

THE INFLUENCE OF THE CONSTANT USE OF
HIGH-HEELED FRENCH SHOES UPON THE
HEALTH AND FORM OF THE FEMALE, AND
UPON THE RELATION OF THE PELVIC OR-
GANS.

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THE foot and its coverings is not a new subject. Far more attention has been given, however, to the style and display of the covering than to the comfort and physical well-being of the foot. The "Athenæum" attributes to Pliny the statement that shoes were invented by Boethum, but intimates that sandals in some form have been in use since the original pair discovered the difference between "the flower-carpeted paradise and the hot sands and sharp stones of that dreary plain." The ancient Egyptians made them of leather, and for the priests of palm leaves and papyrus. The Hebrews made them for soldiers of iron and brass, but for others of linen and wood; and the lovers displayed their gallantry by engraving the likenesses of the adored ones upon the soles of their foot-dress, "so that the pathways of the lovers became the picture-galleries of the loved." The *calcei*, with uppers and soles of leather, were worn by those who walked much. The *soleæ*, which were variously ornamented, were for use in the house. The red or purple shoe was first worn by the kings of Alba, and last by the old Roman dandies. Then followed the sharp-toed shoe and half-boots of old Germans; the high-heeled, long buskins, and the shoe with leather soles of the Roman women, which enabled the wearer to move about at home without any other foot-covering. The old bark shoe was probably the progenitor of the French sabots, which were

in common use and very fashionable throughout Europe during the ninth and tenth centuries. During the reign of William Rufus, a famous beau, surnamed the Horned, introduced the long-pointed toes, twisted like a ram's horn; and during the time of Richard II. the toes were lengthened so as to be fastened to the knees by chains of silver and gold. For three centuries the church and public officers inveighed against this fashion, but not until 1463 was it prohibited by an act of Parliament. Afterwards fashion and taste expressed their extravagance in increasing the width of the toe of the shoe, which Queen Mary was compelled to restrict to six inches; and then followed the elegant buff-colored shoes, with enormous and lavishly embellished tops. The heel at first was a device to make short men look tall, and, like the other parts, has undergone many changes to suit the whims of fashion and taste. The French high heel worn by women is not only very high, but also narrow, and inclines from behind forward, so that its inferior extremity (Onimus), instead of being under the calcanean tuberosity, is directly under the plantar arch; so that increased height, with diminution of the size of the foot, is secured. This style was introduced during the Regency. Under Louis XIV. the heel was high and circular, but not oblique. During the reign of Louis XVI. this objectionable style began to disappear, but has been again revived and is perhaps more general now than at any previous time. During all these periods the feet were the objects of the most conspicuous vanity, fantastic conceit, and costly decoration. At some of the barbaric courts the soles of the shoes worn by men were made of plates of silver or gold, and the brilliant material of those worn by the ladies was half covered with precious stones. Even as late as the time of George III. a young married couple was presented at court wearing shoes with buckles worth two hundred thousand pounds. Popular patterns have, at different times, been designated by the names of prominent persons, or for a special class of the nobility, but only in a single instance known to the writer has a prince or em-

peror derived his name from the style and material of the shoe, and that one the brutal Caligula.¹ In the seventeenth century the patterns were greatly modified, and made more simple and less ostentatious, but with little regard to the physical well-being of the foot. Towards the close of this century Camper published his work on the best form of shoe, in which he discussed the question from the stand-points of anatomical construction, utility, and comfort.

Every intelligent observer must have recognized the potent and pervading influence of prevailing fashions and common customs upon the human mind and body. Few, if any, can alienate themselves from the insidious and ever-changing agencies of association, example, and observation. Habit is not less potential in producing modification of form than in effecting alteration of single parts and disturbance of the functions of special organs. Everywhere, among all civilized nations, in all countries and climates, in every sphere of life and grade of society, in all trades, occupations, and professions, individuality is characterized by diversity of form, inequality of mind, gradations of caste, and variations in temperament, disposition, and constitution. If it were not so, human life would be simply the monotonous change from birth to death.

The causes that have produced these inequalities and dissimilarities in the descendants of a common parentage are as numerous and multiform as the distinctive differences of individuality. Nevertheless, we recognize types that distinguish races, nations, communities, and families. These types refer to modifications of form, and to the mental and personal qualities that characterize peoples, not individuals, and are the results of a complex and constantly changing combination of influences in long-continued, persistent, and habitual operation.

The variations in form of the types of the different races and families are far less marked than their social, mental, and personal qualities. It is not possible, at this time, to

¹ The historic details have been collated and condensed from Camper, Dowie, Onimus, and the *American Cyclopaedia*.

trace the gradual, imperceptible, and progressive evolution of these types of form, or to determine the combination of influences, or even the most constant or potential factor of any group or succession of circumstances, which have established the forms now accepted as the standard of race and family development.

The deviations from these types of species and families that distinguish individuality are even more numerous, diversiform, and variable than the differences of types of form; and their causes are equally diversified and composite, but very frequently can be ascertained with an approach to accuracy.

The evolution of the typical and individual forms of the female sex have, undoubtedly, been influenced, and in a measure determined, by the same general order and succession of events and circumstances of life; but the anatomical differences and peculiar physiological functions have so marked the general contour of form that concealment of sex is almost impossible, however skillful the effort to escape detection. These characteristics are not so apparent during the earlier years of life, and it is not improbable that if the physical, mental, and moral training were alike in both sexes subsequent and mature development would exhibit, in the general outlines of form, fewer and far less obvious dissimilarities.

Age, pregnancy, and maternity are manifest and admitted agencies in the causation of deviations of the female form. Stature and the habits of posture and carriage are perhaps equally potential. The development, tone, and exercise of muscles; sparseness, redundance, and distribution of adipose tissue; laxness or tension of articulations; the mobility of joints, and degree and extent of the normal curves, are also factors, operating either singly or conjointly, sometimes as primary, and at other times as correlative and compensative, agencies. Asymmetry, either connate or acquired, is the most common of physical defects. Lateral asymmetry is the ordinary result of over-use or disuse of corresponding parts. Disproportion between the trunk and lower extremi-

ties is more frequently a natural defect of embryonic and pre-natal development, and is a characteristic of some species and of many families.

From the foregoing considerations it must appear that the study of the natural history of the evolution of the types, variations, and individualities of form would involve an extensive research in ethnology; the determination, grouping, and sequence of causes; and an examination of the mechanism of the human frame and its adaptation to the exigencies, mutations, and successions of life. Into such an inquiry I do not propose to enter.

The study of the influence of a single factor, such as I have indicated, is embarrassed by all the conditions of life to which I have referred. Hence the dogmatic assertion of any general law, applicable alike to the different types and diversities of form, is unattainable. Experimentation is impracticable, except under circumstances that would admit of the comparative management of two identical forms, under like conditions and development, from early life to maturity, and even to advanced life: the one being subjected to the artificial props beneath the plantar surface, and the other left to bear her weight upon the unprotected soles of the feet. Of the first, numerous illustrations in process of continuous development are supplied in every town and village in the country. To secure the latter would prove a difficult task in this esthetic age. I must therefore be content with a cursory and general presentation of the subject, and the conclusions reached through the processes of observation and inductive reasoning.

Paget has supplied the following description of a perfect female foot: "Great breadth and fullness of instep, a well-marked great toe, a long second toe, projecting a little beyond the great toe, and a very small, or in some cases almost suppressed, little toe." The foot is divided into the tarsus, metatarsus, and toes; and the sole is so formed that we rest upon the heel, the articulation of the instep with the toes, and, externally, upon the tuberosity of the fifth metatarsal bone. The bones of the foot form a double

arch, the inner span extending from the heel to the distal end of the first metatarsal bone, and the outer span from the heel to the fifth metatarso-phalangeal articulation. The elongation of this arch is of a twofold character: first, by flattening under the weight of the body, and consequent recession of the toes and heels, and lengthening of the foot forwards and backwards; the second, at the articulations of the instep and toes, when the toes are turned upward, and is due to the hinge-like nature of these joints. When the toes are stationary upon the ground, elevation of the heel will produce elongation backwards. This backward elongation is to a considerable extent compensated by the tension of the muscles of the sole upon the heel bone, and the consequent elevation of the height of the arch. This double-spanned arch also possesses lateral expansion.

The feet and legs constitute a complex arrangement of levers with movable fulcrums, hinge-like and socket joints, surrounded by elastic and elongating structures of very variable strength and tensile mobility, so that every deviation of the base of support is so quickly compensated that equipoise is maintained. In walking, the heel touches the ground first, and supports (Onimus) the whole weight of the body for a moment. A little later the point of the foot touches, and assists in preserving the equilibrium by increasing the base. During the second movement of walking the heel is raised (see Figs. 2 and 3), and the weight of the body is shifted more and more to the centre of the foot and to the toes, the latter spreading and pushing the body forward. This last is the movement which displays to the greatest advantage the suppleness and elasticity of the articulations of the foot, and the adaptation of the arch to receive the weight of the body and to transfer it to its distal pier, while the body is being moved forward by the same act. It is the execution of this movement which gives to the gait of women that elegance and those graceful undulations which are so attractive. Comparative observations show that high and narrow heeled shoes not only displace the supporting base and upper part of the

foot, but so modify the movement that there is no longer succession of contact and pressure. Practically both piers of the double-spanned arch strike at the same time, and from the moment of contact the weight of the body is upon the distal pier (Fig. 3) and toes. Hence, walking, instead of being undulating, is stiff and hobbling, and the body advances by jerks.

Fig. 1.

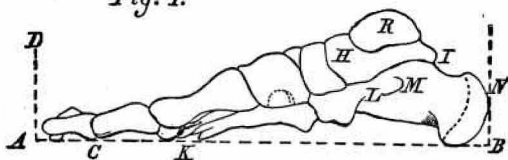


Fig. 2.

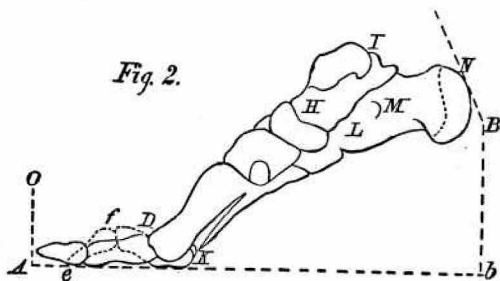
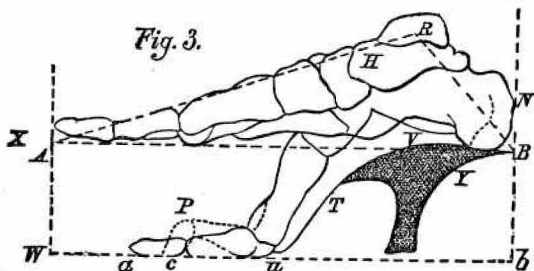


Fig. 3.



(FROM CAMPER.)

The bones of the instep are capable of but very little movement. When standing, the heel bone (*NMI*, Fig. 1), the joint at *K*, and the great toe, *AC*, touch the support upon the line *AB*. When the feet are shod according to the present fashion, the line *AB* is made to assume the concave form shown in Fig. 3 by *BVTu*. The instep

is made more convex and rounded, which is specially esteemed by a certain class as a peculiar beauty, and the foot is actually shortened (see *AB*, Figs. 1 and 2). In those long accustomed to such shoes it is more than probable (Camper) that the heel bone receives the astragalus (*H*, Fig. 1) upon the eminence *ML*, and the astragalus (*H*, Fig. 3) is bent downwards. This is most apt to occur in young persons, while the neck of that bone remains cartilaginous. The constant elevation of the heel places the body of the pedestrian in the same position as when standing upon an inclined plane, which is not only a weak attitude to sustain weight, but very fatiguing to the muscles thus called into action, and compels the lifting of the knee higher. It imposes also a greater expenditure of force, because a new start is made on stilts from a comparative state of rest at every step. Again, the heel is so shaped and located (Dowie) that it forces up the key-stone of the arch, and weakens the whole structure. If the arch needs support the span of the support ought not to be less than that of the arch, yet the mechanical construction of the shoe heel and shank not only ignores this principle, but may injure an arch needing strength. The alteration of the normal line of the sole of the foot, caused by the rigid fixation of the arch in this strained position, produces atrophy of the muscles of the heel, instep, and ankle, because of the comparative disuse; weakens the lateral and longitudinal arches; increases the curve of the sole, giving rise to a rocking motion and jolting gait, retarding progression and consuming muscular force; bends the toes upward, thus injuring the muscles of the sole by too continuous extension, and those above by excessive contraction; injures the fleshy part of the great toe by too great and constant pressure; cramps the toes; diminishes the elasticity of the foot; prevents elongation of the arch, and the ready adaptation of the system of levers to the variations of stature; calls into action strained muscles, and imposes upon them unaccustomed movements; and so disturbs the natural bearings of all the parts as to interfere with the general health.

A comparison of the normal or perfect female foot and the malformed foot represented in Figs. 2 and 3 ought to convince the most enthusiastic devotee of the evil effects of the French high-heeled shoe. A further examination of the diagrams will show that the toes may also be greatly distorted. The continuous pressure upon the joints of the instep and toes and the tension of the muscles and tendons of the sole of the foot produced by the misplaced heel distorts the toes, as shown by the lines Dfe in Fig. 2, and aPc in Fig. 3, so that the tread of the foot, represented in length by the line AB , is shortened by the distance Ae in Fig. 2, and Wc in Fig. 3.

The astragalus receives at R (Fig. 3) the weight of the body, which is transmitted along the lines RB and RA . If the hollow of the foot should be made to touch the ground, the line AB would be lengthened by the distance from A to X . The conditions of superincumbent weight, which would thus flatten the arch and increase the length of the foot, might exaggerate the deformity shown in Fig. 3 in a foot geared in this style of shoe. The diagrams show, furthermore, that the measurements taken in the air, as is usual, of feet thus distorted, are necessarily too short, and the feet will be cruelly pinched in the erect position between the lines NB and AO (Fig. 2) by shoes made by such measures.

The casual observation of awkwardness and unsteadiness of carriage of the wearers of high-heeled shoes, and the occasional occurrence of injuries to the feet and ankles attributed to their use, had long ago impressed me with the belief that the inexorable precept of fashion had lengthened the shoe heel far beyond the conveniences of easy and graceful locomotion, and that results would follow their continued use other, and perhaps graver, than the callosities, bunions, in-growing nails, sprained ankles, and painful calves which so frequently torment the votaries of this reprehensible practice. But not until I had seen, under advantageous circumstances, not long ago, at a fashionable summer resort, the most advanced style of full toilet foot gear,

did I appreciate the probable extent of its influence upon the growing form of the female. It had become the custom for the lads and misses of all ages from five years to early puberty to assemble, during the evenings, in the parlor, and engage in the dance. This company comprised many different sizes and forms, which exhibited the grades and phases of childhood development in great variety. The feet and ankles of the larger number of girls were geared in shoes with heels so high and slender as to fasten them in the position as if always walking down-hill, the toes being pushed more and more forward. The rigid fixation of the feet in this unnatural position diminishes their size, lessens the spring and elongation of the double and elastic arch of the instep, and confines the muscles, tendons, ligaments, and bones in strained relations, impeding, if not arresting, the processes of formation, waste, and repair. It disturbs the articulation of the diversely shaped surfaces of the many small bones comprising the instep, destroys the easy, free, and elastic mobility of the tarsal and metatarsal joints, and transforms the tarsus, metatarsus, and phalanges into a rigid body not unlike a shoemaker's last. The excessive elevation of the heel displaces the centre of gravity, which should coincide with the centre of movement, and transfers the weight of the body, for the most part, from the heel to the metatarso-phalangeal articulations, — joints arranged with shallow sockets to facilitate movement in every direction, and to expedite progressive motion, but not to bear the burden of the body-weight.

The movement, attitude, and poise of those whose feet were thus tackled with fashion's latest and choicest pattern of high-heeled shoes were in marked contrast with those of the less ostentatiously dressed, who retained the free and natural play of their muscles and joints, and the capacity and elasticity of motion and posture which restore the body to its balance from any slip or vacillation without apparent effort. The movements of the former were stilted, uneasy, restrained, and executed with caution, under mental strain and with unnecessary expenditure of force. As I sat, even-

ing after evening, in that gay saloon, a silent and unknown spectator, I could see the gradual effacement of the merry dimples and glow of health from their cheeks, the deepening lines denoting wear of body and tire of nerve, and the pallor of distress creeping over their youthful faces, as they limped or staggered to places of rest.

The physical well-being of the feet is a necessary and important part of the general sanitation of health. Pedestrian exercise is the great promoter and conservator of functional activity and constitutional vigor. To enjoy it, and to realize the benefit to the fullest extent, the feet must be healthy and the foot-tackle free and easy. Sore, contracted, and crippled feet, strained and stiffened joints, altered and displaced articulating surfaces, restrained mobility, and alteration of the line of gravitation (any one or all of which results may find their cause in too early and too constant use of high-heeled shoes) impede and augment the fatigue of locomotion, and make walking exercise painful. *Per contra*, they conduce to the acquirement of ungainly habits of carriage; to disproportion of the component parts of the body; and to a sedentary life, with its manifold disturbances of the animal economy. Yet how many matrons throughout the land will entail upon the mothers of coming generations some one or more of these injuries, with the long train of consequent sufferings, rather than abandon the fashion of a shoe!

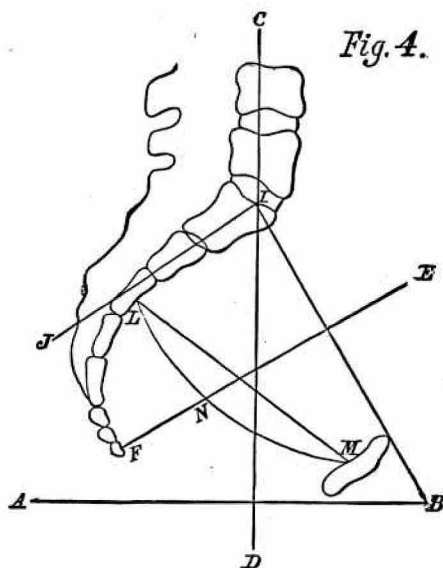
The injuries are not, however, confined to the feet, their joints and component structures. During the same series of observations I had the unusual opportunity of studying the influence of heel-elevation upon the general outlines of the body; for the exuberance of fancy in toilet was not limited to esthetic decorations of the calves and feet, nor were the devotees of extreme styles narrowed to the ages of growing and immature girls. I could outline the comparative increase of the ankle, knee, and ilio-femoral flexures, and the exaggeration of the curves of the spinal column. These alterations of the natural angles and curves give the fore and aft outline of the general contour an in-

and-out or zigzag course. The degree of the angles and radii of the curves vary according to stature, form, and size. The law of adjustment seeks compensation for the primary deflection by exaggeration of the nearest flexure in the opposite direction. The elevation of the heels displaces forward the base of the line of gravitation, and transfers greater weight to the distal extremity of the plantar arch. The equilibrium of the body can only be maintained by increase of the natural bendings and curves along the line of the bony framework. These angles and curves are usually so concealed or obliterated by the necessary coverings and decorations of the figure that the effect upon the attitude and pose of person is not necessarily either displeasing or unattractive. The opportunities for embellishment are rather increased than diminished. Art and nature may become co-laborers in the display of artistic costumes and in the arrangement and deception of adornments, if taste and delicacy are not outraged. The exaggeration of the dorso-lumbar curve¹ gives fullness to the buttocks, rotundity and plumpness to the abdomen, elongates the chest, and increases the prominence of the bosom; to which in some are added, by the compensating change in the position of the head, elevation of the face, and rounding and filling out of the neck and throat, with effacement of the depressions and irregular outlines,—the whole imparting to the general carriage an air of haughtiness and command, which happily is often modified and softened by the innate womanly virtues which find expression in the language of the face and tongue. But I am seeking to present the subject in its physical, and not in its decorative, aspect.

The uterus occupies nearly a central position in the pelvis, is “delicately and unstably poised,” and is supported “on every side by the soft and elastic structures which everywhere surround it as closely as if it were enveloped in a fluid.” Its longitudinal axis is coincident with or parallel

¹ This “peculiar bending of the back in the lumbar region” Onimus calls “*Pensellure*, from its resemblance to the appearance of a horse’s back which has been accustomed to the wearing of a saddle.”

to the axis of the plane of the pelvic brim, forming, with the vagina anteriorly, and upon itself at the junction of its cervix and body, very obtuse angles. So that the line of gravitation, which, because of its position and attachments, is through its longitudinal axis, would, according to natural laws, be vertical through its centre of gravity. Its centre of gravity, being supposed (Duncan) to be the centre of its mass, must be above, and the vertical line of gravity must be anterior to, the cervical attachments. The



PLANES OF THE PELVIS, WITH HORIZON.

- A B* Horizon. *C D* Vertical line.
A B I Angle of inclination of pelvis to horizon, equal to 60° .
B I C Angle of inclination of pelvis to spinal column, equal to 130° .
C I F Angle of inclination of sacrum to spinal column, equal to 130° .
E F Axis of pelvic inlet. *L M* Mid-plane in the middle line.
N Lowest point of mid-plane of ischium. (FROM PLAYFAIR.)

plane of the brim inclines (see diagram No. 4) at an angle of 60° , and the longitudinal axis of the womb, vertical to this plane, inclines at an angle of 30° . This relation, though not mathematically accurate as thus expressed, is the generally accepted rule of normal anatomical relation in the erect position of the body, except so far as it may be dis-

turbed by the exigent oscillations, within a limited arc, of a body so delicately poised amidst contiguous organs subject to such fluctuating conditions as the female pelvic viscera. Then, so long as the coincidence or parallelism of these axes is maintained, so long will the uterus approach the horizontal line, in direct proportion with approximation of the plane of the brim to the vertical line; consequently, as the inclination of the plane of the brim increases or diminishes, so, reversely, will the uterus, through its long axis, approach or recede from the vertical line.

The weight of the trunk is balanced upon the ilio-femoral articulations, and "the centre of gravity of the parts above is (Duncan) nearly vertically over these articulations." The line of gravitation and the axis of the body,¹ though not universally believed to be coincident lines, are, with sufficient accuracy, represented by a vertical line bisecting a horizontal line passing through the centre of the ilio-femoral articulations. The centre of gravity and line of gravitation vary with every backward and forward movement of the trunk upon these joints; and the inclination of the womb follows the variations in the inclination of the pelvis, according to the law as previously stated. In an elastic and flexible body, like the human form, with its numerous deviations from a straight line, nature re-adjusts disturbances of equipoise by compensating alterations of the bendings and flexures.

The question now arises, How are these relations of the natural conformation influenced by the excessive and constant elevation of the heels by the use of high-heeled shoes?

¹ In the diagram of Hodge (*Diseases Peculiar to Women*, pp. 317 and 328), the axis of the body is represented by a line touching the anterior surface of the third lumbar vertebral articulation, and passing through the body of the ossa pubis. In his *System of Obstetrics*, p. 30, Hodge says, "The axis of the body, when in the erect position, may be represented by the line of gravity. This line of gravity, or vertical line extending from the top of the head to the ground, passes through the lumbar vertebræ, the base of the sacrum, and cavity of the pelvis a little anterior to the tubers of the ischia, bisecting a line drawn through one acetabulum to the other."

The primary deflection of the line of gravitation takes place at its base. The ilio-femoral articulations being the pivot upon which the body is balanced, and the fulcrum of its support, and the long arm of the lever being all that part of the stature above these ball-and-socket, and most movable of the limb-joints, readjustment of equipoise is necessarily most easily and quickly restored by increased flexion at the hip, with displacement backwards of the pelvis, which sooner or later will find its compensation in exaggeration of the dorso-lumbar curve. The law of compensation which determines other and permanent alterations of form is well defined, though subject to many variations dependent upon size, height, general conformation, and habit of carriage.

This law may be briefly stated as follows: Every primary curvature is compensated¹ by a second and generally equal curve in the opposite direction, usually occupying the part of the column immediately adjoining the first, and may follow the column in extended sequence of two, three, and even four deviations. The compensation in lordosis is obtained by increased inclination of the pelvis. The ordinary anterior curvature in the loins involves a corresponding displacement of the pelvis backwards, and more especially when the lumbar curve is itself compensatory and consequent upon too great inclination of the pelvis. The latter is most frequently the primary deviation. Pelvic inclination and dorso-lumbar curvature bear a direct and positive relation to each other, the excess in either being compensated by a corresponding excess in the other, so that cause and effect react upon each other, producing increased backward displacement of the pelvis and greater spinal curvature. In curvature of the lumbar region forwards, and "in excessive inclination of the pelvis, with which the lumbar curve coexists and to which it is due," the chest is increased in length; and while the breadth of its lower part is strikingly greater than natural, it is very pointed above, and flattened from before backwards. Of course the ordinary movements of expansion and contraction of

¹ A summary of the conclusions of Rokitsansky.

the chest are disturbed, the diaphragm is depressed, the abdominal organs are displaced downwards, and the vertical pressure of the superincumbent viscera upon the pelvic organs is increased. This pressure does not impinge upon the top of the fundus of the uterus *in situ naturali*, but upon its posterior surface. The tendency, therefore, of (Hodge, Duncan) all pressure from above, the accumulated weight of the organs, aided by the contractions of abdominal muscles, is to press the fundus downward towards the pubis, and to carry the cervix towards the hollow of the sacrum. When the organs are healthy and in a natural position the forward proclivity of the fundus is prevented by the presence of the bladder and small intestines in front, and the ascent of the cervix is resisted by the mass of intestines in Douglas's cul-de-sac. "The bladder (Aveling), when filled, is a heavy organ. In the erect posture, when the pelvis is normally inclined, it rests upon the pubes; but when the pelvis is tilted back, the whole weight of the urine gravitates directly into the pelvic cavity, and presses upon the anterior wall of the vagina. Should this be weakened by disease or child-bearing, it gradually descends and allows the bladder to fall back, describing in its progress an arc of a circle around the pelvic bones, to which it is anteriorly attached." Thus in cases of excessive pelvic inclination the viscus, which is directly instrumental in the redression of the womb and in the preservation of its mobility, becomes a potential factor in establishing a malposition, and complicates the uterine displacement with frequent, difficult, and painful micturition. Cystitis, as the necessary result of incomplete evacuation, may also add its chain of suffering, unsatisfactory cure, and frequent relapses. The rectum is an important organ, and it is not improbable that the disturbance of its postural relation with the sigmoid flexure by excessive inclination of the pelvis may promote the establishment of the habit of constipation, which is so common among females, and so often the cause of no less intractable, but even more painful, affections.

The uterus is so delicately poised *in situ naturali* that

it is probably never at rest during the life-time of a woman. The varying conditions of vesical repletion and collapse, of rectal emptiness and distention, and the movements of respiration keep it constantly moving up and down a plane acutely inclined to the line of gravitation, and to and fro on its transverse axis. This mobility and incessant movement constitute the necessary and most essential method of uterine hygiene. It is this local exercise that promotes healthy circulation, expedites the processes of change and repair, prevents congestion, maintains normal nutrition, and preserves functional activity.

The vascular, postural, and nutritive disturbances growing out of deflections of the skeleton, which I have attempted to show may find their starting point in too great and habitual elevation of the heel, are not necessarily confined to the bladder, uterus, and rectum. All the tissues and organs, the vagina, ovaries, Fallopian tubes, ligaments, and fasciæ, may become involved. Hyperemic conditions, distortions, and displacements, either singly or collectively, may follow in an extended sequence of local and general disorders, but menstrual disturbances and vaginal discharges are probably more common.

To enumerate these affections would extend this paper beyond a reasonable limit. I might show that diminished mobility of the uterus and excessive inclination of the pelvis, with other and consecutive alterations of form, enter also into the causation of posterior deviations and descent. The moment the fundus, in posterior oscillation, passes in the arc of rotation beyond the point of greatest tension of the round ligaments, that moment their action carries the fundus down the arc of rotation towards Douglas's cul-de-sac. This movement would be aided by vesical repletion, deflection of the line of gravitation and of the vertical pressure of the superincumbent viscera, transference of the intestines from the anterior to the posterior surface of the womb, and by relaxation of the abdominal walls.

The equipoise of the body upon the ilio-femoral articulations must be preserved, and Duncan has called attention

to the fact that, while "the small and especially short-bodied women" seek the readjustment of the centre of gravity by moving backwards the head and shoulders, "the tall and long-bodied" seek it by moving forward the supports, which is accomplished "by diminishing the angle which the pelvis forms with the horizon." This change in the pelvis is analogous to that taking place in old age, when the forward stoop is counterbalanced by it. The same distinguished authority points out the fact that when adjustment is effected by backward inclination of the head and shoulders the hips become prominent, indicating "a probable considerable obliquity of the pelvis." In the other class the hips are flattened, indicating lessened obliquity and elevation of the pelvis. These mal-relations of the pelvic and corporal axes are consequent upon pregnancy, and may also follow acquired habits of carriage and posture, such as I have suggested ensue from the constant and habitual elevation of the heel.

I might also trace the obstacles which excessive inclination of the uterus and consequent backward displacement of the os and cervix present to the transmission, tubulation, and lodgment of the sperm cell, impeding the processes of insemination and fecundation, and producing sterility. I need not pause to consider the obstructions to parturition which excessive pelvic inclination may offer, or to trace them back to the gearing of the feet in earlier life. They are sufficiently obvious to every obstetrician.

Onimus says the local and functional troubles are frequently mistaken for strange manifestations of hysteria, varying according to the temperament and predisposition, and very often concealing the true nature and origin of chronic invalidism. In Paris young girls often complain of violent pains in the muscles of the leg, which extend along the external region of the calf to the thigh. A sharp pain from the sole of the foot to the external malleolus is the most frequent initial symptom. The articulations of the knees are many times equally painful, simulating the condition one feels after descending from a high mountain.

which has occupied several hours. But the long peroneal muscle is the one most often affected, because it is most fatigued by the irritation transmitted by its tendon from its insertion at the great toe along the plantar arch. The constant tension of certain muscles to maintain the equilibrium, rendered necessary by the height of the heel, produces painful cramps and a sensation of constriction, even when not walking, and young girls are compelled so seek relief from the lancinating pains by rest in bed. It is easy to comprehend how the general health may be influenced by such functional and local disturbances, and when such conditions exist in women; where the nervous systems are always waiting for an opportunity to become troublesome, we may look for serious pathological consequences.

In the foregoing presentation of the subject I have endeavored to confine the discussion to the physical aspect of the question, and to trace out the relation of cause and effect which may subsist between the prevailing fashions of foot gear and many of the maladies which come under the observation of the gynecologist.

NOTE. — The illustrations exhibiting the alterations in the outlines of stature have been omitted, because the artist neglected to take the photographs of the nude figures, with and without the shoes, in corresponding positions. The differences were sufficiently marked to show the changes in the form of the female, caused by the use of high-heeled shoes. An effort will be made to supply such illustrations at a subsequent meeting.

DISCUSSION.

DR. FORDYCE BARKER, of New York. For several reasons I fear I shall be unable to add anything of scientific value to the paper. All must have been charmed with its literary style and excellence, and in regard to its scientific value it seems to me to be most able. I cannot detect any fallacy in that respect, and must accept every statement and deduction made by the author of the paper. But a great many times in my life I have been forcibly struck by the fact, that, practically, the results are quite different from what science teaches us they should be.

With regard to this very matter, it is now some twelve or fifteen years since what are known as the Louis Quinze high-heeled shoes came into fashion in this country, and having had more or less of the high-heeled *clientèle* I have been watching their effects for some time. We have many American women who go abroad and bring back French fashions and French shoes, and they have been worn amongst us abundantly for at least eight or ten years. But it is a singular fact that the fashion has been slow in getting into England. This depends no doubt upon the shoemakers largely, for this year on my visit abroad I found that in France the high heels are being cut down, while in England and Scotland high heels are worn very much more than any other kind by society women. Now this is all due to the tyranny of the shoemaker. As a rule the feet of English women are not remarkable for their beauty, nor have English women generally a graceful walk, but when the fashion was peculiar to France it was surprising to see those women walking upon the beach at Dieppe, Scoville, and other fashionable watering places, and to notice the gracefulness of their walk, although they had had on these excessively high-heeled shoes. At the same time I must confess that I was not particularly struck with the gracefulness of the walk of the English women with their large-soled and flat-heeled boots. Then again, I have heard a story that a lady who had been wearing these high-heeled shoes went to one of the most celebrated orthopedic surgeons in New York City for some spinal trouble, and when, after examining the case, he found that she was wearing a pair of these fashionable shoes, he immediately seized them and with language more forcible than elegant pulled off the heels and flung them away, following them with a shower of denunciations, and prophesying all sorts of ill results should the abominable fashion be continued. I have heard him speak in the most eloquent terms concerning the evil consequences attendant upon the wearing of high-heeled shoes. Now I think that the most graceful gait and movements which I have ever seen have been in those who have worn high-heeled shoes. I dare say that no one would question the grace and elegance of movement of such actresses as Ada Cavendish, Sarah Bernhardt, and many renowned ballet-dancers and others who have been accustomed to wearing high-heeled shoes. Now this is all wrong, because it is against what science teaches us. For many years I have been accustomed to watch this class of patients to see what symptoms would occur among those who did wear high-heeled

shoes that did not develop in those who did not wear such foot gear. I should like to know whether any one has noticed that the people in that class of society who wear high-heeled shoes have affections of the pelvic organs or other difficulties traceable to this cause, and I hope the question may be answered, as I see there are some here who have had a large experience with surgical conditions outside of those belonging to gynecology. According to science there should have been produced some special ills, and I think Dr. Busey has most ably proved that the elevation of the heels, with the changes which they produce, ought to be followed by all these changes in the angles and curvature of the body which he so logically and clearly describes. In early life, some thirty years ago, I commenced putting down a series of subjects upon which I hoped at some time to write a paper, but which I have never done. Among the subjects which I there noted down was that of "the influence upon the health of women produced by the caprices of fashion." It is needless for me to say that I have not yet completed my paper upon that subject, but the point that struck me with reference to a great many of these fashions was, that although we may preach concerning them, we cannot control them; women have a sharp instinct, and will so array themselves as to make themselves attractive for the other sex. Whatever may be the fashion that is introduced, if it will not accomplish this they give it up at once; but whatever fashion does bring about this result it would be useless for science to attempt to combat. I am glad, however, that this paper has come up, for I hear remarks constantly made of the evil which certain fashions of this kind produce not only in this country but in France, and I hope that the paper will be thoroughly discussed.

DR. T. G. THOMAS, of New York. I shall have but little to say upon this subject, for I feel very much with reference to it as one of the Senators did in the time of Mr. Webster, who said that he had intended to reply to Mr. Hayne, but that Mr. Webster had embodied all that he had to say, and had said it in just the way he intended to say it. I may say the same with reference to the remarks which Dr. Barker has made, that he has expressed my ideas exactly, and I shall therefore have but little more to say. I feel that the paper read by Dr. Busey should be published in non-medical journals as well as in medical ones. It should be published in journals which will reach the masses

the evils attending upon the fashion mentioned. But I think that the paper is weak in some few points which I shall now proceed to mention.

I think that the health of our women depends very greatly upon the development which they receive in youth, and I believe that such games as croquet and lawn tennis have done more for the health of American women than many volumes could have done upon this subject, even when indorsed by the statements of physicians. What will contribute most to the health of our women will be to make popular such exercises as will render it impossible for our girls to wear tight clothing or similar injurious styles of dress. Such a paper should set us to thinking. It is one which will do much good, and it should be thoroughly and fully considered. But there is this to be remarked, that a woman who has tender and badly shaped feet, whose spine is not perfectly straight, is the woman who of all others we may expect to have uterine disease, for the reason that she will develop badly, and the pelvic organs among others will suffer to a greater or less degree. I admit all this, upon which the value of the paper depends, but I am afraid there is an inherent weakness in the subject. I have watched patients who used high heels, and have watched them with special reference to the influence which this particular fashion might have upon the pelvic organs. I have felt that it should be bad, and that women who wear high-heeled shoes should surely have uterine displacement, but I have been surprised to find that those women do not have such displacements. I have been fully prepared to believe in the direct influence of high-heeled shoes upon the pelvic organs, but I have been disappointed with regard to it, although I have had under observation women who have indulged in this pernicious habit for years. I believe the reason is, that these women did not begin to wear such shoes in early childhood. I should say that the general influence certainly is very deleterious indeed, but that the direct influence, that is, that the spine is affected, or that the pelvic organs are affected, and that the disorder can be distinctly traceable to this habit, I have not been able to determine. I do not wish in any way to weaken Dr. Busey's paper, but I simply wish to state the facts as I have observed them. I certainly think that the habit is a most injurious one, and that in an indirect way it is one of the methods by which the system becomes depreciated, and renders women the prey of pelvic diseases.

DR. MUNDE, of New York. I would like to challenge one statement made by Dr. Busey, and that is with reference to a mass of small intestines being in the cul-de-sac. As a fact there are no small intestines in the cul-de-sac, as has been satisfactorily shown by Dr. Noeggerath and others. I think it is a wrong impression that the cul-de-sac always contains loops of intestines, for I have distinctly felt them but twice in the examination of over 5,000 women, most of whom were examined many times.

DR. VAN DE WARKER, of Syracuse. I would remark that some very eminent authorities figure loops of intestine in the cul-de-sac. It is certain that there is a great deal of dissenting opinion upon that point, although I think the majority express it as Dr. Mundé does, that as a rule the cul-de-sac is empty.

DR. BUSEY. Perhaps I laid too much stress upon the point which Dr. Mundé raised. Nevertheless, it is not the universal opinion that no intestines are found in Douglas's pouch. It may be his observations have been in one direction, and those of others have been different. It is not in this connection a material point whether small or large intestines are there; there is something there which is constantly subjected to changes in position. In reply to Dr. Thomas I will add that it is impossible to say definitely what the precise effect would be because of the diversities of form; a certain figure might be injured by the constant elevation of the heel, while another form or figure, differing in size and stature, would be affected differently, or might not be affected at all. There is no doubt in regard to the influence of changing the line of gravity and transferring the basis of support forward. No one doubts the injury of such a change upon the feet and effect upon the normal curves of the spine. The other inferences which I have made are simply deductions, not positive conclusions. The probabilities are, that if medical men will bear them in mind they may in future find a more constant relation between cause and effect than is now recognized.

I think if Dr. Thomas would take the profile figure of a female who has been wearing high-heeled shoes for a long time and then remove the shoes and take another profile view he would find an important change in the normal contour. [Dr. Busey then exhibited photographs of a girl who had been wearing high-heeled shoes for a long time.] Dr. Thomas believes that the introduction of games and other athletic exercises are best directed to

sustaining the health of our women. I agree with him in that respect, and not only because of the exercise, but it necessarily dispenses with the use of uncomfortable shoes. Such games prohibit the use of this injurious foot-gear as well as other injurious habits of carriage.

DR. THOMAS. I admitted all these things and accepted what Dr. Busey states with regard to the effect of wearing high-heeled shoes, but I simply made the statement that I did not find the results which he had expected would be found as directly traceable to it.

DR. BUSEY. I think if it could be possible for Dr. Thomas to have two similar female figures photographed at different periods from the age of five up to the age of sixteen years, one having worn high-heeled shoes, so that he could be able to compare them, that he would find a marked difference in their contour. Certainly there would be a change in the inclination of the pelvis, and my inference was that there would be a corresponding change in the position of the pelvic organs.