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DRESS: ITS SANITARY ASPECT



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DRESS:

ITS SANITARY ASPECT.

A Paper read before the Brighton Social Union,

JANUARY 30TH, 1880.

WITH ADDITIONS

AND

EIGHT FULL PAGE ILLUSTRATIONS.

BY

BERNARD ROTH,

FELLOW OF THE ROYAL COLLEGE OF SURGEONS; MEMBER OF THE CLINICAL AND
PATHOLOGICAL SOCIETIES, LONDON.

The Barnes Museum

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P R E F A C E.

ALTHOUGH I have thought it best to retain the popular form in which I first delivered the substance of this pamphlet, I hope it will not prove uninteresting to some of my professional colleagues. I remember, in my own case, that by the time I had finished my medical studies I had no idea of the pernicious effects of fashionable clothing, and it was not till I began to devote myself specially to the treatment of spinal and other deformities that my attention was drawn to the subject. In my experience medical men, as a rule, look upon dress as below their notice, although so much preventible disease and suffering are distinctly traceable to it, when outraging, as it too frequently does, all physiological teaching.

SEPTEMBER, 1880.

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DRESS : ITS SANITARY ASPECT.

To be perfect a dress should protect the body from cold, and maintain an even healthy temperature from head to foot. There should be no constriction or pressure on any part, impeding the circulation of the blood and lymphatics, and causing congestion, a preliminary stage of numerous diseases. At the same time regard may be paid to the existing mode of dress, so as to avoid peculiarity, but with such modifications as to offend against the laws of health as little as possible. Ladies are the principal offenders against sanitary laws as regards dress, and my remarks have therefore to be addressed chiefly to them; men's dress, however unlovely from an æsthetic point of view, is on the whole both healthy and convenient.

The materials used for dress are either *animal*, as wool, fur, silk, alpaca, &c.; or *vegetable*, as linen, cotton, straw, bark, &c.; or both animal and vegetable combined. These materials have different properties, according as they are good or bad conductors of heat, and according as they are more or less easily charged with moisture. By a *good* conductor, we mean a body which absorbs and gives off heat readily; by a *bad* conductor, one which absorbs and gives off heat with difficulty. Hence those materials which are the worst conductors are the warmest, because they preserve the animal heat, whilst good conductors allow the surface of the body to cool so rapidly as to be only suitable for hot climates, or during summer. Clothing is also warm or cold, according as it absorbs and gives off moisture more or less rapidly. Thus linen materials, which absorb and give off water very readily, are much cooler than woollen, as these do so very slowly, and can retain a large amount of moisture without its being felt by the wearer. The warmth of the dress depends, too, on the way it is manufactured. It is an established fact that the weight of a material may be largely diminished

without destroying any of its heat-preserving powers, and this may even in some cases be increased by manufacturing it very loosely, so as to contain a quantity of air in its meshes, stationary air being a bad conductor of heat. It is in this way that the silk and cotton-netted vests, with meshes half an inch in diameter, which have been lately introduced, are so warm and sanitary, as, with the aid of the linen or other garments worn over them, a stationary layer of warm air is kept continually next the skin.

In warm weather the clothing should be loose, so as to admit freely of currents of air passing over the surface of the body; in winter it should be moulded to the figure, but without being tight. The average temperature of an adult under healthy conditions is about $98\frac{1}{2}^{\circ}$ Fahrenheit, and as the temperature of our climate varies from below freezing-point, *viz.*, 32° Fahrenheit to upwards of 80° Fahrenheit in the shade, clothing has to be adapted to variations of more than fifty degrees of temperature. There is a definite relation, within certain limits, between the amount of food required by a human being and the quantity of his clothing; the more warmly a man is clothed the less food does he require, his surroundings being the same. The converse is also true. The colour of the external dress is of some importance. Light-coloured materials are said to part with their heat less readily than dark or black ones; so light clothes should be preferred in cold weather.

A difference of opinion exists as to whether flannel should be worn next the skin or not. By flannel I include any woollen material wholly or only partially made of wool; in the latter case, combined with silk or cotton, which is often required, as the pure wool is very irritating to some skins. My opinion is decidedly in favour of its being so worn; flannel is not only a bad conductor of heat, and thus, by retaining the animal warmth, allows of less weight of clothing being worn outside, but it is also capable, as mentioned above, of absorbing a large amount of perspiration, and thus preventing too rapid an evaporation and consequent chilling of the body after exertion. No doubt many of the objections which medical authorities have raised to flannel being worn next to the skin have arisen from observations on the poor, who often will put on a flannel shirt or vest and keep it on till it almost falls to pieces. When I

was house-surgeon to a London hospital I have more than once noticed an expression of surprise when a patient suffering from a skin affection was asked when his flannel shirt was last washed, the idea that a flannel shirt required washing never apparently having occurred to him. Such habits, combined with a total absence of any general ablution of the body, will no doubt engender that tendency to chill and to taking cold which is so unjustly put down to the wearing of flannel by some writers. Where a flannel is washed at reasonable intervals, say at least once a week, and if the whole body is bathed daily, only good can come from wearing it next the skin. I have never known any harm to result, but only good, after ordering such under-clothing for patients, which I am constantly doing.

One close-fitting flannel under-dress, in the form of the so-called *combination garment*, which is in one piece and which should extend to the wrists and to the ankles, is infinitely more healthy as well as warmer than the numerous petticoats many ladies delight to hang one over the other in cold weather. Few seem to consider it necessary for retaining a healthy even temperature, that the arms, chest, and neck should be as well protected as the rest of the body, these parts being often only covered by a thin outer garment, or not at all when fashion requires a low dress, in which the lungs and other most important organs are exposed to chills and draughts. The seeds of many a lung-disease are sown by the foolish practice of putting young children of both sexes in low-necked frocks and under-garments, not only in summer, but even in winter. (See Pl. 5, where the curved line *c d* shows the average level of low-necked dresses and of ladies' ordinary under-clothing.) Compare this want of clothing of the upper part of the chest with the many layers of materials which overlap one another, in a zone three or four inches deep, round the waist of nearly every woman. The waist-band of almost every article of ladies' dress, whether coming from above or from below, is at least double, so that few have less than ten or twelve layers of clothing heaped one over the other at this part of the trunk. This tends to produce congestion in the very important organs lying in this region, not only from excessive heating, but also from the constriction which cannot be avoided when so many bands are used. (See Pl. 5, where the line *a b* represents the injurious ordinary position of petticoat and other bands.)

I must now very briefly direct attention to the structure of chest, abdomen, and pelvis, and their contents, which constitute the trunk. The bony skeleton of the chest or thorax consists of the strong but flexible spinal column behind supported on the pelvis or hips, and of the breast-bone or sternum in front, which are united from behind forwards by the ribs, twelve in number. Of the latter, the upper seven are directly fixed to the breast-bone by their cartilages, and are called true ribs; while the lower five are less and less fixed anteriorly, as they proceed from above down, and are called false ribs; the last two, being quite unattached in front, are known as the floating ribs. (See Pl. 1.)

The heart and the large blood vessels and food passage, with the lungs on either side, occupy the greater portion of the chest cavity, which is separated from the abdominal cavity by the muscular partition called the diaphragm or midriff. The abdomen contains, on the right and reaching towards the left, the liver, the largest organ of the body; on the left, the spleen; behind, the kidneys; and in the middle, the stomach; all more or less close to the midriff, while the intestines, &c., occupy the rest of its space and that of the pelvis. (See Pl. 3.)

The lower ribs which are least supported in front are precisely those which are influenced by anything tight about the waist; thus close-fitting unyielding *stays*, as generally worn, gradually compress the yielding lower ribs more and more, till their anterior extremities, instead of being far apart, meet almost or quite in the middle line. (Compare Pl. 2 with Pl. 1.) This deformity occurs so gradually during years of growth, that the wearer is generally quite unconscious of having disfigured herself, and I have never yet met with a lady who owned to having a tight pair of stays. "I can put my whole hand inside" is the usual reply when I find fault with a patient. This is generally quite true; for, by drawing in the abdominal muscles which act upon the anterior extremities of the ribs, by raising the diaphragm, and by slightly inclining the body forwards, the girth of the trunk can be still further diminished. The real test is to have the stays opened and all other constricting bands loosened, and to request the patient to breathe deeply and slowly a few times, with the arms directed upwards if necessary, and then to ask her to fasten the *outer* dress alone while holding the body as erect as possible. It is generally impossible to bring the dress together

after such an experiment, because the chest, having at last a chance of freedom, has expanded a little, and refuses to be put back into its narrow prison.

This pressing inwards of the ribs, which become in time permanently deformed, causes necessarily a very great diminution in the size of the chest and abdominal cavities. (Compare Pls. 1 and 2; also Pls. 3 and 4.) One very serious effect of this is that the bases or lower parts of the lungs do not perform their functions properly, for there the chest-walls can hardly move at all during respiration, in addition to their volume being much diminished; the upper halves of the lungs have consequently to do more than their proper share of work. At the same time the respiratory action of the diaphragm is obstructed not only by the reduced extent of its attachment to the ribs, but also from the compression of the abdomen. This insufficiency of respiratory power and diminution in the size of the lungs can account for many a serious illness, the way for which was prepared by deficient oxygenation of the blood; besides, all the above-mentioned abdominal organs are displaced downwards, because there is no longer any room for them at the so-called "elegant" waist; the liver reaches down to the hips (pelvis), whereas in its natural position it should hardly project beyond the margins of the chest cavity. (Compare Pls. 3 and 4.) This displacement and pressure on these important organs offer a serious obstacle to the proper carrying out of their special functions; hence indigestion, congestion of the liver, and similar troubles. The deplorably large percentage of women who have some displacement or affection of the womb is due no doubt to this pernicious habit of tight-lacing, which is much more general than may be supposed by anyone who has not paid special attention to this subject.

The 'Lancet' writes, on January 10th, 1880:—"The notion of 'improving' nature by forcing the feet into tight boots, and the divers other devices with which fashion beguiles the love of personal embellishment, are sufficiently monstrous; but the audacity of attempting to compress the trunk, which contains the central organs of life, 'for the sake of appearances,' surpasses belief. . . . Perhaps the recent death from tight-lacing, in which the heart was found to be so impeded in its action as to render life impracticable, may have some deterrent effect; but we doubt

it. Fashion will prevail, and wasp-like waists will be cultivated in defiance of nature and art."

In addition to the injurious effects already mentioned, tight stays are a common cause of so-called "weak" spine, due to weakness of the muscles of the back. It is well known in physiology that for a muscle to remain in a healthy condition it must be fulfilling the functions proper to it, *viz.*, of being constantly alternately contracted and relaxed. When muscles are prevented from being thus exercised they invariably waste. Anyone who has had either one of the long bones of the upper or lower extremities broken, or some local injury or disease which has necessitated complete fixation of the limb in splints for six weeks or longer, will remember how all the muscles of the quiescent limb wasted, and how it took some time to restore the previous muscular power. A tightly-laced pair of stays acts precisely as a splint to the trunk, and prevents or greatly impedes the action of the chief back muscles, which therefore waste and become weakened. The unfortunate wearer feels her spine weaker, thinks she wants more support, so laces herself still tighter: she no doubt does get some support in this way, but at what a terrible cost! Everything embraced by those tight stays is fearfully compressed; and it has always been an anatomical enigma to me to conceive how the numerous organs, which I know to be there, can possibly exist in some ladies, whose bodies are not inaptly compared to those of wasps.

I do not say that stays should necessarily be given up altogether, although many women would enjoy far better health if they were. Stays are no doubt of some use in supporting the bust of the adult woman, but this can be easily effected without pressing upon the lower ribs, and without obstructing the respiratory movements. Rational stays should be made of some yielding material, with narrow strips of elastic webbing let in from above down on the sides; and the fewer the pieces of whalebone, and the smaller they are, the better. Such stays allow of the proper respiratory movements of the lower part of the chest, and yet will not produce deformity, although fitting the waist sufficiently well to please the dress-makers. Modern taste is unfortunately so vitiated that when a woman tries to avoid deforming her body, and possesses a natural waist, unless she is very thin, remarks are at once made about her clumsy

figure, and these as frequently by men as by the deformed of her own sex. Indeed this degraded taste for acquiring deformed waists would seem to have even infected men, if the expensive advertisements of men's corsets, to be seen in so many newspapers, are profitable to the advertisers.

Ladies who do not wear stays often do themselves harm by wearing the waistbands of their skirts and petticoats above the hip bones (pelvis), as explained at page 7. In Pl. 5 the line *AB* represents the usual position of these bands. This can be easily remedied by wearing them really on or around the hips, instead of above them, and by giving them a wider depth and curved cut, as shown by *EF* in Pl. 5, which represents the proper position, shape and width of the petticoat-band. The upper edges of the hip bones (iliac crests) are easily felt on each side of the trunk; the circumference of the waist taken at this level, *a* and *b* (Pl. 5), is always two or three inches less than the circumference taken at *c* and *d*, about three inches lower down. The proper petticoat-band is therefore narrower above than below, and fits the hips too accurately to allow of its slipping down; at the same time no harm can possibly arise from pressure on the hard unyielding bones of which the pelvis is constructed.

Men and boys are also very apt to wear strong elastic and leather *belts*, at the level *AB* (Pl. 5), and may do themselves harm in predisposing themselves to rupture from injurious pressure on the yielding abdominal walls. Dr. Richardson, in a recent lecture, very properly objects to belts thus situated, but there can be little physiological objection to them when worn round, instead of above, the pelvic bones: in this position they hardly interfere at all with the action of the abdominal muscles necessarily brought into exercise during any physical exertion. I lived, some fifteen years ago, in a French garrison town, and remember being much struck by the extremely small waists of the French infantry officers, who wore very tight leather belts above their hips, quite deforming their bodies, and rivalling ladies in the "elegance" of their waists. The notorious physical inferiority of the French as compared with the German officers during the Franco-Prussian war may have been due in part to this foolish custom.

Dr. Richardson is quite wrong in recommending that ladies' dresses should be made to hang from the shoulders, and not from

the hips ; and shows that, however great his experience on most subjects, he cannot have seen very much of spinal lateral curvature. Growing girls and weakly women have sufficient difficulty as it is in holding themselves erect while carrying the head, neck and trunk, and upper extremities, without unnecessarily dragging down the shoulders by the weight of the long and heavy skirts exacted by fashion. It is much more sensible and scientific to attach the skirts to bands round the pelvis, as recommended above (see Pl. 5, E F), where only the solid bone is pressed upon. Another great objection to suspending the skirts from the shoulders is that the respiratory movements of the upper part of the chest are unavoidably impeded by this arrangement.

Braces are for similar reasons not so beneficial as Dr. Richardson believes, even for men who are not over-strong, and who would stoop less and find their chests freer by wearing braceless trousers fitted with an elastic band round, but not above the hip bones.

Tight *collars*, tight *sleeves*, and small *arm-holes* are bad, not only because they prevent freedom of movement of the upper extremities, but also because they interfere with the circulation of the head and arms, causing congestive headaches, and often cold hands and chilblains. No dress can be considered hygienic which does not allow of the arms being easily raised upwards by the side of the head. This is easily arranged, even in women's clothing, by giving a more oval shape than usual from above down, to the arm-hole, or by simply putting a V-shaped piece below it, between the sleeve and the body of the dress.

The absurdity of ladies' and children's low-necked under-clothing in exposing the upper parts of the chest to chills has been already referred to ; it should also be added that they are impediments to perfect freedom of the arms. When the wearer attempts to raise the arm upwards, the upper edge of the garment over the shoulder becomes immediately tightened, as can be easily understood by looking at Pl. 5, where c d represents the usual position of this edge over the shoulder-joint ; it offers sometimes a complete obstacle to the hand being raised higher than the head, especially if the body of the garment is fixed by tight stays.

A further proof, if any were required, of the much greater

tightness of ladies' clothing and of the great impediment offered by it to natural and easy breathing, is given by the fact that no medical man in his right senses would ever think of administering chloroform, or any other anæsthetic where perfect freedom of the chest-walls is imperatively needed, to a woman, without previously thoroughly loosening and unfastening all her bands and stays, although in the case of a male patient the most superficial inspection of the dress is generally considered amply sufficient.

Macintoshes or any clothing covered with a material impermeable to air and vapour are injurious if worn for any length of time. Watery evaporation is being constantly exhaled from the many square inches of skin covering our bodies, and escapes imperceptibly through ordinary porous clothes. Macintoshes condense this vapour on their under surface, and the wearer becomes enveloped in a moist and stagnant atmosphere very apt to produce chills and rheumatism. Such waterproof clothing should only be worn for as short a time as possible, and those which are provided with numerous ventilating holes preferred.

Veils, especially those ornamented with spots, &c., have a bad effect on the eyes. The 'Lancet' (Feb. 7. 1880) writes:—"Worse, because persistent, mischief is done by the practice of binding a veil tightly round the face in such a way that not only is the sight obscured, but the eyes are mechanically irritated by the fabric clouding them. Cases of something worse than mental annoyance and 'nervousness,' distinctly traceable to this cause, are falling under the observation of practitioners, and when the practice is denounced, 'fashion' is pleaded as its excuse. . . . Veils of to-day are semi-transparent eye-bandages, and must tend to disturb the vision, as well as to set up irritation in the eye-lids."

Descending to the lower extremities, we find cold and moist feet and chilblains frequently caused by tight *garters*, which retard the return of blood from the feet and legs. Enlarged or varicose veins are sometimes distinctly traced to the constriction of these bands, which not uncommonly cause darkly-pigmented furrows round the limb above or below the knee according to their position. Happily it is becoming more the fashion for ladies to wear stocking-suspenders attached to buttons or loops at the waist.

We now come to the important subject of the *coverings of the feet*. It is wonderful how much self-torture and discomfort are daily endured because it is the fashion to get our feet to fit our boots, and not our boots to fit our feet. The widest part of the foot is naturally at the root of the toes, and the corresponding part of the sole has, together with the heel, to support most of the weight of the body. (See Pls. 6, A ; 8, A.)

The healthy foot is exceedingly beautifully constructed ; it is not only arched from before backwards (see Pl. 6, A), but also from side to side, so that its tread has great elasticity—very important for preventing concussion of the spinal cord and brain. The heel is composed of a large bone, os calcis, lying on a thick pad of fat, and constitutes the hinder base of the antero-posterior arch, of which the joints of the roots of the toes (metatarso-phalangeal joints) form the anterior base. The transverse arch of the foot reaches the ground only on the outer border of the sole of the foot, while its inner base is raised one or two inches, and thus allows of the antero-posterior arch being visible. In Pl. 6, A, the longitudinal section is taken through the inner side of the foot, through the ball of the great toe. If taken through the outer side this arch would not be shown, because the whole sole touches the ground. Anyone can demonstrate this by walking with wet feet on dry boards or a sheet of brown paper, when the wet impression of the feet will be represented by two large spots (the base of the toes and the heel) joined by a thick short line on the outside.

All these beautiful provisions of Nature are set at nought at fashion's dictation ; instead of the gentle spreading out of the toes and yielding of the arches of the foot when a step is taken, the foot and toes are squeezed into a leather case much too small for them, keeping them stiff and immovable. (See Pl. 8, A B, which represents the same sized foot in a properly-constructed and in a fashionably-shaped boot.) The beautiful arch from before backwards is spoiled, and the elasticity of this and the transverse arch of the foot interfered with, by adding a narrow leather or composition heel two or three inches high, not under the natural heel, but so much forwards under the foot that its real pressure is largely transmitted to the middle, that is, to the weakest part of the antero-posterior arch. Nothing can be more senseless if any moderate amount of walking power is

expected. And this is not by any means all the harm done. Nature made our great toes straight and on a level with the inner margin of the foot. (See Pl. 8, A.) Fashion, however, decrees that the great toe should be bent inwards either above or below the adjoining intermediate ones towards the little toe, so that the point of foot or big toe should take the place of the middle ones. As a result the root of the great toe resents the pressure, and the joint becomes tender, or rather the parts superficial to its inner aspect, from the great friction of the narrow-pointed boot. The consequence is a painful tumour, formed by the inflammation of the bursa or lubricating sac which naturally exists here under the skin; this inflammation extends to surrounding tissues, both skin and bone, and we have thus a fully-developed bunion, with its attendant discomforts and complications.

I was consulted a short time ago about a young lady with lateral curvature of the spine; on examining the feet, as I always do in such cases, I found them both slightly flat-footed with incipient bunion over the joint of each great toe. She assured me that her boots were very large; so I traced the outline of one foot (the right) and that of the sole of the corresponding boot, with the result shown in Pl. 7, which is exactly three-quarters the real size; the strong line represents the shape of the patient's foot, and the dotted line that of the boot-sole. Comment is unnecessary, and yet the patient was not wearing particularly fashionable boots.

Flat or splay feet, or, as they are now generally termed, "weak ankles," are produced by a giving way of the top or keystone of the arches of the foot, which causes its inner surface to bulge inwards and even to touch the ground, instead of presenting the natural hollow which ought to be seen there. This deformity is largely due to fashionable boots with high heels, and to a relaxed and weakened condition of the ligaments and of the leg tendons which extend into and help to support the arches of the foot. Tight garters, which have been already discussed, tend no doubt to aggravate or predispose to "weak ankles."

Tight boots are also an element in the production of cold and wet feet, and often cause deformed and in-growing toe-nails, not to mention corns. Ladies again are the chief offenders against sanitary laws with regard to boots. A man rarely wears a high

heel, and if he does it is a wide one, while exactly the reverse is the case with the other sex. It is the exception to find a lady who walks really well out of doors ; the high heel is generally more worn on one side than the other, with the effect of causing it to imitate more or less closely the leaning Tower of Pisa.

Pl. 8, A, gives the outline of a properly-constructed boot made to fit the foot without deforming it. The inner margin of the boot should be almost straight, so that when the feet are placed together they should touch all the way from the heels to the ends of the great toes. Men's boots are almost as bad as women's in not having this shape. The boot-heel, as indicated, should be as broad as the wearer's heel, and should not exceed double the thickness of the boot-sole. Boots made with the waist of the boot-sole thinner and of more yielding or elastic leather are far the most comfortable, as they allow of the natural movements of the feet during walking.

In the 16th century boots and shoes were worn of such an enormous width in this country that a law was passed prohibiting, under penalty, the wearing of boots more than six inches across the toes. Thus do fashions alter !

Those who have unfortunately deformed their toes by wearing too narrow and too short boots will find stockings or socks made with toes, just like the fingers of a glove, very useful in helping to restore them to their natural form and position.

To sum up, Dress, to be perfect from a sanitary point of view, should be so arranged as neither to overheat or leave unprotected from cold any portion of the body ; it should be adapted to the sudden changes of temperature to which our climate is liable, and for this reason flannel should, if possible, be worn next to the skin ; it should not interfere with the circulation of any part, nor with the free use of the limbs, and the respiratory movements of the chest and abdomen ; lastly, it should not produce deformity, but should everywhere follow instead the natural lines of the human body.

EXPLANATION OF PLATES.

PLATE 1.—Normal female figure, showing skeleton.

PLATE 2.—Female figure deformed by stays, showing skeleton.

PLATE 3.—Normal female figure, showing relation of internal organs.

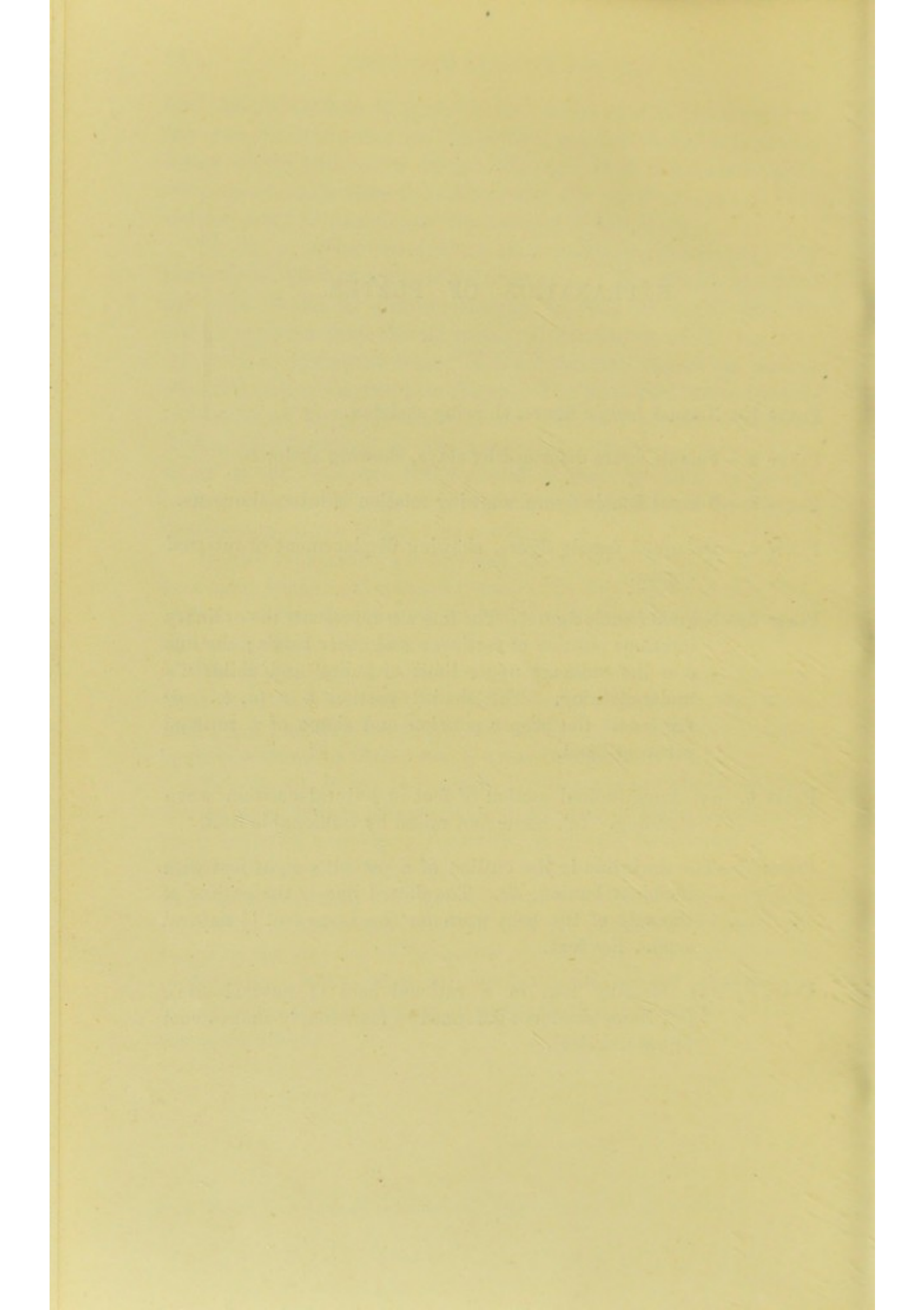
PLATE 4.—Deformed female figure, showing displacement of internal organs.

PLATE 5.—Normal female figure. The line A B represents the ordinary injurious position of petticoat- and other bands; the line C D the ordinary upper limit of ladies' and children's under-clothing. The shaded portion E F (*a, b, c, d*) represents the proper position and shape of a rational petticoat-band.

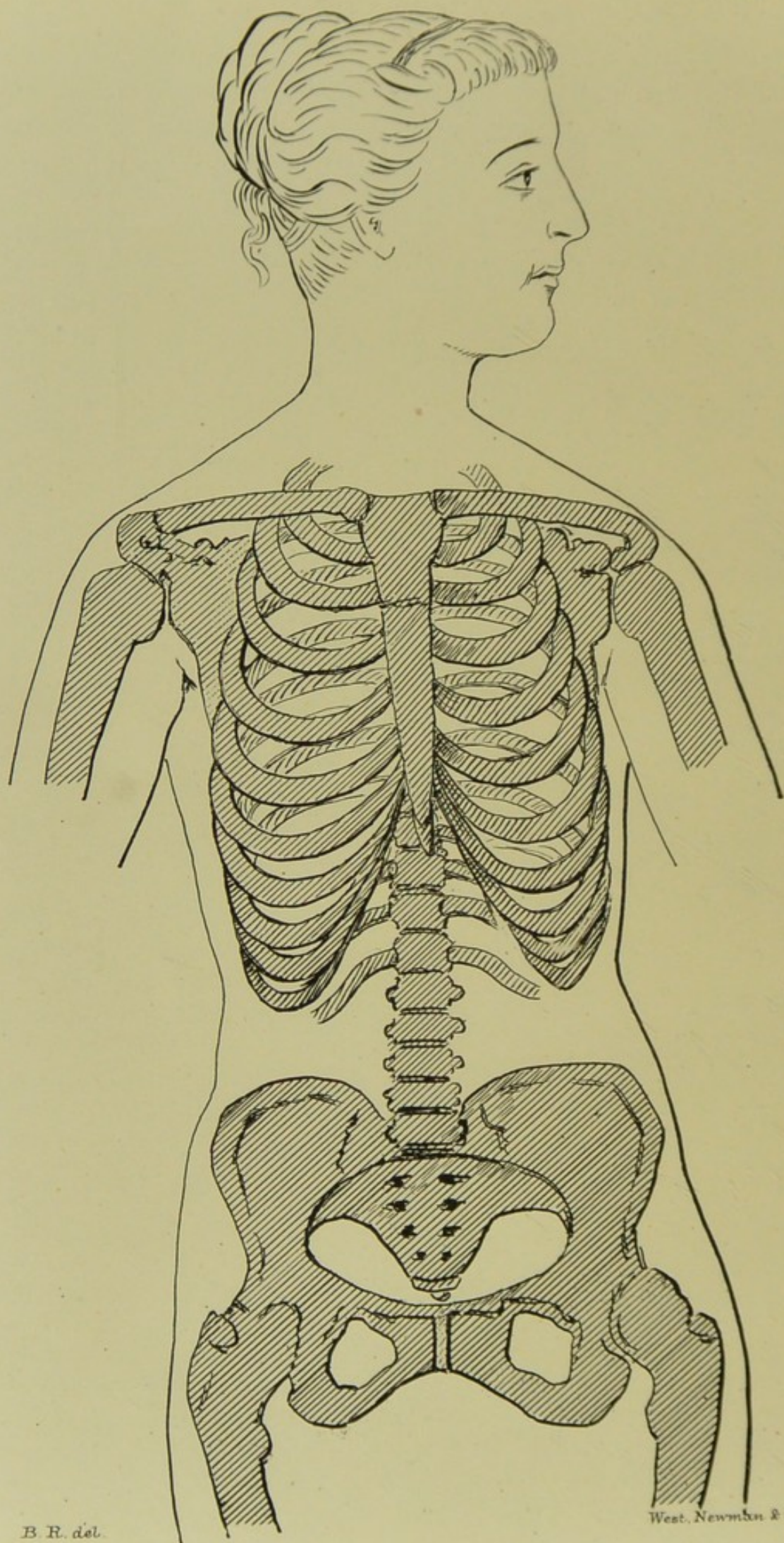
PLATE 6.—(A). Longitudinal section of foot in natural position when standing. (B). Same foot raised by fashionable heel.

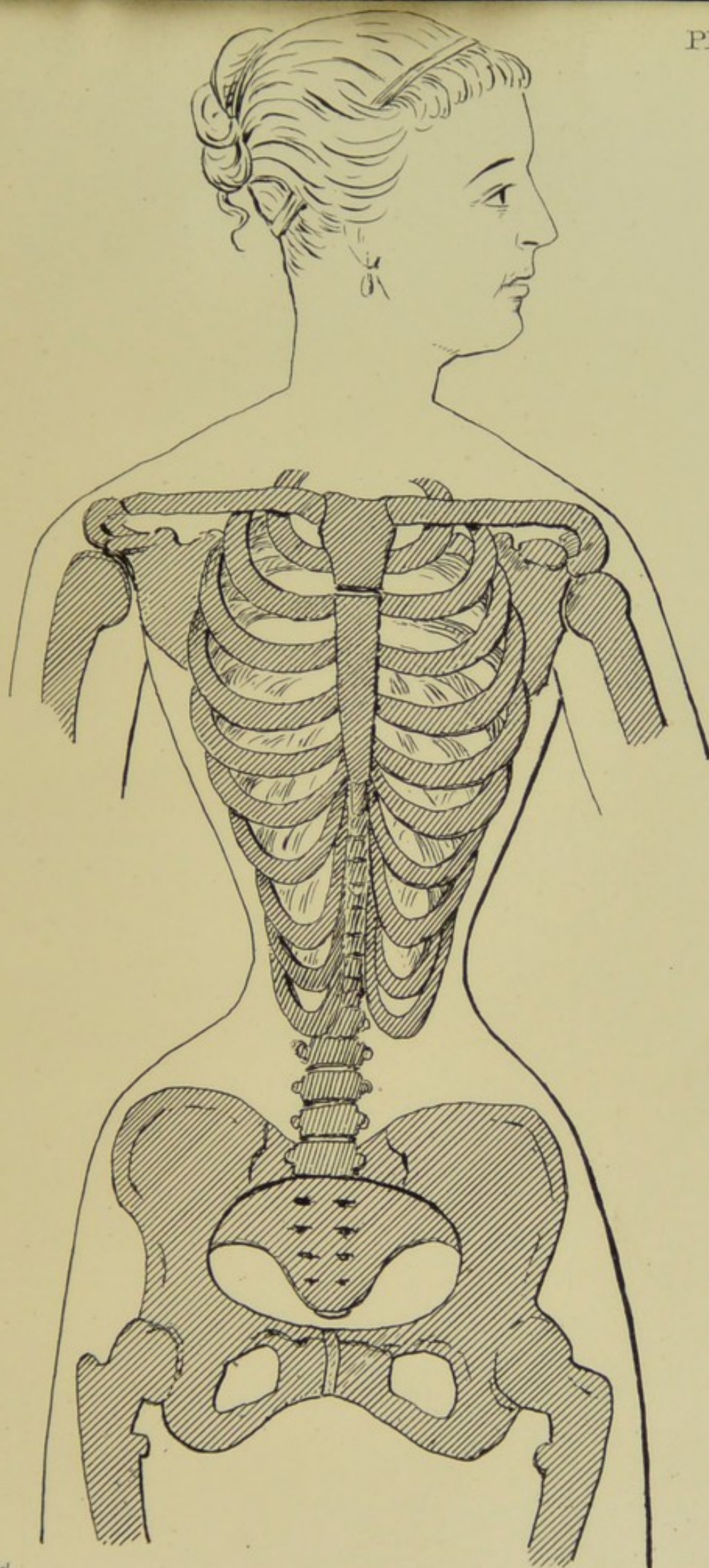
PLATE 7.—The dark line is the outline of a patient's right foot with incipient bunion, &c. The dotted line is the outline of the sole of the boot worn on the same foot ($\frac{3}{4}$ natural size). See text.

PLATE 8.—(A). Healthy foot in a rational boot ($\frac{1}{2}$ natural size). (B). Same sized foot deformed by fashionably-shaped boot ($\frac{1}{2}$ natural size).



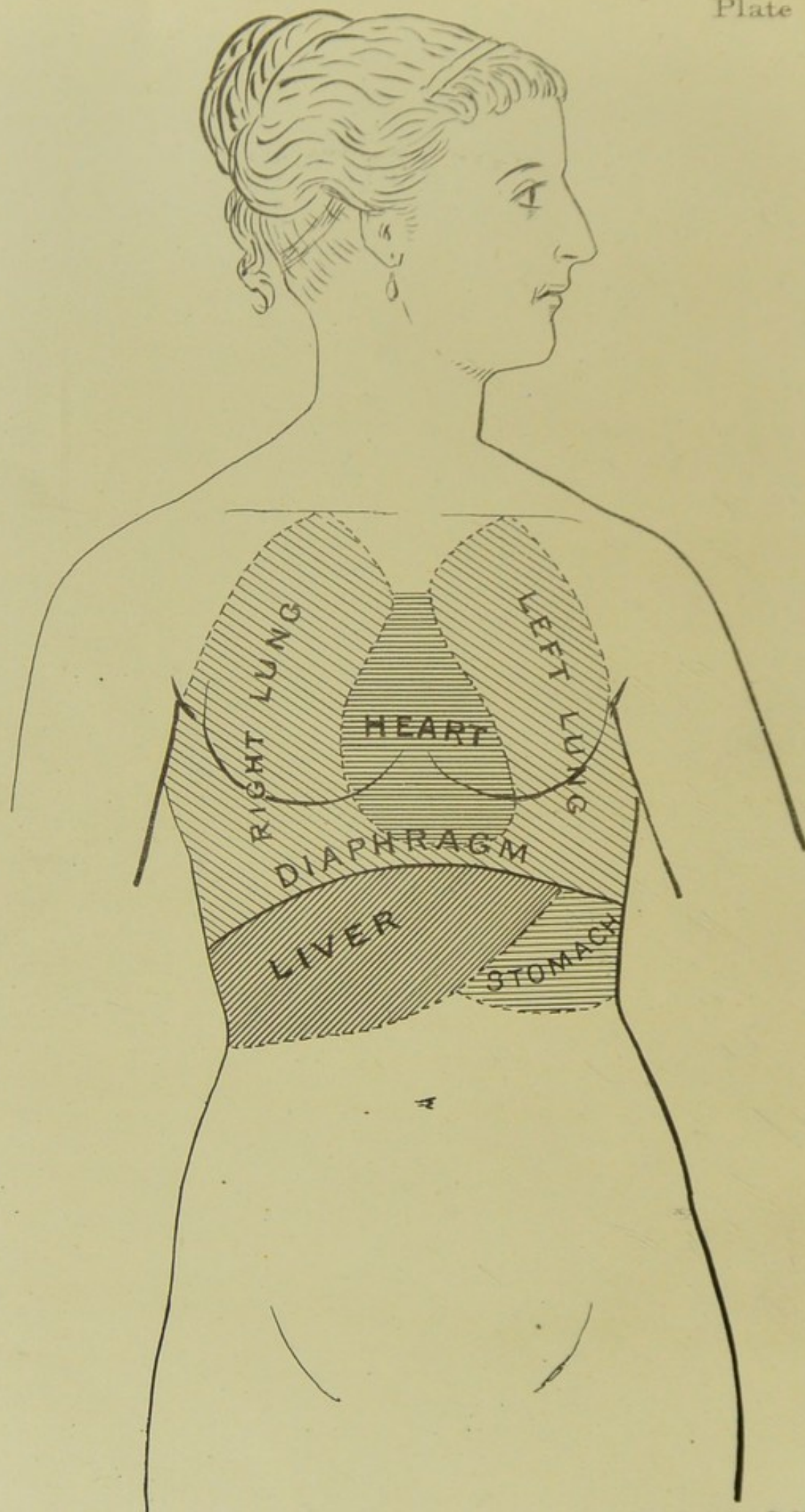


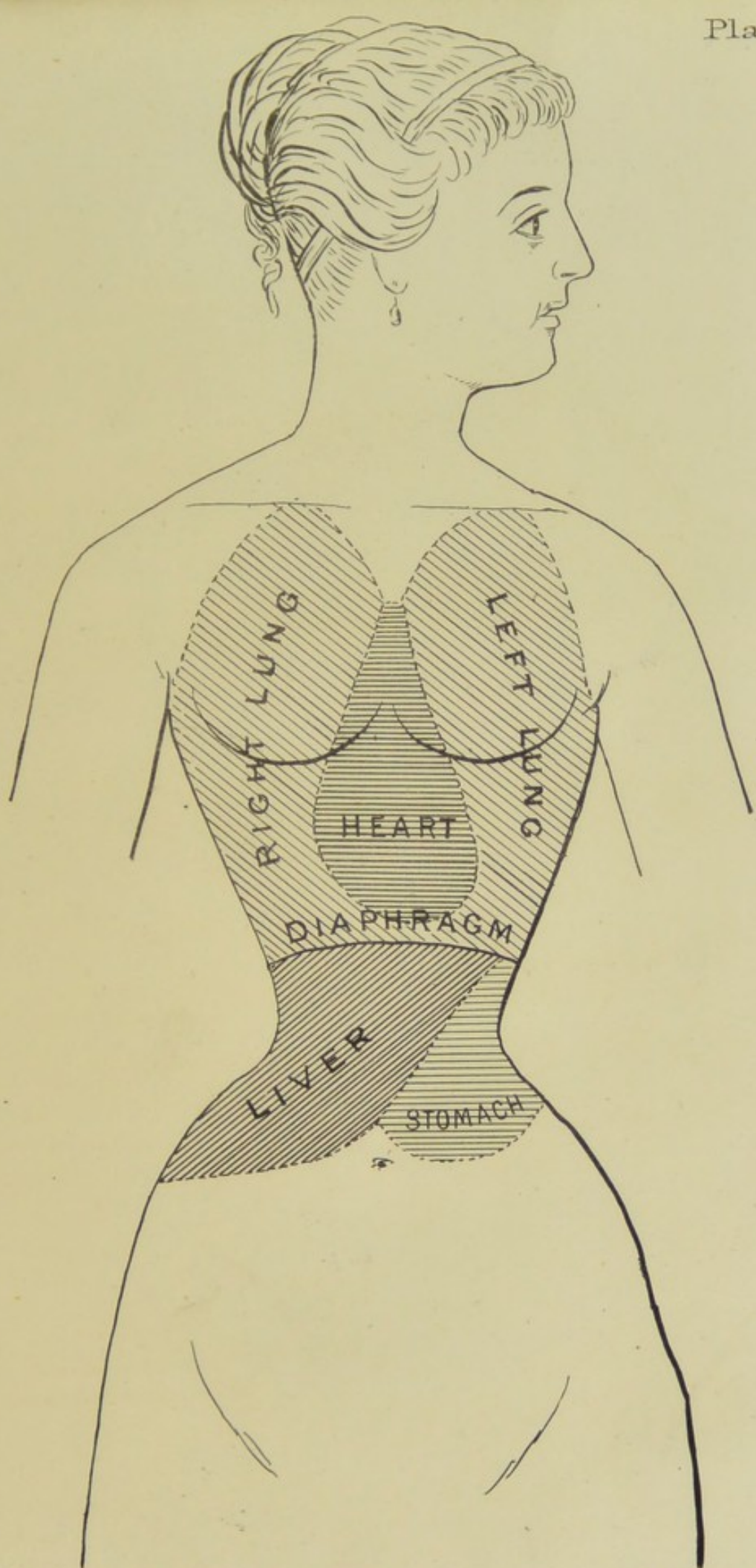




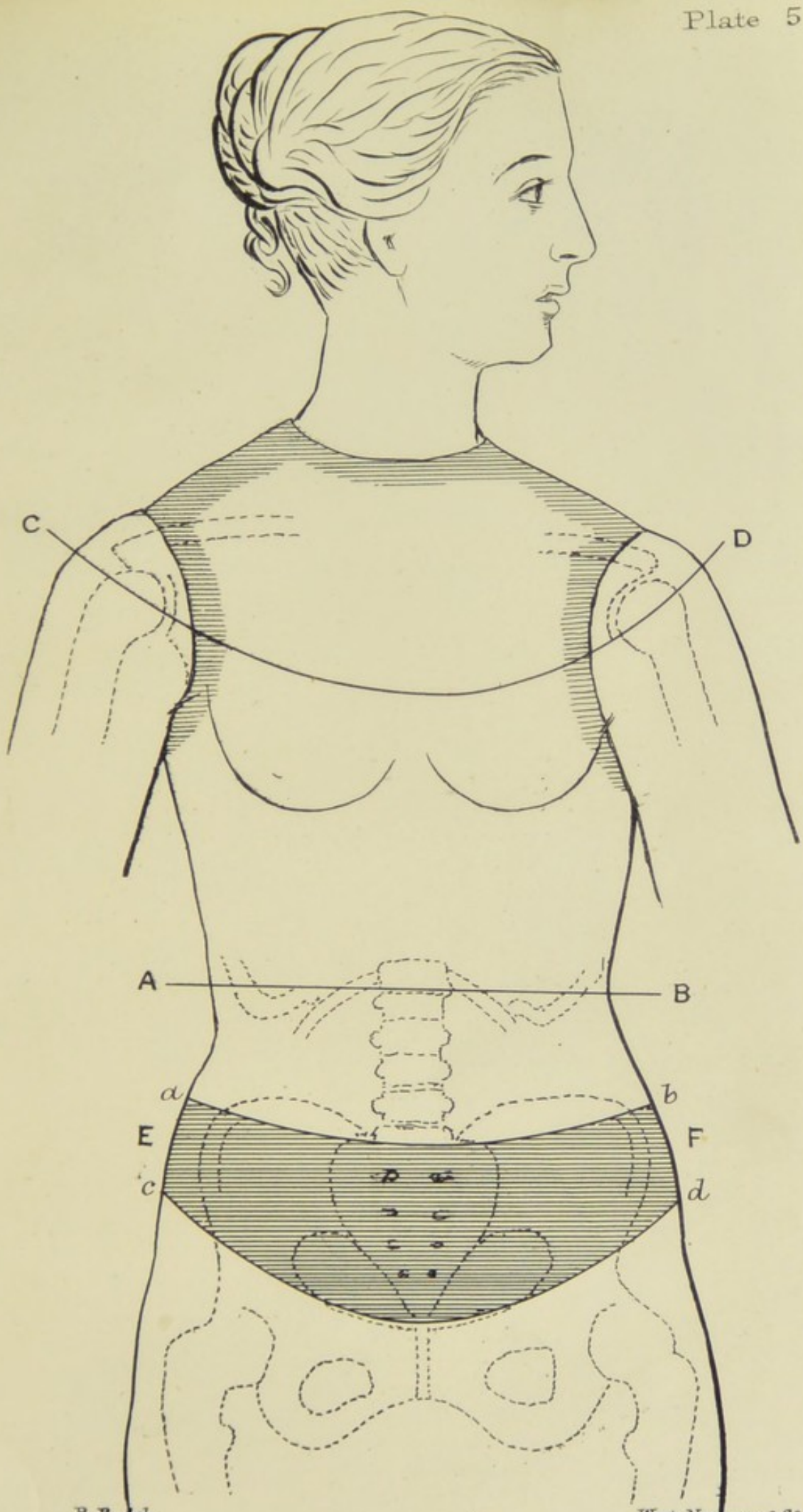




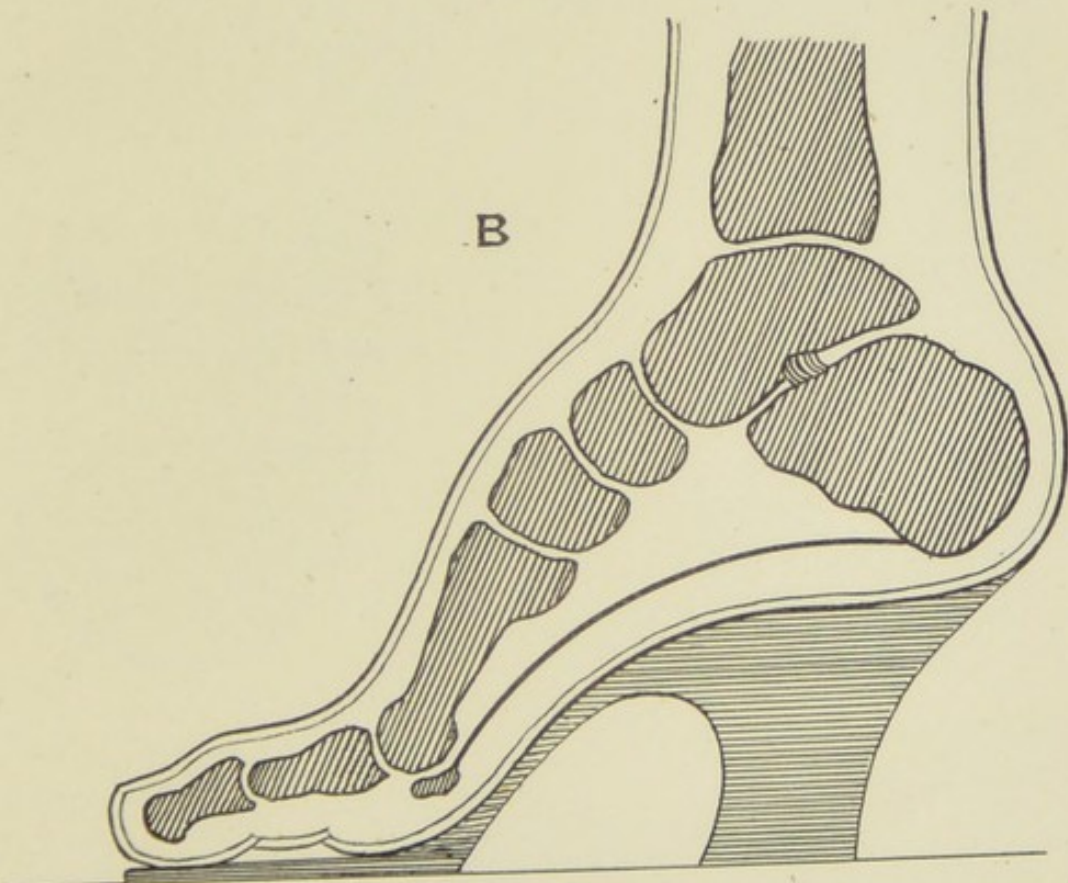
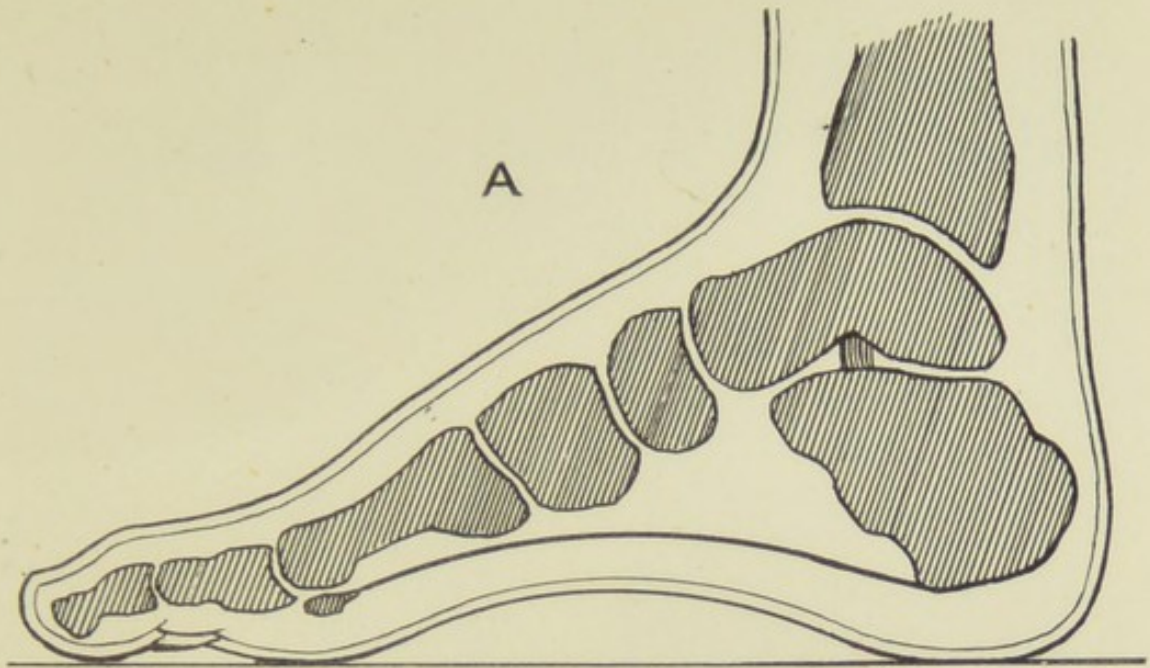






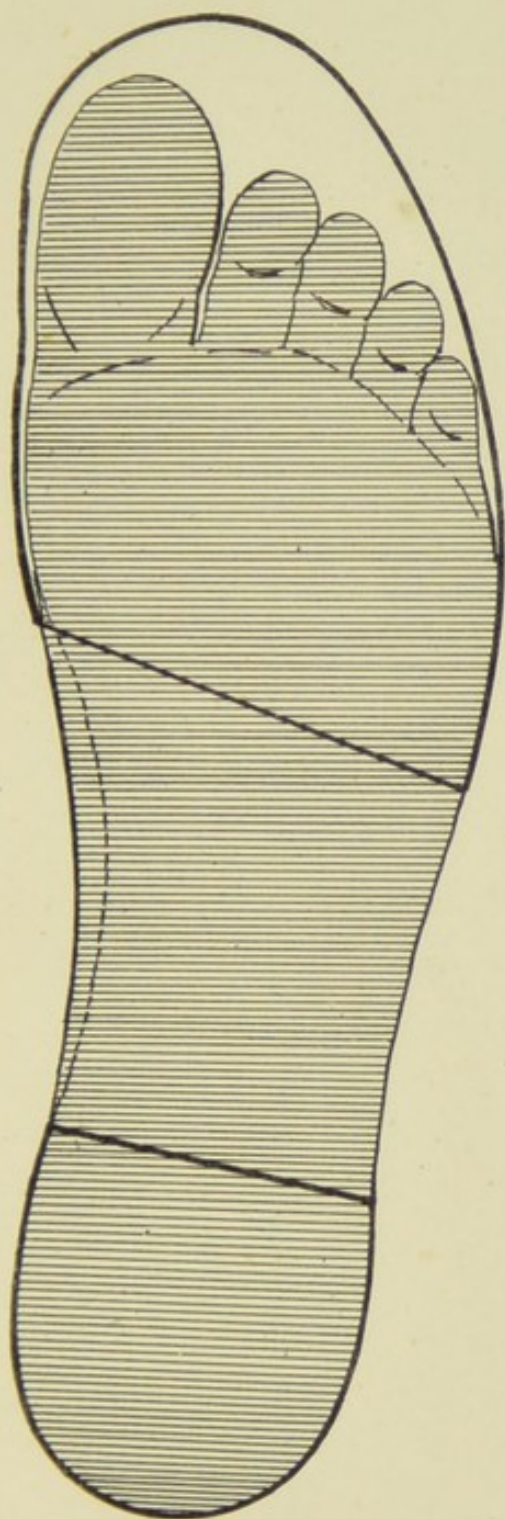








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