Children's Footwear: Launching Site for Adult Foot Ills

It's time to advocate shoelessness for kids.

By William A. Rossi, DPM

A maze of mythologies has surrounded the foot and footwear of infants and children for generations. Medical practitioners, especially podiatrists, orthopedists and pediatricians, have been in the front lines of shaman-like attitudes and therapies concerning the foot-shoe relationship of juveniles and the hazards of the growing foot.

As a result, by the time the average shoe-wearing child has reached the tender age of seven or eight, his or her feet clearly reveal a visible loss of anatomical and functional normality. The medical practitioners are quick to attribute this to the wearing of "improper" or "ill-fitting" or out-grown shoes—not realizing that there is no other kind because all (99 percent) of juvenile footwear, regardless of price or brand, is "improper" and "ill-fitting".

Back in the 1960's and in the many prior decades, there were dozens of manufacturers of juvenile footwear with prestigious brand names, and all claiming dedication to "healthy child foot development." To name a few: Stride Rite, Buster Brown, American Juniors, Step Master, Buntees, Mrs. Day's Ideal Baby Shoes, Dr. Posner, Markell, Educator, Stepmaster, Junior Arch Preservers, Child Life, Clark's of England, Jumping Jacks, Little Yankees, Edwards, Proper-Bilt, Trimfoot, Pro-Tek-Tiv. Europe boasted similar leading brands devoted to "healthy child foot development."

> ***Prior to 1970 from September to mid-June, all children wore sturdy leather "school shoes."***

Almost all of those once-prominent brands are deceased today, the victim of low-cost imported shoes (now comprising 94 percent of all U.S. footwear consumption), plus the invasion of the sneaker boom, which began in the early 1970s and today dominates the juvenile footwear market.

For decades prior to 1970 it was established custom that for about nine months of the school year,

Continued on page 84

Children's Footwear...

September to mid-June, all children wore sturdy leather "school shoes" and for summer switched to sneakers.

Year round, an important part of the marketing program of the juvenile shoe producers was not only national advertising but also a steady stream of "educational literature" in the form of pamphlets and booklets distributed to stores and parents. These materials described and illustrated child foot anatomy, the foot-growing process, the importance of proper shoes and proper fit, cautioning about outgrown shoes, etc. And of course, concluding with the merits of the sponsor's shoes "dedicated to healthy child foot development." Significantly, the manufacturers spent not a penny for foot or shoe research.

Influential magazines like Parents and My Baby became channels for "public education" on child foot care and children's shoes—though never a critical word about the footwear itself, which could jeopardize advertising income from the manufacturers. It was a simple quid pro quo arrangement.

It was generally accepted by parents and medical practitioners alike that "proper footwear" was widely available for children, and if shoe-related foot disorders developed it was due to "ill-fitted" or "outgrown" shoes. There was little or no questioning the inherent design and construction faults of the shoes themselves by medical practitioners or others. Children's footwear was clothed in a holy shroud. Nobody saw the devils lurking inside.

Nothing Has Changed

Children's footwear today is made, fitted and sold by the same naïve rules as a half-century and more ago. The dinosaur hasn't moved an inch. And the medical practitioners, usually the tail on the dinosaur, continue to prescribe or recommend children's footwear by the same seriously flawed rules of the past.

The consequences? No shoe-wearing American or European adult owns a normal or unspoiled foot anatomically or functionally. By "normal" or "natural" is meant in comparison to the pristine feet among the estimated one billion people of the world that go through life unshod.

Almost all (95 percent or more) of these physically deprived feet of adult Americans and Europeans begin in childhood with the wearing of faultily designed and constructed footwear, starting in infancy.

And all of this has occurred under the presumed "health guardianship" of the foot-related medical specialists: the podiatrists, orthopedists and pediatricians.

Myths About the Growing Foot

Today we continue to use the same "rules" for child foot care and footwear as we did half a century and more ago. Shoe people and medical practitioners alike contin-

Continued on page 86

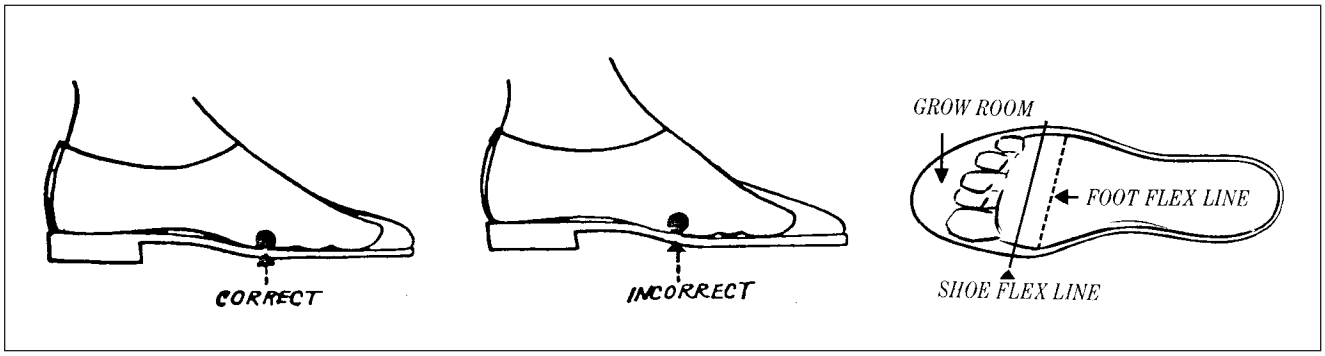

Figure 1: Left, correct fit with hallux joint matching ball joint of shoe; center, with grow-room allowance hallux-joint moves back, no longer mating with the shoe's ball pocket. Right, grow-room allowance creates a mismatch of ball flex line of foot and shoe.

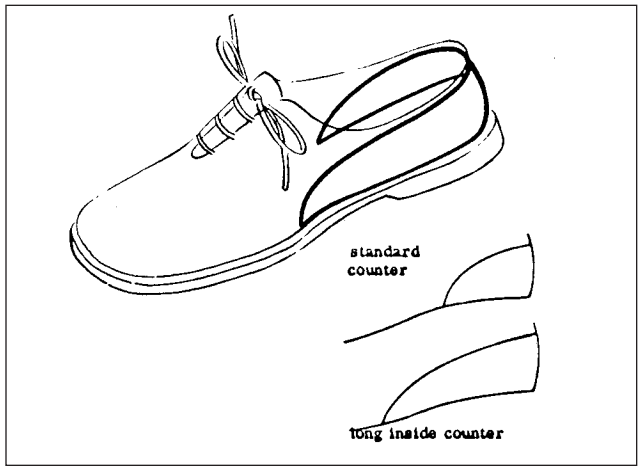

Figure 2: Long or extended medial border shoe counter supposedly for supplementary arch support.

ue to cling to these rules as though they are holy writ. Some examples:

The Myth of "Grow Room".

The shoe should be fitted to the child's foot with a half-inch or more of "grow room" at the toe. Others use the rule of thumb—a thumb's width (nearly an inch) grow-room allowance. But a shoe so fitted is anatomically a misfit (or overfit) because the foot's hallux joint no longer matches the hallux joint pocket in the shoe. (Fig. 1) Further, the heel-to-ball and heel fit are misaligned with the corresponding parts of the shoe. Neither the manufacturers and retailers nor the shoe-prescribing doctors have given any serious consideration to this dilemma. Thus the first rule of "proper fit" is automatically disqualified. One additional point: the half-inch or more of grow room with the new shoes automatically moves the foot's ball flex line a half inch or more behind the shoe's flex line. (Fig.1) This creates a conflict between the two flex lines.

The Myth of Support

The growing foot needs "support." This popular myth not only persists, but also has led to an array of abuses by the doctors and shoe people alike. First, a question: Precisely where, how and why does a growing foot need support or reinforcement? One long-common answer is that in shoe-wearing societies we walk on non-resilient floors and pavements, hence the growing foot needs to be protected by a buffer zone device such as a built-in arch support in the shoe or a steel shank or separate orthotic (Fig. 3) This has no validity whatsoever. From infancy on, most of the hundreds of millions of shoeless people of the world habitually stand and walk not on soft, yielding turf (a persistent myth among medical practitioners) but mostly on unyielding ground surfaces. Most shoeless children are raised in such environments in cities like Bombay, Manila, Mexico City, Calcutta, Jakarta, Bogotá, etc. where the streets are either cobble-stoned or paved or with hard-packed turf. Those uncovered, "unsupported" feet grow with strong, normal arches. (Fig. 4)

Figure 4: Perfect feet of shoeless young boys. Note straight toes and spaces between.

A century ago, the rickshaw, which originated in Japan, was the common means of transportation in many Asian cities. In 1910, some 18,000 rickshaws and 27,000 rickshaw men were registered in Shanghai alone. The rickshaw men, most of whom began their occupations in their late teens, averaged 20-25 miles daily, trotting barefoot, mostly on cobbled or paved streets and roads. Many stayed at this occupation for 40 or 50 years. The feet and arches of almost all were healthy and exceptionally strong.

In the same context are the tens of thousands of workers who daily load and unload ships while working barefoot on the docks of such coastal cities as Singapore, Jakarta, Bombay, etc. They carry back loads as heavy as 50 and 60 pounds on their shoulders, walking barefoot on the thick planks. And rarely a foot or arch complaint.

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But the foot support idea goes beyond the arch. Doctors and shoe people alike continue to espouse the invalid contention that the foot's instep and waist also need support—which is why oxford and laced shoe styles with their firm gripping are virtually standard for prescribed footwear. But instep and waist support, like the 19th century corset, is constrictive, and prevents the foot

Continued on page 88

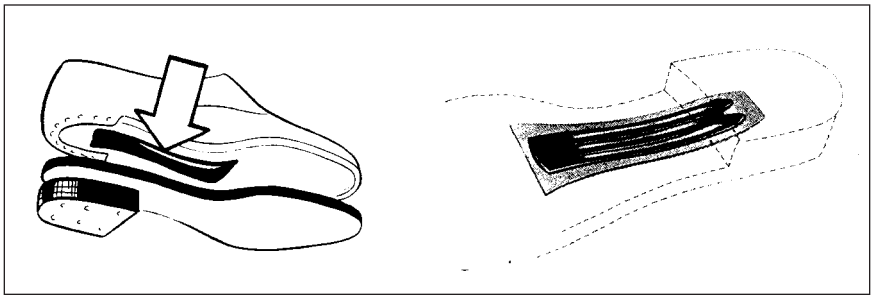

Figure 3: Steel shank in child's shoe for "arch support".

from expressing its normal stretch and contraction action on weight bearing.

Further, laced-type footwear, the most common worn by juveniles, is constrictive. Most kids tight-lace their shoes. This imposes pressure on the dorsalis pedis artery, restricting normal blood flow through the foot 16 hours a day.(Fig 6)

The Myth of The "Snug-Fit" Rule

Shoe people, along with many or most medical practitioners, advocate "snug fit" at the ball—again for "support". The snug-fit rule is seriously negative because it restricts one of the growing foot's most important needs: the elastic movement of the metatarsals and their surrounding tissues with each step.

The chance of proper fit with sneakers is much lower than with conventional shoes.

The Myth of Ankle Support

One long-held reason for booties in preference to low-cuts for infants is the persistent belief that the ankle needs "support". But to the contrary, the ankle needs exercise for development. Ankle support is the equivalent of a restrictive corset. (Fig 5)

The Myth of Heel Support

"Heel support" via heel-gripping back part fit and firm counters is another myth in the child foot development rulebook. Except in the very small percentage with excessive pronation, the heel should be allowed full freedom of movement for normal exercising of the Achilles tendon and ankle structure.

There are pronounced differences in the strength and power-lift capacities of the heel tendon between shoeless and shoe-wearing people, again emerging from the childhood years of foot development. This has an enormous influence on postural balance and gait stamina. A dramatic example of this is seen among the marathon runners from African nations such as Kenya where barefootedness is the common custom with the majority of the population. Over the past decade their runners have won over half of the first ten places in most of the major marathon events in America and Europe. Much of this can be attributed to not only the unimpeded development of their feet throughout the juvenile years, but to the full-power strength of the heel tendon so vital to the stride stamina required in marathons.

The Myth of Pronation

"Pronation" has become one of the holy words in podiatric scripture. But as with most nebulous terms it defies tangible form. While we commonly speak of "excessive" pronation, there is still no established or measurable standard for normal versus abnormal pronation. Pronation therapy thus becomes largely opinion or judgment therapy.

This spills over into juvenile footwear and built-in pronation "controls" via extended shoe counters, tilted heel seats, reinforcement straps, heel cups, etc. But contrary to pronation controls, the rearfoot begs for freedom of movement within reasonable bounds. Over-medicated shoes impose unreasonable limits on those boundaries.

Figure 5: Metal stays formerly used in corrective shoes for "ankle support".

Sneakers: Not The Solution

Shortly after the jogging-physical fitness boom began in the early 1970s, sneakers, which have become status-lifted and known as athletic, sport or athleisure footwear, showed spectacular growth in consumption by adults and juveniles alike. Whereas in early years the sneaker had been a summer-wear shoe, now suddenly, heavily ornamented and medicated, it was worn year-round. Today, it has largely replaced conventional leather shoes for children.

Up to some 35 years ago most medical practitioners advised parents against habitual or frequent wearing of sneakers by children primarily because sneakers lacked sup-

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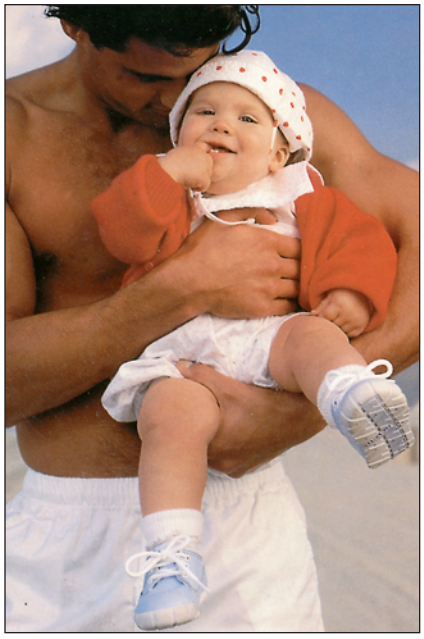

Figure 6: Pre-walker sneakers with thick traction soles and double-knotted lacing

Figure 7: Child's sneaker with traction sole and "toe spring" at tip.

port and also were unhygienic. But sneakers gradually evolved in to "athletic" and "sports" footwear and won medical approval—now cited as being more healthful because they are lighter weight, more flexible, have more breathable uppers, provide better support and are easier fitting—none of which is true. Today's sneakers are as foot-negative as the conventional leather shoes for children. Here are some of the specifics why:

1) Most children's leather shoes come in half sizes. Many juvenile sneakers are available only in full sizes. Conventional children's shoes use the more precise width system of A-B-C-D-etc., where the measurements are largely standardized. Almost all sneakers use the looser N (narrow) M (medium) and W (wide) designation where the measurements are not standardized. That means an M width can actually be an N or W or vice versa. Further, the measurements vary brand-to-brand, style-to-style. Conclusion: the chance of proper fit with sneakers is much lower than with conventional shoes.

2) All sneakers have high traction plastic or rubber-type outsoles. These cause the foot to suddenly "brake" with each step (an average of 20,000 steps a day for an active child). This results in a forward sliding of the foot inside the shoe and a jamming of the toes against the tip of the shoe. This repeated toe trauma is the equivalent of wearing outgrown shoes (Fig. 7)

Significantly, throughout this medical uprising the official voice of the APMA remained silent.

3) Sneakers create an unventilated hothouse for a child's foot. First, the snugly laced shoe creates a closed rim at the top and prevents entry of air and ventilation. Second, the repeated traction action resulting from the high-traction soles increases inside-shoe friction and consequent heat and perspiration buildup—a highly unhygienic environment.

4) Contrary to both popular and professional opinion, sneakers are not more flexible than conventional shoes. The deceptively easy bend of the sole is behind the metatarsal flex line across the foot and therefore in conflict with the foot's normal flex line angle. The easy flexion of the sneaker sole is both an illusion and a delusion.

5) Sneakers have much greater "toe spring" than conventional shoes. Toe spring is the upslant of the shoe's toe tip, creating a space between toe tip and ground. This can be readily seen by placing a

Continued on page 90

Figure 8: Left, child's shoe with one-inch heel. Center and right, classic Mary Jane style for girls, with heels.

Children's Footwear...

sneaker on a table and looking at it in profile. This is contrary to the natural ground-touching position of the toe tips for ground-grasping action.

Exaggerated toe spring alters the level plane of the toes and nullifies their normal function. Why the extreme toe spring in sneakers? Because the thick and inflexible sole prevents normal foot flexion in step push-off, the outsole is given a rocker design to allow a forward rolling motion as a substitute for the normal foot-flexing, toe-grasping step. This same exaggerated toe spring is found in all adult sneakers as well.

6) The sneaker's thick traction sole for juveniles is unnecessarily long wearing. This commonly results in outgrown footwear because parents assume that there's still "good wear" left in the shoes. This, of course, leads to squeezed and misshapen toes and misaligned metatarsals.

7) It is commonly assumed that sneakers are lighter weight than conventional shoes. It isn't true. Modern sneakers no longer have lightweight canvas uppers, but uppers of rugged leather. When these are combined with the heavy soles, the average sneaker usually weighs more than the average leather shoe. Additional shoe weight increases footlift load, which over the course of a day of 20,000 footlifts can make a different of several tons, imposing unnecessary energy drain on foot and leg.

A study conducted by SATRA, the prestigious British shoe research organization, has found out that the repetitive traction/friction action of the sneaker sole generates 50 percent more foot perspiration than smooth surface soles under the same wear conditions.

Tests conducted by the U.S. Army Research Laboratory in Natick, Massachusetts, shows that in desert heat foot temperature rises to 100-103 degrees F in regular army boots, but as high as 120 degrees in sneakers. However, a survey by Lynn Staheli, M.D., published in Pediatrics in 1980, found that 65 percent of podiatrists and 77 percent of pediatricians considered sneakers either suitable or preferable for the infant foot.

Summed up, despite the numerous faults of conventional shoes for children, sneakers have even more. Sneakers, therefore, are not the solution.

Figure 9: Center and bottom, boys' shoes with one-inch heel; top, with 1-1/2-inch heel.

Heels and Toes

For centuries, right to the present day, one of the most foot-negative features on juvenile shoes has been the use of raised heels. For infants and tots the shoe heel height begins at about 5/8ths of an inch. By age five or six the heel height is 3/4ths of an inch, and by age eight a full inch—the same height as on a man's shoe. Heel heights are the same on sneakers as on conventional shoes.

Relative to body height, a one-inch heel worn by a child of seven is the equivalent of a two-inch heel worn by an adult. So almost all children above age seven are wearing "high" heels the equivalent of two inches in height—and neither the shoe industry nor the doctors has any idea of this absurdity occurring before their eyes. (Fig. 8, 9)

A raised heel of any height under the foot of a growing child automatically destabilizes the foot and the whole postural column. Such a foot is thus predestined to grow with anatomical and functional faults—much the same as a young tree planted with its trunk on a slant.

The heels usually start with "first walker" shoes (10th to 12th month) and some have a 3/8th-inch lift called a "spring heel" which is supposed to add forward "spring" to the step and aid in the walking.

Continued on page 92

But the spring heel actually unbalances the body column and disrupts the natural balance and forward movement of the infant.

An elevated heel of any height on a child's shoe shortens the growing Achilles tendon—the beginning of a permanent tendon shortening that begins in infancy and continues through a lifetime for all shoe-wearing people. Further, the elevated heel shortens the plantar fascia by contracting the foot and shortening the distance between heel and ball.

Lastly, by raising the foot's heel, the lateral border of the foot is denied its normal weightbearing function. The normal step sequence—heel to lateral border to ball—is replaced by heel to ball in a kind of slap motion, bypassing the lateral plantar border which is no longer a player for support or step sequence functions.

An elevated heel on the footwear of small, growing children is both absurd and cruel. Among young children there is no demand or clamor for heeled shoes. The heels are imposed on the children by the shoe manufacturers, taken for granted by the parents, and accepted without question by doctors.

No footwear for children under age eight—and preferably up to the age of puberty—should be made with an elevated heel. Exceptions might be made for girls' shoes beginning about age ten if desired for peer fashion reasons. This allowance would be made on the grounds of right of choice—though not on the rightness of choice.

In any shoe-wearing society, by age eight or nine, the toes of most children have lost up to 50 percent of their natural prehensile and functional capacity. They are no longer strong, finger-like, ground-grasping organs but weak appendi-tures at the end of the foot. And by early adulthood the toes will reveal visible symptoms such as incipient hallux valgus, crooked or hammer toes, cramped toes, nail disorders, etc.

Around the age of nine or ten, pre-pubescent girls nearing the threshold of "womanhood" and exposed to the influences of "fashion", begin to demand grown-up styles. An example of this occurred in the early 1960s when "needle-toe" shoes became popular with women. The juvenile shoemakers hopped aboard the bandwagon and offered the sharp-toed shoes for little girls. The latter eagerly responded.

For once—perhaps for the first time—the doctors expressed open rebellion. The American Orthopedic Association issued a public condemnation of such footwear. This was followed by sharp criticism of the shoes from the Parent-Teacher associations. Both influential voices were heard in the national press. The shoe producers quickly retreated, withdrawing their needle-toe shoes from the market.

Significantly, the voice of the APMA remained silent.

Footprints of newborn infants. Full spread of toes, ready for natural grasping action.

Figure 10

Anti-Foot Lasts

Almost all lasts for children's footwear, including sneakers, are "crooked" in contrast to the straight-axis alignment of the foot, heel-to-toes. This has long been one of the chief causes of anatomical and functional foot deformity that

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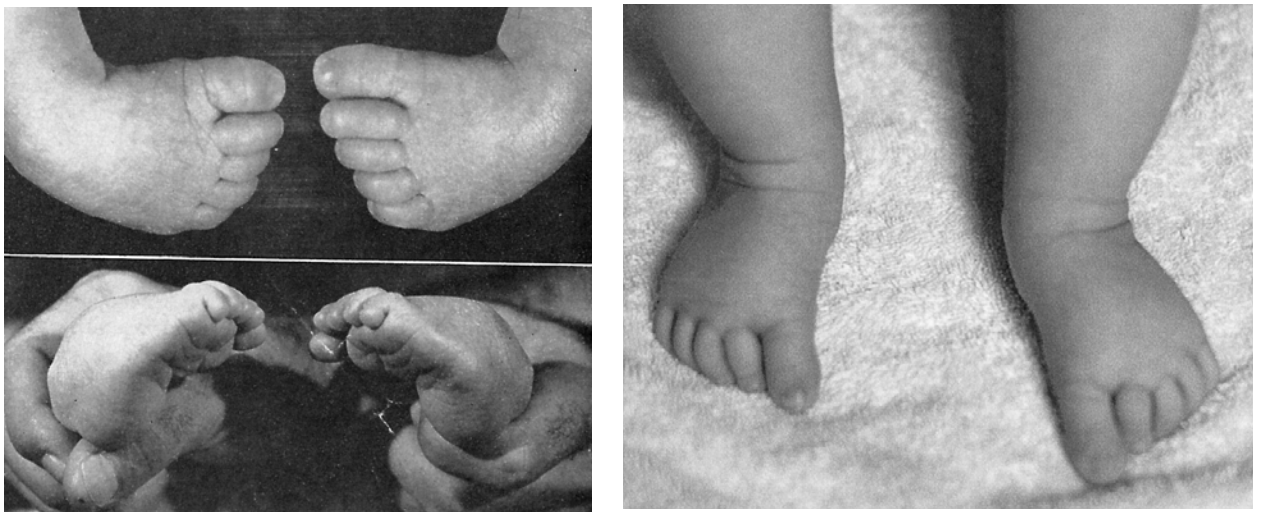

Figure 11: Natural prehensile and malleable quality of infant foot expressing full freedom

Children's Footwear...

begins in childhood and continues throughout all the adult years.

Why this obstinate continuation of crooked-last shoes that are so obviously anti-foot health? Tradition again. Shoes have been made on crooked lasts for centuries, so the manufacturers, along with the shoe retailers, continue to remain blissfully ignorant of this visible conflict between foot and shoe and hence resist or refuse change.

A similar example occurred in the early 19th century when lefts and rights were introduced in shoes. Throughout many centuries prior, most shoes were made on what were known as "straight" lasts, meaning no lefts and rights and either shoe could be worn on either foot. When the first new lefts and rights appeared in store windows, customers chuckled and refused to buy or wear them because they looked "funny"—despite the obvious left and right shape of their own feet.

But why were those made on "straight' lasts instead of the clearly obvious left/right shape of the feet? Tradition again. In the 7th century, the fast-expanding Christian church imposed rigid rules and censorships regarding body exposure. It was decreed that clothing worn by the clergy—priests, monks and nuns—was to be loose fitting to conceal the "carnal temptations" of the body form. From this emerged the loose-fitting robes and the flowing, ankle-length somber "habits" of nuns. Even the sandals were made without lefts and rights so as to conceal the natural shape of the foot. The "tradition" continues to this day, and only very recently were nuns permitted to shift to contemporary modest styling in apparel. So tradition has staying power—which helps to explain the tenacity of our crooked-last shoes of today despite the obvious and contrary straight-axis shape of the human

Figure 12: Sole mates, expressing high ankle mobility

Continued on page 94

foot. Hence an obvious wrong became accepted as an obvious right.

Infants' Shoes

In all shoe-wearing societies (about 80 percent of the world's 6.5 billion people) the anatomical deformity and functional delinquency of the foot begins at about the sixth or seventh month when the infant, still in its crib, is fitted to pre-walker shoes, a laced bootie. Despite the fast-growing foot, the crib shoes are worn until about the 11th or 12th month when the infant begins to walk and is fitted to its first shoes—again a laced bootie, but a firmer sole. (Figs. 10, 11, 12)

It's as though the parents, shoe people and doctors can't wait to begin the primitive process of foot-wrapping, little different than the old Chinese footbinding customs that began when the girl was about age six.

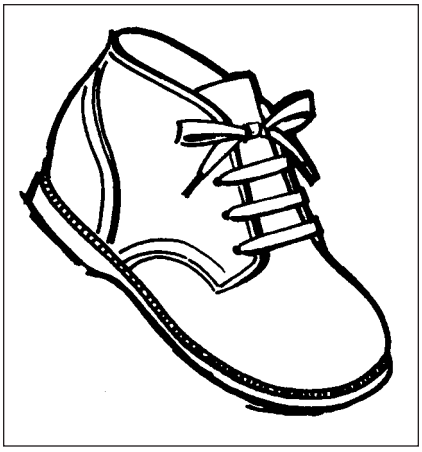

Figure 13: Typical infant bootie with spring heel

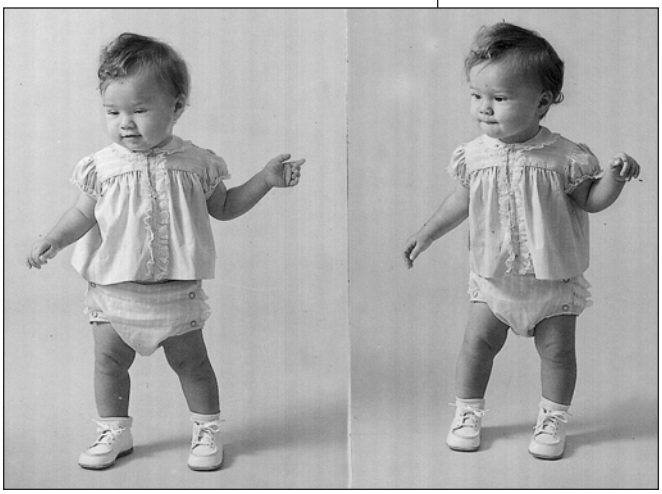

Figure 14: First-stepper infant struggles for balance in new booties

The infant, displaying more common sense than the parents, shoe people or doctors, struggles to pull off the alien wrappings on its feet. But the parent, with equal determination, ties and double knots the shoes tighter to prevent the shoes from being pulled off the feet. The infant's protesting wailing is attributed to "cranky moods". (Fig 12)

In 1980 a group of Thomas Jefferson University pediatricians, led by Jeffrey Weiss, M.D. conducted a survey and study among scores of parents, medical practitioners (pediatricians, orthopedists and podiatrists) and shoe store managers. The published report, appearing in the May 1981 issue of Pediatrics, revealed some significant findings. Among them:

- 73 percent of the involved infants wore shoes before they walked.
- 91 percent of both the pre-walker and first-stepper shoes were laced hightops; 51 percent had some kind of arch lift or "support" and 74 percent had hard soles.
- Most shoe retailers and manufacturers tell parents that shoes will "help the child to walk properly"
- 75 percent of the store managers and shoe fitters included in the survey recommended hard sole shoes for both pre-walk and first-step wear.
- Fewer than 10 percent of the store salespeople and fitters said they had any training in the fitting of infant or children's shoes.
- Only 22 percent of the parents reported receiving advice or guidance from their physician regarding infant or children's shoes—and usually only when asked.

These are primitive conditions and attitudes when the foot is at its most vulnerable stage. But under prevailing practices, the infant foot is usually predoomed to a high-risk life ahead.

Surveys reveal that, for parents, the single most memorable event for them during an infant's life span is its first steps. Many mothers feel a deep emotional response at this moment because it signifies a silent declaration of independence: the child in charge of its own mobility and no longer totally dependent on the mother. It becomes the second cutting of the umbilical cord. Many parents commemorate this auspicious moment by having those first shoes bronzed for posterity.

With those first steps the infant is now ready for prime time. So onto its feet go its "first-stepper" shoes. And suddenly, the infant, having successfully launched its walking career barefoot, finds itself struggling to maintain balance and locomote with stiff, constrictive, alien objects on its feet. It labors to take "normal" steps with shoes on—a physical and biomechanical impossibility because the "foot" steps and the "shoe" steps are two alien motions and opposing forces. (Fig 13)

First, the shoe's soles, whether leather or other materials, are one-fourth to three-eighths of an inch thick. They automatically prevent 80 to 90 percent of the child's normal flex angle, 55 to 65 degrees at the ball. With shoes on there is very little heel-to-ball movement, thus denying the foot its normal step sequence. The steps are pancake-like, seriously hampering the gait mechanics.

The thick soles commonly used on infant shoes and sneakers are an absurdity. Infants never wear out their shoe soles. The like-new condition of the worn infants' shoes encourages many parents to delay purchase of new shoes, resulting in the common outgrown-shoes conditions.

Infant hightops and sneakers share another foot negative. The top rim of the shoe hugs the foot with a snug Velcro strap, lacing and double knotting. This prevents entry of air or evaporation of foot moisture. The result: hot, damp, unhygienic, uncomfortable inside-shoe climate. These same conditions usually continue into the tot and older child stages, especially when hightop sneakers are worn. The padded shoe tongue is sup-

Continued on page 96

posed to provide a buffer zone against the tight lacing. But it often encourages the parent to lace the shoes even tighter so that the tongue can "grip" the foot. (Fig. 13)

Corrective Shoes

Between 1930 and 1970, shoes for children were often heavily medicated with a variety of "therapeutic" features promising to correct or prevent problems of the growing foot: excessive out-toeing or in-toeing, pronation, gait faults, arch development, etc. Many shoe manufacturers and retailers assumed an almost evangelical zeal with this gospel. Scores of articles appeared in newspapers and magazines preaching the new biblical text of "proper" shoes to assure healthy foot development.

The directly involved medical practitioners—podiatrists, orthopedists and pediatricians in particular—adopted and preached the new gospel from their own pulpits. So ubiquitous was the movement that if a child wasn't wearing such shoes, the parent was made to feel guilty of child neglect.

The shoes were mostly oxford types, heavy and inflexible ("sturdy" was the favored term) and carried a cargo of "corrective" features such as arch lifts, anti-pronation inserts, extended counters, foot "balance" features, metatarsal padding, wedges, steel shanks, high and rigid backpart stiffeners, waist and instep reinforcements, extended soles, and various others. Each was presented as a significant advance usually stemming from "extensive research". The ingenuous medical practitioners and a malleable public became devoted disciples of the new holy creed.

In March 1948, the Federal Trade Commission, viewing the alarming spread of advertised claims for children's and adults' "health" shoes, launched its Orthopedic Shoe Industry Investigation. Included were dozens of children's shoe manufacturers and brands. Under the probe, not a single manufacturer was able to present valid evidence for its advertised claims of "health benefits" to the shoes. And not one could show evidence of any viable research facility or program behind the shoes. The so-called therapeutic and corrective shoes were, in short, a huge hype and hoax.

The FTC then ruled that in the future, no shoes could carry such labels as "corrective" or "health" or "orthopedic" without providing tangible evidence of such therapeutic benefits. While the ruling largely eliminated the former gross advertising claims, it did not, however, eliminate the continued use of "corrective" features in the shoes themselves, nor the shoes being sold for "healthy child foot development".

But a much more devastating blow was delivered against this footwear by Dr. Lynn Staheli, an orthopedic pediatrician at the Children's Orthopedic Hospital and Medical Center, Seattle. His milestone paper appeared in 1981 in Pediatrics. It presented an array of clinical evidence against corrective-type footwear for children of any age. The nation's pediatricians and orthopedists boarded his train. Similar and confirming papers by orthopedists and pediatricians followed. The "anti" voices received strong momentum as the national media gave wide exposure to the medical opposition to corrective shoes for children.

Significantly, throughout this medical uprising the official voice of the APMA remained silent.

But was this sudden medical uprising about children's footwear a mere tempest in a teapot? Where had the doctors been during those many prior years?

It was here, in 1981, when the U.S. Department of Health, Welfare and Human Services decided to step in to establish a sense of balance. While Staheli had delivered a strong blow against corrective shoes, he at the same time strongly advocated the wearing of sneakers by infants and children. On that score he proved as wrong as he had been right in his opposition to corrective shoes. An excerpt from the U.S. Department's public statement:

"Our studies show that the most criticized factor contributing to the controversy about orthopedic footwear is the lack of knowledge or

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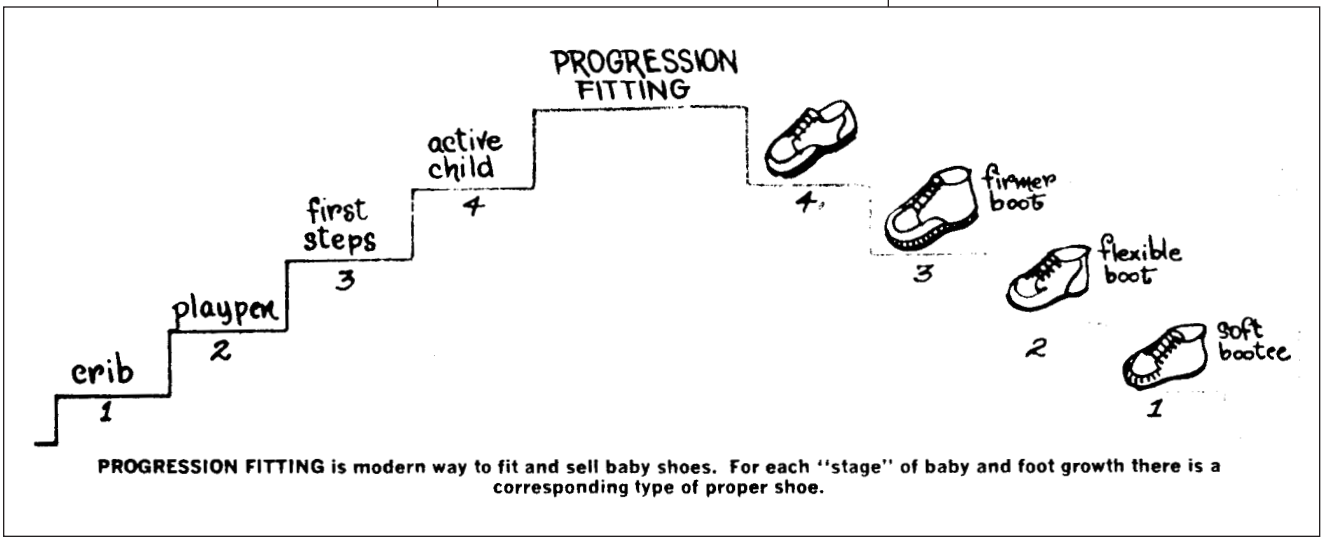


Figure 15: Shoe manufacturers have a special shoe for every stage from crib to tot

training of most medical practitioners and their ancillary role in foot therapy...The attending physician or medical specialist is not normally schooled about footwear. Consequently, many foot problems could have been prevented or more effectively treated had the involved physician had a better knowledge of the foot/shoe relationship."

The long tradition of children wearing shoes dates back to the pre-Christian era as a matter of social status. The poor went barefoot as a matter of economic necessity. Slaves were forbidden to wear shoes as a mark of lowly status. Thus, shoe wearing was a distinguishing mark of economic class and social rank. Children, as "property" of parents, reflected the economic and social class of the family. (Fig. 15)

When Theodore Roosevelt and his American troops stormed the hills of San Juan in the early 20th century to annex Puerto Rico from Spain, one of his first steps to raise the economic level of the new colony was to require that every school child own a pair of sturdy leather shoes. This same ruling was later adopted by the governments of Mexico, Bolivia and other Latin American countries.

Immediately after World War II when much of Europe lay devastated by the massive bombings, one of the "essential exports" under the Marshall Plan were shiploads of children's leather shoes as a visible mark of economic and social recovery.

Anti-Shoe Rebellions

Civilized nations and societies have long had an obsession about covering the foot as though it were an exposed sexual appendage requiring a covering as a mark of modesty and propriety.

During World War I at American boot camps many of the young men draftees arriving from impoverished rural areas of Arkansas, Kentucky, Tennessee and other states where shoe wearing was a rare experience for rural children, were assigned their first boots. Despite the large selection of boot sizes, the fittings proved largely hopeless due to the severe shape conflict between foot and shoe and the constant severe pressures. The young men limped around in pain and many became casualties during the marching and other rigorous drills. Appreciable shares of the men were discharged as "unsuitable candidates" for military service. A similar experience, though to a lesser degree, occurred during World War II—despite the availability of sizes up to 22 and widths up to EEEEEE. The natural foot and the boots were incompatible. (Fig. 16)

The barefoot Sikhs of India have long been reputed for their soldiering and bravery in battle. Early during World War II when India was still a British colony, the Sikhs were inducted into the British armed forces and fitted to the "sturdy"

Continued on page 98

British boots. After walking a bit they discarded the boots, refusing to wear them, citing pain and restrictive gait. The British, threatened with a mass rebellion, succumbed and made an exception, allowing the Sikhs to go barefoot in the traditional manner. The Sikhs went on to post records of remarkable soldiery and bravery during the war.

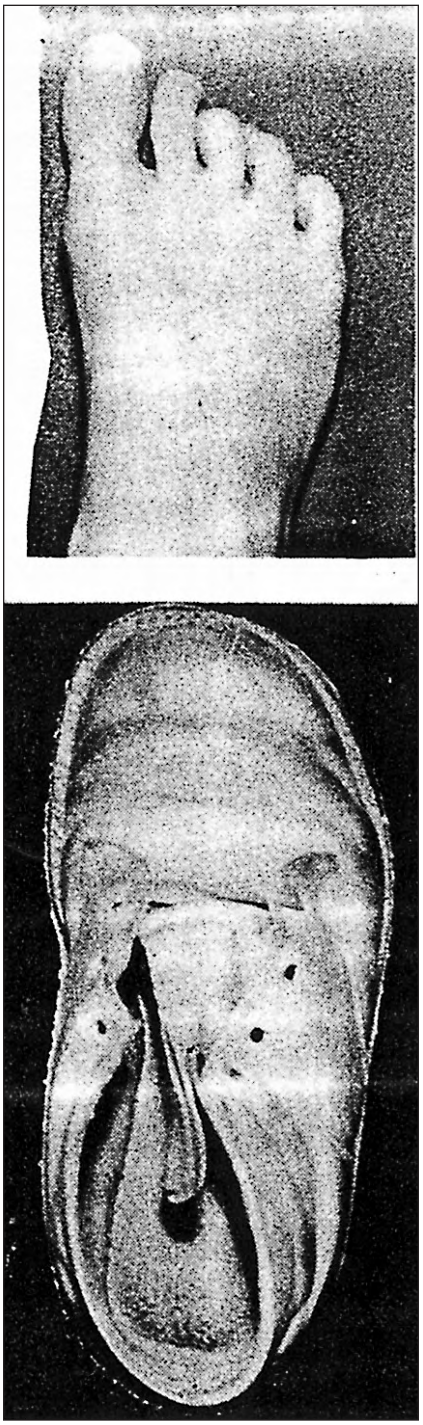


Figure 16: Child's deformed foot at age six—and equally deformed shoe from foot/shoe conflict

These reflect the identical experience of the infant whose virginal feet are being fitted to their first pair of shoes. The infant cries rebelliously, bunching its feet like a fist and otherwise resisting efforts to cage and imprison its feet and deny them their natural freedom.

What these experiences clearly demonstrate is that if the foot is permitted to reach adulthood unspoiled by shoes, the foot will be a quite different object anatomically and functionally than the foot shod from infancy into adulthood. Hence the obvious conclusion: In any shoe-wearing society there is no such thing as a natural or "normal" foot anatomically and functionally. (Fig 17)

This explains why the average shoe wearing foot has few problems fitting into conventional shoes, in contrast to the difficulties experienced by the habitually unshod foot fitting into the same shoes. The shoe-wearing foot has been anatomically conditioned from infancy to acquire the faulty shape to adapt to the faulty shoe. This contradicts the rule: you can't fit a square peg into a round hole. But you can. You simply shave the corners or edges of the square peg until they are rounded, and the once-square peg fits neatly into the round hole. This is precisely what happens to all shoe-wearing feet. So we arrive at the deceptive illusion that all once-square-pegged feet are "normal" because they fit into the round hole.

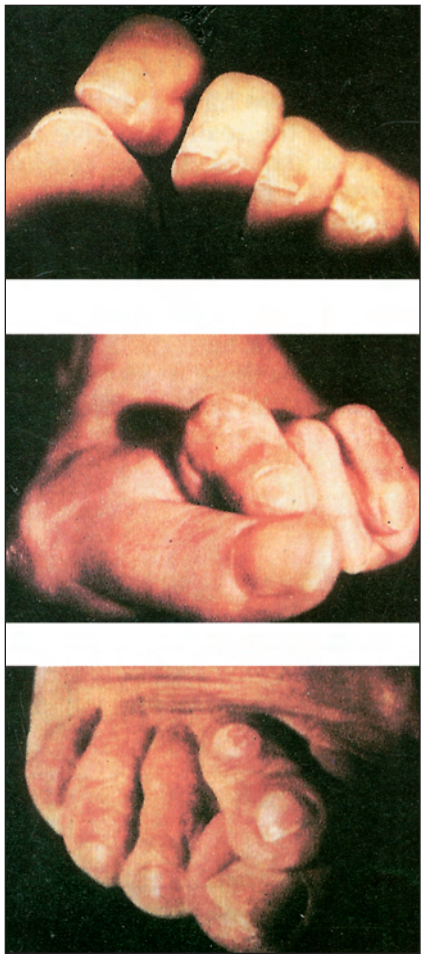


Figure 17: The ravages of the aging foot after a lifetime of shoe-wearing.

Are There Alternatives?

If infants' and children's shoes contain far more negatives than positives, is there an alternative? Yes. And ironically, it's as old as mankind itself.

Shoeless

The very word itself brings an automatic rebuff from many or most medical practitioners—and certainly an appalling idea in the view of the shoe people. Among the many negatives cited:

- It's impractical in modern society. It's uncivilized.
- It's unsanitary and unhygienic.
- It exposes the foot to such natural hazards as sharp objects on the floor.
- The foot needs "support" against the hard floor and other surfaces.

None of the above has any validity. Our comments here will apply only to infants and children up to the age of puberty.

In Japan and other Asian countries it has long been the custom to remove ones shoes before entering a home, including one's own home. The same custom is being used by an increasing number of enlightened American families. It is one of the most civilized of customs.

The idea of "unsanitary" or "unhygienic" bare feet is far more myth than fact. Most indoor dirt and toxins are brought into the home by clothing, and chiefly by shoes, which are the most unsanitary article of clothing we wear.

The American Leather Chemists association has cited that a pair of new boots contains a concentration

Continued on page 99

of chemicals and chemical compounds that comprises "a small chemical factory". These include the thousands of chemicals used in the leather tanning and processing, in the shoemaking process, along with those contained in the numerous shoe components and materials. All are exposed inside the home or office, especially when combined with and agitated by inside-shoe heat, perspiration and bacteria. Basing his estimates on test studies, Dr. Edward Pinckney states in the Journal of the American Medical Association that the average 9x12 house rug contains 12 billion "hostile germs" and that over 90 percent of them arrive there via shoes. (On the front door of his own home is posted a sign: "Please remove your shoes at the front entry")

Throughout the day our hands accumulate a wide range of toxins. We resolve this by frequent hand washing—not by requiring people to wear protective gloves.

Once introduced, the shoeless-at-home habit is eagerly adopted by juveniles because of the "freedom" feeling. Having acquired the shoeless habit up through age 12, most children will continue with it well into the late teens and often beyond. The obvious consequence would be a marked improvement in child foot health and continuing into the adult range over the subsequent years.

But wouldn't this be counter-productive for podiatry by reducing the incidence of foot ills in the mature-age years? No. A half-century ago the nation's dentists faced the same dilemma when fluoride was added to the water supplies of cities and towns. Today, juvenile dental cavities have virtually disappeared and public dental health has taken a major step forward. Yet, significantly, the dental profession continues to thrive as new avenues of dental care open up. Fluoride did not prove to be self-defeating for the dentists.

Where To From Here?

It has long been assumed that children's footwear is generally healthful because it allows for normal foot development by avoiding the "sins" of adult footwear (high heels, pointed toes, vanity, too-small sizes, fad

Continued on page 100

Figure 18: Feet of an 87-year-old Japanese woman who through her lifetime has worn only loose sandals or no footwear at all.

fashions, etc.). This is seriously naïve.

As a result, little if any serious attention or research has focused on child foot health and the foot/shoe relationship. Newspapers and magazines periodically publish articles on child foot care and the importance of "proper" shoes. Most of these are a re-hash of prior articles, often including quotes by "authorities" (usually podiatrists) who spout the traditional mantras about grow-room allowance, arch and foot support, correct fit, etc. Meanwhile nothing has changed. Today, most children enter adulthood with the same health-handicapped feet as children of generations past. And the incidence of adult foot health is also essentially unchanged from that of a century ago.

Over the past 50-100 years virtually every branch or specialty of medicine has made substantial contributions to disease prevention and health improvements in its field. Only podiatry has failed on this score. While podiatry has made appreciable advances in the treatment of foot disorders, it has added almost nothing to the science of prevention.

This vacuum of neglect has spawned a horde of commercial predators promising a broad range of over-the-counter and mail order nostrums providing relief or cure for every conceivable foot disorder or distress, and costing the American public an estimated $40 billion a year. This is an inevitable natural law: the greater the vulnerability of the prey, the more aggressive and successful the predators who feed on them.

In this matter of child foot health we are not confronted with some profound and complex problem of astrophysics or esoteric technology. Nor does it involve heavy financial investment for research. It is, instead, a visible problem with a simple and viable solution, which can have a major impact on both child and adult foot health. Resolving the problem should be exclusively the responsibility of podiatry as the official guardian of the nation's foot health. If podiatry continues to ignore it as it has for generations, then one day the project will be undertaken by the orthopedists or pediatricians who will then be hailed for their public service, leaving the podiatrists embarrassed for their delinquency of public duty.

Here are two proposed steps for launching the initiative:

1) A mass professional policy urging parents to keep their infants shoeless through the first three years. This would give the foot a healthy head start.

2) Urge all parents to adopt the shoeless-at-home-rule for their children through age 12, and suggesting that the parents apply the same rule or habit to themselves.

Information citing why this shoeless-at-home policy will be of major foot health benefit, present and future would support the recommendations.

The APMA should assume leadership here by taking an official stance and using the muscle of its public relations sector. Podiatrists would supplement this by similar advice and guidance to office patients. This could be supplemented on the local level by podiatrists using their authoritative voices via local newspapers, TV, or talks before groups.

The public press would eagerly adopt and convey this back-to-nature idea. Instead of "shoeless" equating with low economic or social status and an unsanitary condition, it would now be seen as "cool" and sensible and an insignia of the educated and well informed.

The majority of orthopedists, pediatricians and family physicians who, like the podiatrists, have long largely ignored the foot/shoe relationship in children, would likely adopt the shoeless-at-home movement as an idea whose time has come.

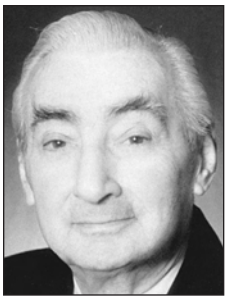
Today, excluding the 2,900 hours of bedtime, shoes are on children's feet about 8,400 hours a year. The shoeless-at-home habit would cut shoe wearing another 3,000-5,000 hours, (including non-school and added at-home hours), leaving the foot shod only about 5,000 hours out of a total 11,300 hours for the year. That would be a huge gain for child foot freedom—and a major step toward improved public foot health.

The footwear industry would, of course, strongly protest against the shoeless-indoors movement. They would present all the shopworn arguments about the importance of shoes for "healthy child foot development." But the defense would collapse for lack of supporting evidence.

However, manufacturers and stores would not be denied their livelihood. Shoes have long been worn for fashion, ornamental, and peer status reasons. When children reach the age of puberty they feel the pull of peer pressures and sex attraction, and the lure of fashion becomes a powerful magnet. So, while teens would likely continue to go shoeless at home, they would adopt and wear the peer fashion footwear outside. But by then healthy child foot development will have gotten off to a vigorous head start—something that rarely occurs in any shoe-wearing society.

From all this may emerge a huge serendipitous bonus. The shoe manufacturers might be forced or inspired to reappraise their traditional lethargy and apply serious research to the child foot/shoe relationship. We could then begin to see footwear that does not deform and defunctionalize growing feet. They could, for the first time in history, begin to make a genuine contribution to healthy child foot development.

Podiatry must now begin exchanging the old platitudes concerning the foot/shoe linkage in child foot development for the new realities. It must confront the simple premise that children's feet fare better without rather than with shoes. Only then can it make rightful claim to being the guardian of the nation's foot health, beginning with children. ■



Dr. Rossi, a shoe industry consultant, has written eight books and over 400 articles, including extensive additions on leather and footwear in Encyclopaedia Brittanica.