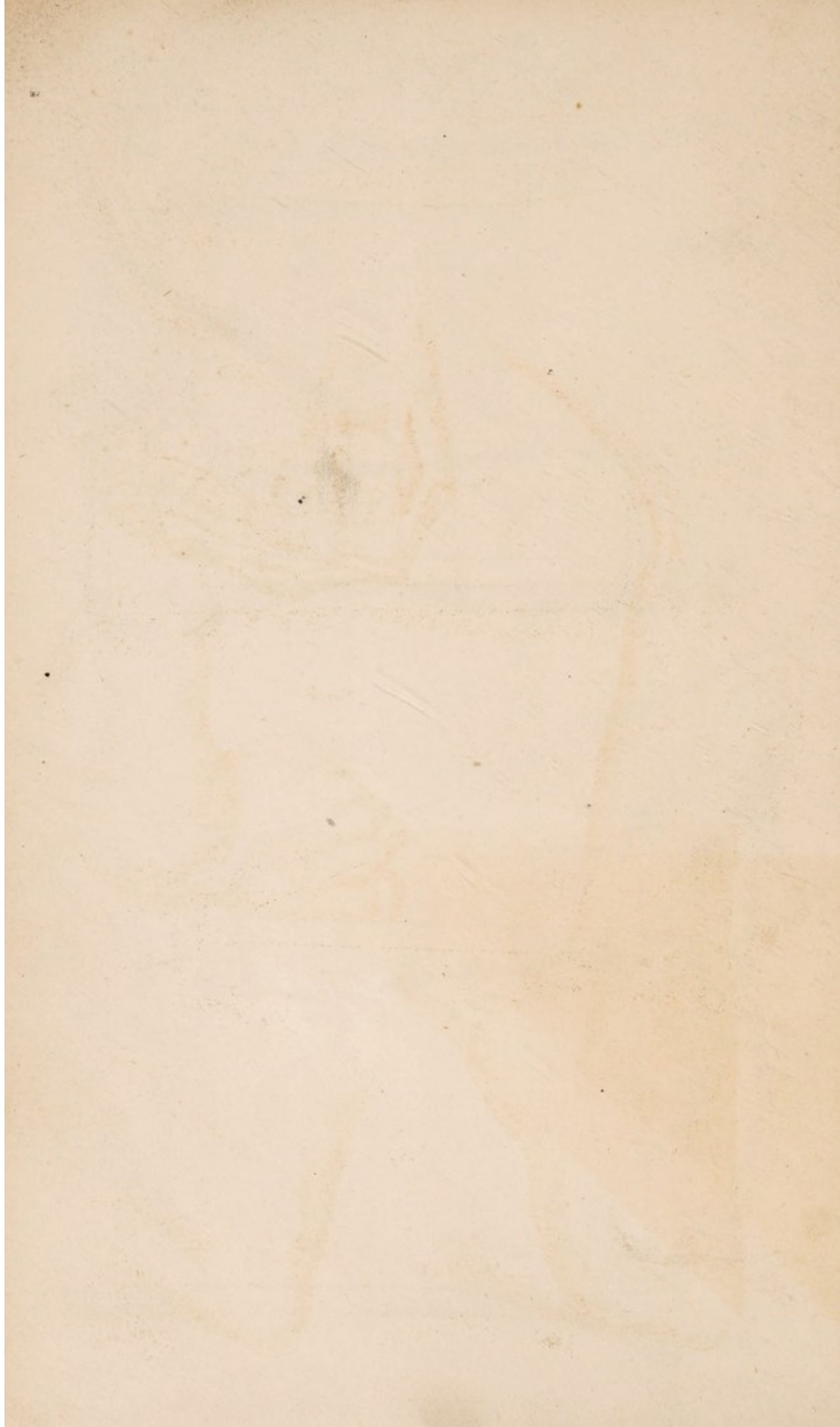


Fig. 4



Fig. 5



Fig. 3



Fig. 1



Fig. 2



Fig. 6



