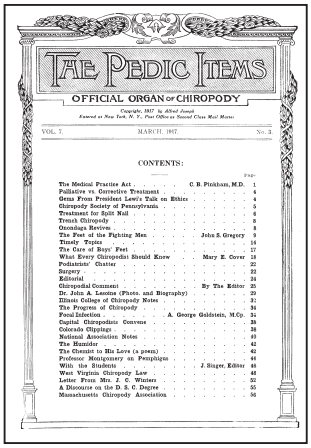
The Pedic Items, March 1917

The Feet of the Fighting Men

John S. Gregory*


THE PEDIC ITEMS

OFFICIAL ORGAN OF CHIROPODY

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VOL. 7. MARCH, 1917. No. 3.

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Cover of March 1917 Issue

This article, written toward the end of the Great War (World War I), is an interesting exposition of one military surgeon's goal of ensuring that the "feet of the fighting men" of the United States Army were fit for the soldiers' missions.

After years of studying European and American military footwear and the foot problems encountered in peacetime training and during wartime, Maj. William W. Reno of the US Army Medical Corps devised a system of foot inspections to ensure that military footwear was available that corresponded to the various foot types found in the population, ending the problem of ill-fitting footwear that had plagued the troops. Major Reno's foot-inspection system resulted in a precise "prescription" for the troops' footwear. After "foot screening" all of the enlisted troops under his command, he reported interesting demographic information: for example, the average size of a soldier's foot in the early 1900s was "7E," and among 1,087 soldiers inspected, only 290 "normal" feet were found. For the first time in military medicine, soldiers found to have "bad" feet were placed in separate squads and had to "exercise" according to Major Reno's instructions in order to eventually rejoin the regular units. The common foot problems of "corns," "bunions," "ingrowing nails," "exostoses," and "pronation" were documented, with the prime cause reported to be "ill-fitted shoes."

Major Reno knew that an army "moves on its feet," and his visionary approach to documenting foot problems and prescribing well-fitting shoes and boots greatly advanced the foot health of the US Army for generations to come.

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Reprinted from *The Pedic Items* 7(3): 9–12, March 1917.

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THE FEET OF THE FIGHTING MEN

John S. Gregory

The old saw about an army moving on its belly is all wrong. An army, horse, foot, and guns, moves on its feet. It is a matter of tires and iron-shod hoofs and socks and shoes. But we will narrow the discussion here to the feet of the fighting men, the infantry, which forms the bulk of all armies.

If the army's feet are not sound it doesn't move far and it can't move fast. And that is why, in the medical corps and in the quartermaster's division, you will find a disproportionate amount of official solicitude about feet as compared to legs or hands or even heads. This concern is the same in all armies; and we are profiting by the trials and the mistakes taught us by the millions of weary feet which have followed the roads of Europe into battle. An infantryman will advance a day or retreat two days without food sometimes but he won't advance on sore feet. Motor lorries will be loaded up with him going to the front, and ambulances lugging him away to the rear.

In the early weeks of the militia concentration on the Texan border, practice marches developed physical unfitness in nearly every command. On short hikes of no more than six or ten miles a very large percentage of men fell out, to be gathered up by motor trucks and brought into camp or harvested by ambulances back to hospitals. These men fell out for a variety of reasons, but a great many of them refused to march any further on account of sore feet. To begin with, marching and walking—as the average civilian, not a policeman or a postman, understands walking about his daily vocation—are two very different things. An infantryman on his feet carries about sixty pounds of dead weight; forty-five-pounds or so of pack, eight pounds or so of rifle, and the rest in ammunition or separate equipment. He cannot choose his own gait, and he has to negotiate all kinds of ground, winter roads corrugated with frozen ruts, slippery trails of mud and water, rocks, hot sand. And more than half the time a change of shoes is for him a luxury; he is very apt to keep the same pair on night and day, wet or dry. If his shoes are not right, or if his feet are not sound, he cannot last a week with a moving command; and it is entirely possible that he will even have trouble in a trench.

It was easy to account for a great many militia sore feet early in the summer. The machinery of the War Department ground slowly, and many regiments turned up in all kinds of quaint footwear made to be sat in or briefly stood in, but never to be hiked in over the rough gumbo of Texas. There were patent leathers, boots, button, kid-top boots, low shoes with pointed toes and wide verandas running round them, sneakers, Congress gaiters, and "college shoes for college men," all bravely kicking up the dust or squeegeeing through the mud- hay-foot-straw-foot, along the border. No wonder Illinois fell out by their 20 per cent., or Virginia lay down in companies. No wonder New York lost ninety men by the roadside in six miles. Some of it was sun, some of it was faint heart; most of it was feet.

In those early weeks the trouble was due to no serious attempt at scientific shoeing at all. But as late as November a brigade formed of regiments from the District of Columbia, Mississippi, and West Virginia, after nearly five months spent in active duty at their state and border camps, made a three-days' hike of only thirty-six miles from Fort Houston to Landa Park, Texas. "Scores of the militiamen," the report goes, "reached here in ambulances as a result of foot trouble." Every one of these militiamen in the ambulances was wearing a pair of regulation shoes issued according to the old mechanical requisition on the Quartermaster's Stores. The difficulty in this case was due to imperfect inspection and inaccurate requisition, a combination of bad system and misuse of good material.

In those days arose upon the border a prophet, an apostle to the weary and heavy laden. His name was Major William W. Reno, Medical Corps, U.S.A., and he had a voice crying in the Texan wilderness, saying, "They shall run and not be weary; they shall walk and not faint." Major Reno makes a profession of keeping the United States Army on its feet. With him it is more than a profession; it is almost a religion·

Out of the experience of many years devoted to the study of pedal extremities he devised a system of inspection with a consequent form of requisition on the Quartermaster's supply of shoes and socks. Army orders were issued which established that system for the regulars and for the organized militia in service. Under this established system, during the last six months, Major Reno has inspected 250,000 feet —not pairs of feet—and prescribed for them with a refinement which goes to the sixteenth of an inch.

Major Reno will tell you that barefoot and sandal-wearing races are and always have been better marchers than the shoe-wearing peoples. The Plains Indians of Arizona and of Mexico will go all day, and day after day, over hot sands and rocks without any punishment. The Indians of Mexico are longer hikers on foot than they are mounted. Military history is full of instances which support this very natural fact. One of the penalties of civilization is decreased marching and walking power. We sit more and stand less than our ancestors did, and almost any kind of a shoe, short of a moccasin, limits the freedom of our feet and in time necessarily causes atrophy of certain foot muscles. The normal foot—the foot of a young child, of an Arab, the foot which earns the living of a bare-legged dancer—like Maude Allen or Ruth St. Denis—is very flexible. Great freedom of action is needed in walking, running, jumping, dancing, marching. The large joints of the foot must be free to act. The grasp of the toes against the ground and the backward push of the great toe are of value in every single running or dancing or marching step. The longitudinal and transverse arches must have room to contract or expand in balancing the shifting weight of the body. The 100-per-cent. foot ought to be almost as flexible and sensitive as a hand, instead of the inflexible thing that generations of sitting and bowing to the dictates of fashion have made it.

But there is no use rebelling against the shoe. The shoe in its various manifestations has come to stay. Its great disadvantage in walking or in marching comes not so much from the fact that it is a shoe as that, from childhood to old age, the average person never wears properly fitting shoes. Consequently, by the time a man is of military age his feet have become so deformed and twisted away from natural lines of supple usefulness that great marching capacity is well-nigh a physical impossibility. The wonder is not that marching infantrymen fall out by scores but that with our imperfect footgear and haphazard fitting of man and shoe we have such good records. In 1911 a whole division in heavy marching order covered twenty-eight miles in a little less than twelve hours at San Antonio, and several times during the manoeuvres of last October and November on the Mexican border this record was exceeded by smaller troops.

Those marches were all made in the regulation United States Army shoe. In normal times the War Department issues shoes from its main supply depots at the rate of 1,000 pairs a day. It carries more than a half million pairs in stock. In the early weeks of the concentration the difficulty in filling requisitions was not so much a matter of shortage in stock as of the physical impossibility of issuing and transporting the material fast enough from one or two main depots to keep pace with the enormously increased demand.

The present United States Army shoe is the result of all the European contracts which have been filled in this country. It corresponds most closely to the French and Belgian military shoe. It is a laced shoe of partial Blucher pattern, coming up just over the ankle bone, by contrast to the unlaced, wide topped boot, worn by the German infantry regiments and familiar to every one who has at all carefully observed the photographs of the Great War. Until very recently our army shoe was made of russet leather, smooth side out. That type is still regulation for garrison wear. But the Mexican operations have afforded just the test which our commissary department needed to back up the European war orders. They proved the old shoe, although correct in last, much too light for heavy service. Accordingly in July the War Department began turning out shoes which combine the remote lessons of the European War with the immediate needs of the Mexican service. The leather was used smooth side in with no lining, the rough, undressed leather outside to be soaked in oil before use. The heavy soles were kept supple but shod with hobnails and steel heel rims like a horse-shoe. Where a photograph taken somewhere in France shows a French soldier fallen forward on his face as though in prayer—the way an advancing infantryman will always fall when shot dead—you will see an exact illustration of this shoe pathetically turned up to the sky.

These army shoes are carried in nine-

ty different sizes, ranging from an almost Chinese 4½A to a 14½EE, which sounds like a moderate form of elephantiasis. In July, orders were placed with New England manufacturers for about 250,000 pairs of them, and now they are being issued at the rate of 1,000 pairs a day. It ought not to be hard to fit any normal biped out of such a stock. But left to themselves the men will not order their right sizes. Neither will most of the rest of us, men or women, order the right size or the right kind of a shoe.

Ninety per cent. of people in civil life wear shoes which do not fit them. Listen to some of the letters which Major Reno received from shoe manufacturers during his foot crusade.

"The man who will buy purely anatomical shoes," writes one manufacturer, "is the man who has arrived at years of maturity and discretion, but he is not the fellow who creates volume in shoe manufacture. The fellow we have to cater for today is the young man who buys a pair of shoes because they are the latest thing, who will wear them a couple of months until they are a bit shabby, and then buy another pair. The dictates of fashion in this respect run in waves, and we find that in going after the faddish stuff we have to change the type of our lasts about every six months and the patterns to match."

Another manufacturer writes: "The difficulty in building shoes along anatomical lines is not usually a difficulty of manufacture, and is not due to manufacturers not knowing what constitutes at least some of the principles of anatomical footwear. But it has been amply proven in our case that the public does not want, at least in any great number, shoes so made. To be successful in the shoe-manufacturing game you have got to give the public what they want and not what you think they ought to have."

Now the Army is really not far removed from the public, and the militia is simply a part of the public temporarily in uniform and subject to the same kind of vanity which aroused the British surgeon's ire against Terence Mulvaney. The big contribution of Major Reno's new system is that it does not leave this basic ingredient in military efficiency to the vanity or the carelessness of an enlisted man; it is now a matter of exact prescription carried out by formal order.

Every enlisted man in the Regular Army, which now includes, so far as these regulations are concerned, the organized militia in the service of the United States, has a clothing allowance of $48 for the first year of his term, with a subsequent allowance of $24 for each succeeding year. Out of this allowance he can easily, and must, clothe himself. A careful soldier can save money out of this sum.

In this allowance schedule the army shoe was listed last year at $2.88 a pair, which represented the average cost price of all War Department shoe contracts up to 1915. This year, due to the increased expense of leather and manufacture, the army shoe costs a dollar more a pair. Some men wear out two pairs every year; other men wear out six pairs. Major Reno's new system makes it impossible for the enlisted man to draw anything but his scientifically correct size of a shoe and sock—for a wrinkle in a sock or a size too small will defeat the purpose of the most accurate shoe. Every man on the border now files his inspection blank with his requisition for shoes as though he were going to a drug store with a doctor's prescription.

It is both impressive and amusing to watch Major Reno's system at work. The men are inspected, a battalion or a regiment at a time. On the day for the inspection they all line up in single file, standing with freshly washed feet, sockless, the head of the column feeding into the field hospital tent where the examinations are made. There, five at a time, they step barefooted on to as many wooden stands, placing their feet over big black patterns, on which the examiners quickly trace the outlines with their metal styluses, and then by a quick but thorough examination record the condition of each foot examined. At an adjoining table a recorder keeps tab of the number of the tracing and adds to it the specifications called out by the examiner.

The whole thing runs like a Ford factory: the long khaki line disappears patiently and steadily into one end of the tent, jumps for a few moments in five figures against the skyline, and then down again, shoes in hand, scattering back into camp. The styluses go zipping about an endless succession of feet, insistent voices proclaim scientific names of foot troubles, felt but undefined by their owners, and at their tables the twenty-one recorders scribble merrily away in the sunshine. And on an average of every minute five soldiers leave their footprints on the sands of time.

To a layman, the records of these inspections are astonishing. For ex-

ample, let us take the specific case of the Sixteenth Pennsylvania Infantry. Out of 1,087 men inspected, only 290 sound feet were found. Four hundred and seventy-six men were wearing shoes from one to two complete sizes too small. The Sixteenth Pennsylvania sported 750 corns, 762 ingrowing nails, 613 bunions, to say nothing of such esoteric maladies as "exostoses," "pronation," and "hallux valgus," of which latter misery there were 590 well developed cases. One wonders how the Sixteenth Pennsylvania got over the ground at all.

By contrast to this painful condition, the Thirty-fourth Regular Infantry seems much more able to dispense with motor truck transportation. Out of 685 men inspected in this regiment there were 546 sound feet, although 329 men were wearing shoes altogether too small for them. The Thirty-fourth was very modest with its bunions, only qualifying 42, with 94 ingrowing nails, and 369 corns.

Merely listening to these figures hurts. It fairly makes us ache to think of the Sixteenth Pennsylvania—and this regiment is only a fair average of those inspected, not an extreme case — it makes us ache to think of those 750 corns, 762 ingrowing nails, 613 bunions, and 590 "hallux valguses," worrying their weary way over the hot alkali sands of Texas, with sixty pounds of dead weight per man to emphasize them. But the feet of the Army are of mild concern, according to Dr. Reno, compared to the unconverted feet of benighted civilians. Out of 2,413 civilian adults whom he examined, 2,017 were wearing shoes that did not fit their feet.

As a result of the army inspection, two things happen immediately. Every man was put in the way of getting that one of the ninety available different sizes of shoes which exactly fitted his own particular feet, not as he would have them appear but as the inspection showed them actually to be. Curiously enough, the great majority of the sizes specified after inspection are 7 or 7½. Most army men, especially those who have been several years in the service, have short, wide, stubby feet. They stand on them. The biggest draft of all, according to the Quartermaster's shoe tariff schedule, is 7E. Out of 10,000 pairs issued, there were 1,695 sevens and 1,503 eights as against only 741 nines. Only 77 men wore No. 11's.

The feet of the fighting men are fast being properly shod. But more than that, every man with imperfect feet is set to work to cure them by regularly established foot exercises. That is the other immediate result of the army foot inspection. The men with bad feet are set aside in separate squads and every day put through a series of prescribed exercises just as the whole command goes through setting-up drill every morning. These additional exercises are, in fact, part of the setting-up manual, and they have proved so helpful in the service that they have already been introduced into Yale and Smith colleges. Indeed, they have proved so beneficial that it may not be amiss to describe some of them for the benefit of suffering men and women who would appreciate sound and supple feet for other purposes than fighting.

Well, then, if you should walk through one of the camps at El Paso, Brownsville, Eagle Pass, or Noagles, you might witness the curious sight of a row of barefoot soldiers standing erect in the early light and, without laughter, all wiggling their toes. Sometimes they stand on planking retrieved from the camp warehouse and destined eventually for shower baths or latrines. At other times they dig a little trench or holes in the ground for the exigencies of Exercises I and II.

In Exercise I every man stands erect, with only his toes projecting beyond the edge of the board or the little depression he has dug in the ground. In this position he repeatedly—thirty times, generally—bends or attempts to bend his toes downward in a gripping movement reminiscent of his prehistoric ancestors. For Exercise II he moves forward a little until half of his foot projects over the edge of plank or depression and goes through the same movement an equal number of times.

When it comes to Exercise III each man moves back until his entire foot rests on a flat surface, when, without raising the body of the foot, the toes are curled back thirty times. In Exercise IV, in this same position, the direction is to separate all the toes thirty times, the way babies do and the way very few of the rest of us can do. In fact, the average facial expression of the enlisted man when Exercise IV is announced says eloquently, "It can't be done." Exercises V and VI are nearly the same. The toes are turned slightly in and the heels out, the weight of the body thrown on the outer edge of the foot, while the toes are bent downward and curled under the foot, or with the weight of the body on the heels the anterior portion of the entire foot is lifted as high as possible from the ground.—World's Work.