

Remarks on the loss of muscular power arising from the ordinary foot-clothing now worn, and on the means required to obviate this loss : being a paper read before the British Association at Cambridge, October, 1862 / by James Dowie.

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REMARKS

ON THE

LOSS OF MUSCULAR POWER

ARISING FROM THE ORDINARY FOOT-CLOTHING
NOW WORN,

AND

ON THE MEANS REQUIRED TO OBVIATE THIS LOSS.

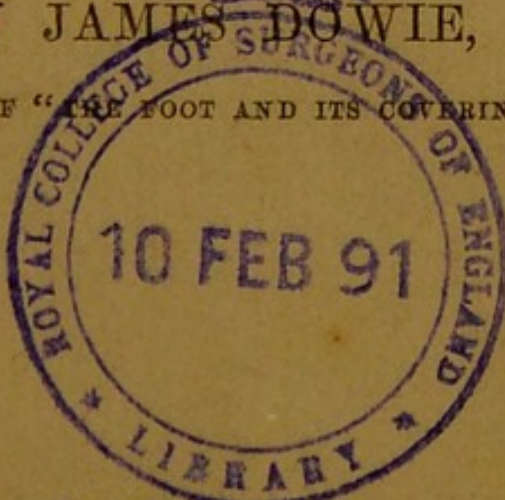
BEING

A PAPER READ BEFORE THE BRITISH ASSOCIATION
AT CAMBRIDGE, OCTOBER, 1862.



BY JAMES DOWIE,

AUTHOR OF "THE FOOT AND ITS COVERING."



LONDON:

ROBERT HARDWICKE, 192, PICCADILLY.

1863.

REMARKS

on the

28 OF MUSKET AIR POWER

FROM THE GUNNERY FOOT-BATTALION

NO. 100

AND

THE RESULTS OF THE EXPERIMENTS

BY

THE GUNNERY FOOT-BATTALION

AT CAMPBELL'S BARRACKS

1857

BY JAMES GUNN

OF THE GUNNERY FOOT-BATTALION

PRINTED

BY JAMES GUNN

1857

NOTICE.

THE following paper was not intended for publication as a pamphlet ; but shortly after it was read at Cambridge, I was applied to by several eminent men for copies, with a view to follow up the inquiry. I have felt it my duty to respond to this request.

JAMES DOWIE.

455, *Strand, London.*

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, HELD AT CAMBRIDGE, OCTOBER, 1862.

(From the *Lancet*.)

A PAPER was now read from Mr. Jas. Dowie, being "Remarks on the Loss of Muscular Power, arising from the ordinary foot-clothing now worn, and on the means required to obviate the loss." A pair of regulation army boots were shown, and a pair with Dowie's improvement, which consisted in their possessing elasticity of the sole in front of the heel, partly through the agency of india-rubber, and in having the proper shape of the foot, thus differing from the army boots, which were straight in the sole and solid throughout. Very much discussion followed, including amongst the speakers, clergymen, physicians, travellers, and others, who gave their experience as to which were the most comfortable boots to wear. The author's improvement was considered a good one by the majority of the speakers.

ON THE LOSS OF MUSCULAR POWER.

THE locomotive function of the human foot and the movements of its several parts are without a parallel in the animal kingdom ; the wonderful mechanism of the whole being so exquisitely adapted to the grand design of the system as justly to command the admiration of all who have examined its anatomy and physiology.

In the following paper on defective muscular development and the loss of muscular power, arising from the foot clothing now generally worn, and on the improvements required in the construction of the same to obviate losses of this kind, the grand object I have in view is, to cultivate by experimental as well as by scientific inquiry a more enlightened acquaintance with the physiology of the human foot and with the manufacture of clothing material, and of a covering, both constructed on scientific principles, harmonising with the functional requirements of the inferior extremities. The want of information that prevails on this subject is very remarkable. I have even had workmen so ignorant as not to know that

there was any material difference between the last on which the boot was made and the foot on which it was to be worn ; and although I feel somewhat bashfully diffident in saying it, it is much to be feared that too many wearers are not much better educated in this respect—the force of fashion diverting from their normal course the *laws of nature*. When fashion is thus allowed capriciously to deform the feet, it evidently indicates a perverted taste on the part of the public ; and perhaps Social Science has no greater difficulty to contend with than to turn the current of fashion into its proper channel in the shoeing of mankind.

The more prominent characteristics of the boots and shoes now commonly worn demanding notice, are—*rigidity of sole from the tread backwards, high heels*, or a greater thickness of sole under the heel than under the tread or metatarsa-phalangeal articulation—the peculiar *curvature* of the sole both longitudinally and laterally, the former technically termed in trade phraseology, “ the spring of the last ” and the goose-toed form of the uppers, as at the period when Dr. Camper wrote his celebrated minor Essay on “ The best form of shoe.”

Into the details of construction of form of these several parts it will be unnecessary to enter, as they must be familiar to all. I shall, therefore, at once proceed to show how they affect the foot in infancy, youth, and manhood generally ; but, for the sake of

perspicuity, I shall take for illustration the feet of children when first shod; those of "the plough-boy," and the feet of our soldiers, policemen, and volunteers, more especially the *soldiers*, because they are selected as free from blemish, but afterwards destroyed by imperfect shoeing. The same course of illustration will be preserved under the subsequent head of improvements to obviate present defects.

The tender feet of children when first shod on the objectionable plan in question sustain a threefold injury;—*first*, the normal development of parts is prevented; *second*, often much neglected before they are laced into boots, rigid under the tarsus, and so pinched at the toes as to deprive the anterior part of the foot also of its natural movements and elasticity, rigidity of structure and deformity are cultivated; and *third*, thus weakened and reduced in strength in every way, the muscles, ligaments, &c., of babies' feet are called upon to perform an extra amount of work in walking. There is something so unreasonable in this, and even unpardonably cruel, as to call for special animadversion, for many a helpless little one is thus lamed for life.

This will appear still more manifest when we come to examine the proper method of shoeing and training at this interesting period.

The English ploughboy, in heavily ironed "high-lows," driving his team in sticky ground with large balls of clay attached to each foot, furnishes an

instructive example to our modern professor of gymnastics. Agricultural labourers form a very large and interesting section of society, and here we have a practical illustration of the physical training of their inferior extremities, satisfactorily accounting for their deformed feet and calfless legs long ago pointed out by Sir Charles Bell. In infancy the legs are disproportionately short as compared with the trunk or body ; and just when they begin to grow rapidly and when every attention is requisite to cultivate muscular development, strong ligaments, and healthy nervous action, we practise the very reverse on the stamping, plodding, but cheery ploughboy. Viewing the agricultural population in a national light, and reflecting how much they are dependent upon muscular strength from the large amount of heavy work which they have to perform, and how much the general public is interested in the timely performance of this work in seed time and harvest, the obvious conclusion forces itself upon our notice that there is involved in this most objectionable system of shoeing youth not only a shortsighted economy, but a serious sacrifice or deterioration of race that demands a thorough investigation by the Royal Agricultural Society and other societies, whose special function is to guide the wheel of progress in matters of this kind. Nor is this loss confined to our rural districts, for the youth of our labouring classes generally are in a similar position with the plough-

boy. Few exciting causes interfere more injuriously with the general health and constitution than the deforming process to which the feet are thus subjected; and there cannot be a doubt that much of the bad health and inability to perform the daily amount of work, and consequent disappointment and losses arising therefrom, are traceable to this source. Even amongst the higher classes who ought to know better, the malformation of the feet and legs at this period of life is in the highest degree reprehensible.

In the example of the soldier, the volunteer, and policeman, the foot has arrived at maturity of growth; so that if the men have been examined, and those only chosen for the public service whose feet are found free from blemish—as is the case, at least, with the former, the regular army—the effect produced by the regulation boot now worn is somewhat different from that of the previous two illustrations. Thus, in the *first* place, the result is now, atrophy of muscle, ligament, nerve, and tissues of the foot generally. In the *second*, deformity as before, but now attended with the long dark catalogue of maladies to which the body is subject in declining life; and *third*, muscular weakness, but now with a growing prostration of strength that annually becomes more and more difficult to recover by rest; while the waste of motive power in progression and the tear and wear of animal mechanism increase in a corresponding ratio. In cases of robust health and strong con-

stitution, the feet and general health of the soldier may fight the daily battle of the regulation boots for a few years, when they enjoy regularly, during the stated periods of rest, time to recover partially their normal strength, but generally speaking, the result is otherwise ; while, with hardly an exception, the feet in active service are the first part of the system that breaks up and gives way before the strong tide of hostilities.

Nor is it surprising that such should be the case. Indeed, the contrary would be so ; for when the feet are thus clothed, the wasting of the girder ligaments of the plantar arch, and the general atrophy of tissue that takes place, must of necessity not only reduce the powers of progression, but also break up the whole mechanical structure of the foot. And this is just what daily experience informs us is the actual case with the British soldier ; for when fighting the battles of his country, the mortality from foot lameness is greater than from any other cause, and the same fatal result is experienced in the armies of all nations thus shod. It is certainly humbling to think, that England should treat her armies thus in the present era of her history, yet such is fact. And this, too, it must be observed, is not the only humbling view of the matter, for the efficiency of the soldier thus shod is greatly reduced, as will subsequently be shown when examining this part of our subject experimentally.

I now enter upon the more agreeable part of my paper — the principles on which the human foot should be clothed. Following the order of illustration formerly adopted, the grand object in infancy is to train the child to stand upright upon the tripod bearings of its feet, so as to cultivate the normal development of the several parts with a view to proper shoeing and the preservation of form as soon as it has thus learned to stand. Children should never be too early shod or even allowed to stand upon their feet; for at this early period of life the bones and every part of the structure are soft and unfit to bear the superincumbent weight of the body, or undue pressure in any direction. Many attribute the going over the shoe to the outside or inside to the imperfect construction of the covering, but this controversial question may soon be disposed of, for very many children go over the heel before they ever wear a shoe.

The physical training of the feet and limbs of infants on the knee, and when they first begin to sprawl about and learn to stand, is thus a very important branch of nursery education, and should never be neglected either by mothers or the family doctor; for when they are so at this period, and deformity established, proper shoeing afterwards is hardly possible. “The proper training of the young sprig” is a cardinal maxim with the gardener; and if this is essentially necessary to success in horticulture, how much more important is the reduction

of the principle to practice in the training of children's feet, and indeed every member of the body when they first begin to grow.

In the case of the ploughboy, the normal development and movements of the several members of the foot must be duly attended to and provided for in the clothing in order to obviate present defects and losses. No doubt, when the ploughman has a large family, the question of expense is one that frequently proves difficult of solution ; and the common conclusion arrived at, that the ploughboy's "high-lows" must serve for twelve months—must be thick, rigid, and heavily ironed to do so—and must not exceed a certain price, at the same time, are all items that exclusively belong to one side of the balance sheet ; and, therefore, are insufficient to prove the soundness of this conclusion ; for when we examine the other side, and sum up the losses arising from imperfect development, weakness, extra tear and wear of muscle, reduced standard of health and amount of work done, they evidently do more than turn the balance the other way. But this is not the right view of the ploughboy's case ; for the practical solution of the question of expense resolves itself into one of two things—either that by proper shoeing and physical training he will be able to gain two pairs of "high-lows" more easily than he now gains one ; or else that "high-lows" may be constructed on principles so as to provide for the requirements

of the foot, and yet last longer and be found cheaper in the end than the thick rigid ones now worn.

Under the next head of a suitable covering for the full grown foot, we shall confine our remarks to the case of the soldier for reasons already given. And here the only doctrine that can reasonably be taught is, that when recruits enter the public service with sound feet, the public ought to provide regulation boots that will preserve them in this efficient state of health. This is no less the duty than the interest of the Government, so that when officials advocate otherwise, either they have some ulterior object in view that cannot be brought into daylight, or else they are unqualified for the office they hold. No doubt the pecuniary question of expense is no secondary one in the clothing department of the public service ; but the difference between the price of the regulation boots now worn and that of efficient foot gear capable of preserving the feet in health and strength, can never be placed in the scales ; for to this difference another must be added, viz., the difference between the cost of work done by lame soldiers unfit for duty, including the extra expense of the medical and conveyance departments, and that done by healthy active soldiers always at their post in the day and hour of their country's danger. In point of fact, practically considered between the two, no just comparison can be drawn, for a lame soldier is tenfold worse than no soldier at all. And

exactly the same thing may be said of the volunteer and policeman.

But the pecuniary question under consideration is susceptible of another and a more satisfactory solution. This is more especially the case when it is examined as a public one in the light of economy ; for the prime cost of a thing, apart altogether from its intrinsic value, can never be separately estimated under such a view from its durability. Now, if proper foot clothing last the soldier, volunteer, and policeman, longer than what they now wear, the former may be cheaper in the end than the latter ; and we have no hesitation in saying that experimental evidence is forthcoming in favour of this solution, as will immediately be shown. In this respect, therefore, the public balance-sheet will shortly rectify itself on the same commercial principle that all private balance-sheets generally do.

I now come to the last and not the least important and interesting division of my subject :—its experimental investigation, and how such is practically being done. The physical training movement has proved itself a complete success in the estimation of the British public—much more so than it did in the days of ancient Greece and Rome, because more scientifically prosecuted—and our modern professors of gymnastics will soon experience no difficulty in settling the question of how the human foot should be clothed. Indeed, the problem is already fast being

solved in accordance with the writings of Sir Charles Bell and Sir Benjamin Brodie ; for the moment the wasted and distorted muscles and ligaments of the foot are liberated from the thraldom of rigid leather, they slowly regain their normal symmetry and functions. The neglected child walks straight upon the tripod bearings of its feet ; the rapidly growing limbs of youth no longer resemble drumsticks, but exhibit finely developed calves and thighs ; while the feet of others in the prime of life, and even when well advanced in years, are like the eagle renewing their age, and all this through the instrumentality of physical training. And this, too, is not all, for experiments are now being made to ascertain the retarding force which the regulation boot of the army applies to the heel of the soldier in marching, which is found to be several pounds ! In other words, it takes 28 lb. to bend the army regulation boot exhibited, while 2 lb. bend another constructed on principles adapted to the locomotive function of the heel and instep and the physical training of the foot generally ; so that there is a difference of 26 lb. against the former and in favour of the latter. Thus, a soldier in his regulation boots is compelled to carry something like an equivalent to 26 lb. attached to each heel more than those who wear the boots that are constructed on sound principles, and these data are equally applicable to volunteers and policemen. A contrast so strikingly anomalous obviously calls for practical inquiry ; for

weights thus attached to the heels of British soldiers and volunteers, when called upon to charge the enemy, could never be intended to increase the efficiency of the former, but the contrary, to ensure the triumph of the latter; while to render such doubly sure, the muscular strength of the feet of the soldier and volunteer is greatly reduced by atrophy prior to making the charge! As to weights purposely attached to the heels of the policeman when the hue and cry of "catch thief" is raised, the proposition, if it were not matter of fact, is too ludicrously absurd to be seriously entertained in the present era of progress; yet such is really matter of fact, experimentally ascertained. As already hinted, it is certainly high time the professor of gymnastics was professionally engaged in these several departments of the public service.

As to the practice now in daily operation of clothing the human foot, so as to promote the physical training of its several locomotive members as referred to above, it has for long been successfully followed by myself; and I shall allow the facts of the case briefly to speak for themselves, as specimens of the outer and inner coverings are both present, while thousands of them have been worn for many years by men of the highest rank and scientific attainments, some of whom reside in Cambridge and may be now present—men who are qualified to judge for themselves, and therefore would not be imposed upon either as to intrinsic or pecuniary value. From

their elasticity and freedom of wear, there being no grinding action on the ground or overstretching of the uppers, they prove themselves more durable and cheaper than the ordinary boots. While injured feet in every age of life have been and are being restored to health and usefulness, I shall only further add under this head that there is now no patent on the boots ; and it will afford me great pleasure to see the principle taken up by the trade generally in Cambridge and every other place, so as to give the public the full benefit of their use, which is very warmly recommended by the medical profession and those practically interested in the physical training and volunteer movements ; and it only remains for me to point out the *modus operandi* as to how distorted feet are restored to their natural state, and healthy ones preserved as such.

That which chiefly distinguishes these boots from the ordinary ones, is the construction of the sole under the instep, thereby giving this most important part of the foot free play. It not only does so, but it also sets free the heel bearing, and the two metatarsa-phalangial bearings (the ball of the great toe and the ball of the little toe), thus allowing them to perform their respective functions in a manner not enjoyed in the rigid soled boot. It is not very easy explaining within the scope of a paper of this kind the beautiful mechanism of the instep, and how it adapts itself by its universal hinge joint movement to the tripod bearings of the foot just mentioned ; but

when we examine the movements of the nude foot, it will be readily understood that the three do not move in the same horizontal plane or remain equidistant from each other in walking. We shall thus perceive that in the ordinary boot there is here a natural law violated in several respects, but that in the other the demands of this law are complied with, comparatively speaking, the longitudinal and lateral elasticity of the arch of the foot being preserved.

Again, you will observe that in the one boot where the three bearings are rigidly fixed, the toes turn up ; but in the other they are straight, as is the case with the nude foot when resting on the ground ; while the heel easily bends upwards, thus complying with the natural movement of the foot and its tripod bearings. Were the sole of the former not turned up but made straight, it could not be worn ; the curved form of sole, however, enables the wearer to rock from heel to toe, and from foot to foot, with a jolting action.

Now, the consequences of this are soon told, for the padding of the ball of the great toe and little toe is overstretched, owing to the toes being turned up ; so that by this jolting action abrasion takes place, hence the calosities and abnormal thickening of the padding and other painful deformities experienced. In the other boot, when the foot touches the ground, the toes and padding of the anterior bearings are in their natural position, so that they suffer no harm ; and the reason why feet that have

been in the former or rigid boots are restored to health when put into the latter, is the normal freedom of movements which they enjoy—the several parts being allowed and even called upon to perform their respective functions. All abnormal matter is thus removed according to the natural law of the tear and wear of the system generally; while a healthy reparative process commences which gradually restores the several parts to their normal state of health and usefulness—the whole of this salutary work being done in accordance with the principles involved in the physical training of every member of the body.

Such are the few observations I have ventured to make on the subject which heads my paper, as “The British and Foreign Medico-Chirurgical Review” of July last justly remarks: “The great error in all boots and shoes made upon the system now in vogue in all parts of the civilized world is, that they are constructed upon a principle of bilateral symmetry.” No little difficulty will be experienced in getting out of this error, as the whole of the labour in last-making is not only now organized to turn out lasts of this form, but it is also naturally and more easily performed, while it is also natural for the working shoemaker to form his shoes on the same erroneous principle.

It is an error, too, natural for fashion to patronise, and for an unthinking public to follow, just because of its “bilateral symmetry.” But a far greater

error than this exists in the construction of boots with high heels, a rigid waist, and curved sole ; thus depriving the instep and the tripod bearings of the foot of their respective normal functions ; for in doing so we not only distort the foot but transfer the function of the muscles of the calf of the leg to those of the pelvic region, thus sacrificing the economy of muscular power and the dignified elegance of erect human progression, interfering at the same time most injuriously with the lumbar region and the general health of the body. The removal, therefore, of bilateral symmetry, however necessary, would only effect but a very small and fractional part of the great work of reformation required in the proper shoeing of man. Practically speaking, it would effect almost none of the reformatory work at all—for, as we have shown, if the interior of the boot corresponded to the exact form of the foot, the anterior part or toe being straight instead of curved upwards, the wearer of such a boot could not walk ; and if the toes are turned up in the boot so as to correspond to the “spring of the last,” then the metatarsa-phalangeal articulations, and the two anterior bearings at the balls of the great toe and little toe, suffer the most afflicting and painful injury the foot sustains. Many who have got their boots made according to the form recommended by Dr. Meyer in his work, “Why the Shoe Pinches,” have experienced the soundness of the above conclusion and have since come to me and acknowledged they were rather worse than better,

the toes although relieved at the points being more painfully pinched at the roots than before. In the physical training of the foot, its beautiful machinery, like all other mechanical systems, must be studied as a whole, from a physiological point of view, before practical success can be attained. This is the keystone of the arch; and, like the keystone of the plantar-arch itself with its girder ligaments, it must be thoroughly understood both as to form and function by its owner before we can expect to see suitable provision made for it. In other words, people must make themselves acquainted not only with outward form, but also with the internal mechanism of their feet and the specific function the several parts have to perform, before they can expect to arrive at a satisfactory conclusion as to how they should be provided for in the clothing, and the loss of health and strength they sustain by wearing foot gear constructed on erroneous principles.

It is evident, therefore, that the manufacture of lasts, boot-trees, and shoeing material on sound principles, and a covering adapted to the locomotive functions of the human foot, are questions not unworthy of public consideration at the present time, and of the professional investigation of scientific institutions, educational seminaries, and national seats of learning—such as Cambridge.

With Illustrations, price 2s. 6d.

DEDICATED BY PERMISSION TO SIR B. C. BRODIE, BART.,
PRESIDENT OF THE ROYAL SOCIETY, AND SERGEANT-
SURGEON TO THE QUEEN.

THE FOOT AND ITS COVERING.

BY JAMES DOWIE.

"Is the proper conservation of the natural form and functions of so valuable a portion of the human frame as the foot not a worthy subject of consideration for the philanthropist and medical man? Is it not a strange reflection, so far are the feet of all persons in our own country and time deformed by the voluntary and unnecessary adoption of an improper form of covering, that in Europe from the antique alone any knowledge of what is beautiful in the adult human foot can be derived.

" 'We bestow reasonable compassion upon the fate of the Chinese women, who dislocate their feet in obedience to the dictates of a barbarous custom, and yet we ourselves have submitted complacently for ages to tortures no less cruel.' So the Dutch anatomist wrote a century ago, and it is said by one of our present authors (Dowie), '*that the boots and shoes of the present day are even, if possible, more objectionable than those of the time when Camper wrote upon the subject.*' And are these statements exaggerated? We think not.

"We are much indebted to Mr. Dowie for bringing before the English public the philosophical essay of Camper, which contains many valuable suggestions. —*Medico-Chirurgical Review.*

"THIS work is not of a strictly professional character, but we feel bound to notice it—albeit the production of an enthusiastic disciple of St. Crispin—on account of the practical importance of the subject of which he treats both to the profession and the public. '*Ne sutor ultra crepidam*' is a time-honoured adage; but who so fitted to expatiate upon the last as the cobbler who sticks to it? and Mr. Dowie has evidently done so with all his might, not forgetting, however, as is too often done, the difference between a highly elastic bony arch and a rigid piece of wood. Camper's essay on 'The Best Form of Shoe' enters at length into the anatomical details of the foot, and the method in which progression is effected, showing that the foot both lengthens and expands every time it touches the ground, and therefore that a shoe to be suitable must make proper allowance for the consequent change of form.

"Mr. Dowie gives some information and hints which may be of service to most medical practitioners, and specially to those who have charge of men whose efficiency must depend in great part on their powers of progression—viz., soldiers and police. To all pedestrians it must be an object to have an easy shoe, and in the present day of universal military ardour and hebdomadal marchings out, this little contribution may prove a useful adviser upon the subject."—*Lancet.*

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"THIS is a sensible book, published with an earnest purpose, to which it is impossible to say '*Ne sutor altra crepidam*;' for Mr. Dowie, having informed himself 'where the shoe pinches,' has certainly gone the right way to work to point out to others the best means towards a practical and permanent remedy."—*Bell's Weekly Messenger*.

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"IT is written in a plain, intellectual, but very comprehensive manner, so that everybody can consult it with ease and advantage."—*Court Journal*.

"IT is an application of anatomy to shoemaking, and contains a vast amount of interesting information on both subjects."—*Critic*.

"THE anatomy of the foot is detailed with great minuteness."—*Dispatch*.

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"MR. DOWIE deserves the gratitude of all those who possess the usual pedal appendages for the efforts he has made to release them from the '*peine forte et dure*,' in which they are so often held, and to place the covering of the foot in its proper light."—*Globe and Traveller*.

"FOR five-and-forty years Mr. Dowie has followed the trade of a shoemaker, and during two-thirds of that period he has been putting an unusual share of healthy science into his work. With no pretence to literary merit, he has written an instructive book upon a subject well worthy of attention."—*Examiner*.

"MR. DOWIE has done good service in his generation by calling public attention to the true principles which govern the art of shoemaking. We place the shoe—the 'foot fixing' as the Yankees call it—in the very first place of the volunteer's equipment; with a good one he is an alert, active soldier; with a bad one he cannot be: he is disabled with a worse impediment than pounds of weight added to his feet."—*Volunteer Service Gazette*.

"WHAT, then, do we not owe to the author of this work, who treats on the economy of the foot scientifically, and shows us not only how to cure a corn, but how to prevent it? His book should be read by the whole body of shoemakers; and we don't know whether there ought not to be a regular cordwainer's chair attached to our colleges to teach the sons of Crispin the anatomy of the foot, and the proper way to form its covering so as to secure safety and ease."—*Mark Lane Express*.

"THE volume before us will, we doubt not, be read with pleasure by every one who wears boots and shoes, and no one will read it without deriving both profit and amusement."—*Mining Journal*.

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"WE have read this book with great interest. It is anatomical, philosophical, and practical; and to all who are desirous of understanding the construction, functions, and claims of the human foot it offers sound and solid information."—*Sunday Times*.

"HERE are rules, reasons, and principles which are of essential service to every person who wears shoes, and who wishes to do so with ease and comfort. Mr. Dowie's book will be a text book on the subject to all future time."—*Wesleyan Times*.

"ONCE fairly started in the track of investigation, Mr. Dowie followed up the subject with that unwavering patient perseverance which is the most essential quality of genius. How much the want of proper attention to the healthy condition of the foot gradually undermines the health of mind and body is well described, and points out the duty of parents and guardians of youth to give proper attention to this essential element of physical well-being upon which success in life so very much depends."—*St. James's Chronicle*.

"MR. DOWIE in his work recognizes the principle of making the sole of the shoe correspond to the shape of the foot; but his great claim to be considered a reformer consists in his introduction of a piece of elasticated leather into the middle of the sole of the boot or shoe. By this simple and ingenious contrivance, he gives to a thick soled boot or shoe all the flexibility of a slipper, and the foot in walking retains all its natural springiness. None but those who have tried them can form a notion of the comfort and pleasure it is to walk in thick soled boots, constructed on Mr. Dowie's principle, after having been accustomed to wear the ordinary stiff-soled shoes."—*The British Journal of Homœopathy*.



