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The American Journal of Orthopedic Surgery

I.

CONCLUSIONS DRAWN FROM A COMPARATIVE STUDY OF THE FEET OF BAREFOOTED AND SHOE-WEAR- ING PEOPLES.

PHIL. HOFFMANN, M.D., ST. LOUIS.

Ample opportunity for the study of feet of individuals that had never worn footwear was furnished by the Philippine exhibit and by the Central African or Pigmy group at the Louisiana Purchase Exposition. Such studies were made on one hundred eighty six pairs of feet.

Objects of the work:

1. General observations on the foot in barefooted races compared with the same in shoe-wearers, including its shape, functions, range of voluntary and passive motion, and relative length as a whole and of its component parts.
 2. Height and shape of the longitudinal arch and its bearing on the usefulness of the foot.
 3. Relationship or coincidence, if any, between the height of the arch and the gait.
 4. Collection of specimens.
- Measurements were made of the body-height and of the length of the foot and its component parts; record was made of the gait whether straight or everted and the degree of eversion; footprints on smoked paper were taken to record the weight-bearing area of the foot and, in many instances to show the extent of foot expansion and arch depression under pressure,

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two plaster of Paris casts of the same foot were made, one in repose and the other bearing the body-weight. The camera also was used to record toe action in climbing and grasping and habitual foot posture in standing and walking.

From observations on the field and subsequent study of the material gathered there, I feel justified in reporting the following conclusions:—

The relative length of the foot to body-height and of the phalanges to foot length are practically the same in barefooted as in shoe-wearing races. *This is true of both the infant and adult.*

The shape of the foot and its range of voluntary and passive motion are practically the same in barefooted and shoe-wearing races *up to the time* of the use of footwear that compresses and splints the foot, usually about the end of the first year, after which, in shoe-wearers, there is progressive narrowing of the anterior portion of the foot and diminution in the range of motion of its phalangeal, tarsal and ankle joints.

The lasts over which the footwear of civilization is shaped are rarely modeled in the spirit of truth that would make them conform to the contour of a normal foot. The whim of society and the manufacturers' enterprise alone regulate their shape. Society, apparently, agrees that the human foot as formed by nature is coarse, vulgar and unsightly, and that its width, especially at the toes, is entirely too great. It regards the small, especially the narrow foot, as the beautiful one. The dictum of fashion has greater influence than reason. Perhaps the statement that society admires the small foot is not exactly true, for society, as such, never sees the naked foot; but what it so commonly does admire is the dainty little shoe that hides its own handiwork—the distorted, cramped, calloused and repulsive foot. Here beauty is less than skin deep, or at most lies no deeper than the calfskin product of the cobbler's art. The manufacturer through ignorance and self interest fits the desires of his patrons rather than their feet, and places upon the market footwear that more or less crowds the front of the foot.

The widest part of an undistorted foot corresponds to a line drawn from the end of the little toe to the base of the great one. (Fig. 1 and Fig. 11 B.) It is just at this point that the conventional shoe is made narrowest. In the normal foot the phalanges are in line with their metatarsals, and when bearing the body-weight the toes separate and widen the base of support.

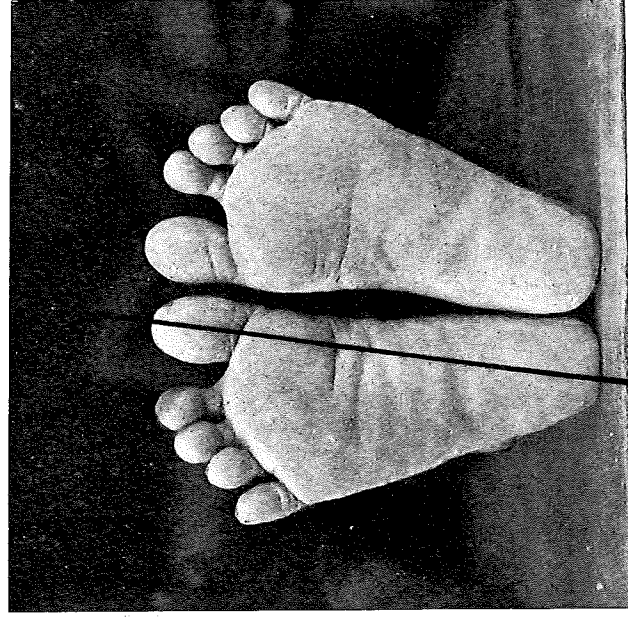


FIG. 1.—PLANTAR VIEW OF FEET OF NEGRO, SHOWING STRAIGHTNESS AND SEPARATENESS OF TOES; TRANSVERSE FOLDS IN SKIN OF SOLE; WIDEST PART OF FOOT AT TOES; LONG AXIS OF GREAT TOE PROLONGED BACKWARD STRIKES CENTER OF HEEL.

Especially is this true of the great toe, which is separated from its neighbor by a considerable interval, and in this position assists in keeping the foot adducted and is a considerable factor in the work of leverage. This is universal among barefooted races. (Figs. 2, 21, 22, 23, 24 and 25.) As evidenced by classic sculpture, this toe separation was the rule also in ancient sandal-wearers, whose footwear did not compress the feet.

