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The Art of Medicine and the Lowly Foot: Treating Aches, Sprains, and Fractures in the Ancient World

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THE ART OF MEDICINE AND THE LOWLY FOOT: TREATING ACHES, SPRAINS, AND FRACTURES IN THE ANCIENT WORLD

By Georgia Irby-Massie

"Because of the water, everyone in Troezen experiences foot maladies." Pliny the Elder *Natural History* 31.11

With 26 bones, 33 joints, over 100 muscles, tendons, ligaments, and a delicately balanced system of nerves, the human foot is a mechanical marvel. No less than we, Greek physicians were concerned with what could so easily go wrong with the foot. Consequently, the anatomy and pathology of the foot received attention in most Greek medical treatises, organized systematically, *a capite ad calcem*, beginning with the head and methodically working down the body to the feet (see Fig. 11).

From the Hippocratics onward, hands and feet were considered analogous in construction and purpose, as instruments of prehension. Just as concavity and variety of articulations allow the hands to clasp objects of every shape easily, so human feet, similarly flexible and concave, "can stand firmly in every sort of place" (Galen, *On the Usefulness of the Parts* 3.5). The human foot "is specially suitable for an intelligent animal" (Galen 3.4), and the anatomy of both leg and foot contributes to practicing *technae* (technical skills) – building, scrambling up yardarms, blacksmithing, etc. Round, hard feet (hooves) might render our feet swifter and less liable to injury, but the elongate, broad, soft character of the human foot, divided into toes, is suitable for walking on a variety of surfaces. Even softness is advantageous, since sandals, which protect feet like "solid hooves," exist for every situation, tattered footwear is easily replaced, and it is occasionally better to go barefoot. The foot's length and breadth help support the bipedal body when standing, walking, and running. Even the humble toes are useful in maintaining balance. Galen observes that frostbite victims who have lost toes might be able to walk with difficulty on smooth ground but they can never walk over rough terrain (3.5).

Although the complex and flexible design of both hands and feet contribute to intelligence in humans, this same complexity renders the foot prone to mishaps, and Greek physicians describe treatments for many common podiatrical complaints, including sore and swollen (or gouty) feet, callused and cracked feet, sprains, and dislocations.

Rubs and plasters for achy feet were compounded from ingredients chosen for their perceived medicinal properties. Amarantos the Grammarian (first century B.C.) recommends a sore foot remedy that employs thirty-two ingredients including, analgesics (frankincense; Fig. 12), astringents (gentian), anti-inflammatories (butcher's broom, St. John's wort), and warming botanicals (yellow iris, cardamom, eryngo, ginger: Galen *About Remedies* 2.17 [14.208-209 Kuhn]). Celsus preserves a twenty-one ingredient emollient attributed to Andreas (third century B.C.), recommended for relieving pain of all kinds, including achy joints and painful feet (*pedibus dolentibus*: 5.18.7). Pliny reports simpler remedies for sore feet: snails ingested as an analgesic drink (30.77); ashed remains of burnt hen or pigeon dung, presumably rubbed on the sores (30.80); plasters of cypress leaves pounded with soft bread and Aminean wine (a northern Italian variety described by Cato and recommended for a variety of health complaints including kidney stones) for sores on the feet (24.15); and elm leaves crushed and mixed in water as a plaster for swollen feet (24.49).

Clement of Alexandria (third century A.D.) commends the beneficial effects of ointments for the feet according to Christian ethics: "Rubbing the feet with warming or cooling unguents is practiced because of its beneficial effects" (*The Schoolmaster* 2.8). According to Clement, ointments applied for practical reasons do not *per se* provoke passion since the art of healing is divinely manifested (early Christians strove to avoid pleasure for its own sake):

> unguents have been given manifestly for utility, not for voluptuousness. For we are by no means to care for the exciting properties of unguents, but to choose what is useful in them, since God permitted the production of (soothing) unguents for the mitigation of men's pains. (*The Schoolmaster* 2.8)

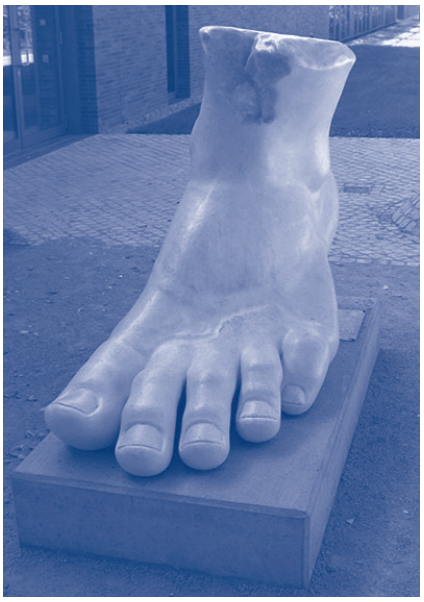

Fig. 11. The health of the foot was of great interest to the Greeks and Romans. This colossal foot is part of the remains of a statue of Constantine. Used according to *GNU Free Documentation License*. Image source: http://commons .wikimedia. org/wiki/File:Foot_of _colossal_statue_of_Constantine_I.jpg.

Clement even employs etymological wordplay to connect the Christian god to analgesic oils: "the oil (ἔλαιον) is the Lord Himself, from whom comes the mercy (ἔλεος) which reaches us" (*The Schoolmaster* 2.8). Oils used medicinally to rub achy feet are agents of the Christian god whose mercy alleviates pain in the feet.

For cracked and callused skin on the feet several treatments are recorded. The pharmaceutical encyclopedist Dioscurides (first century A.D.) includes healing cracked skin (ῥαγάδες) on the feet as among the medicinal effects of raw pitch (1.72.2), chaste-tree (1.103.3), and common polypody, a "many footed" fern whose very name may have recommended it as an effective treatment for foot complaints (4.186). To thin calluses on the soles of the feet, Dioscurides suggests a poultice of anti-inflammatory wheat (2.85.2). The Roman medical encyclopedist Celsus (first century A.D.) endorses a soothing, active, and repressant (*lene, vehemens, reprimens*) plaster compounded from copper scales, lead heated but not melted (calcined), cadmia (zinc oxide), and

wax, with "enough rose-oil" to yield a soft consistency (5.28.5). For a particular strain of the skin infection *impetigo* – which attacks the nails, renders the skin on the feet hard, chapped, white, and scaly, and is altogether "quite incurable" (fungus?) – Celsus records two therapies based on a treatment for scabies and compounded from lupin meal, nitron, liquid pitch, liquid resin, and vinegar (5.28.16-7). Pliny cites numerous outlandish remedies: pastes of pitch and ashes of burnt scorpion shells for cracked and abscessed feet (24.39, 32.34); green lizard's blood for chafed feet (30.80); raw oysters for toes aggravated by cold or humidity (chilblains: 32.65); and for corns (*clavi pedum*), an application of mule's urine, sheep's dung, green lizard's blood, earth worms, or spotted lizard's heads (30.80).

Medical treatises preserve numerous gout-therapies, likely because gout was considered a disease of affluence. Rich diets and lack of exercise among the Roman elite contributed to the accretion of uric acid around the joints, especially the ankles. This in turn resulted in painful swelling. *Ποδαγρᾶν* (*podagran*, "to suffer from gout") derived from the Greek noun for foot (*πούς*, *ποδός*) further emphasizes the disease's virulence on the feet. Gout afflicted Sulla who visited the hot springs "suited to the cure of diseases" in Euboea (Strabo *Geography* 10.1.9; Strabo does not here specify gout), as well as Agrippa, who soaked his painfully swollen gouty feet in hot vinegar (Pliny the Elder *Natural History* 23.58). Neither author indicates whether or to what degree the cures worked. Dioscurides' litany of substances to allay the symptoms of gout include common and exotic ingredients to relieve pain (cardamom: 1.15.2; Fig. 13), reduce swelling (willow: 1.104; land snails: 2.9.2; gillyflower: 3.123; opium poppy: 4.64.4; henbane: 4.68.4), draw fluids away from the joints (cyclamen: 2.164.3), or warm the affected area (pennyroyal: 3.31.2; Fig. 14). Jacob Psychrestus, "The Cooler," who prescribed cold baths for numerous diseases (fifth century A.D.), significantly employed autumn crocus, the source of *colchicine*, the fundamental drug of modern gout-therapy (Scarborough *Encyclopedia of Ancient Natural Scientists*, edd. Keyser and Irby-Massie, 2008: 429-30).

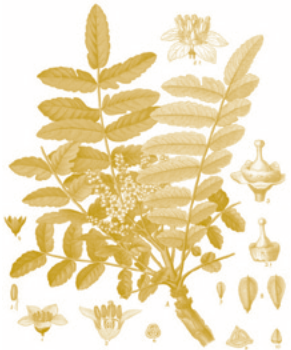

Fig. 12. Frankincense comes from the Boswellia scara plant.

Sprains, dislocations, and fractures of the feet were treated similarly with plasters, compresses, and bandages, secured tightly, with dressings replaced on the third day. Patients were urged to report their bandage's relative slackness or tautness. Those who disregarded medical advice failed to recover fully.

Footcare has changed little from the techniques used in the ancient world.

> Often the pain puts (some patients) in mind of the injury; and deservedly, for the feet sustain the weight of the whole body. When they walk about before they are whole, the joints which have been dislocated are cured incompletely; hence, while walking about, they have pains in the leg from time to time. (*Hippocratic Fractures* 9)

One Hippocratic author graphically recounts sprains resulting from violent jumping (*Fractures* 11): "the bones are separated, and the veins pour forth their contents, owing to the contusion of the flesh surrounding the bone, and swelling and much pain ensue." The relatively large heel bone extends beyond the line of the leg, connects with important veins and tendons, and joins the leg's back tendon to the foot. The injury should be treated carefully with compresses and "particularly good and appropriate" bandages applied by an experienced bandager. A poor bandaging job may result in gangrene, "an impediment for life." Meticulously explicated is the procedure for wrapping a severely sprained ankle (*Fractures* 11):

> making many turns of the bandage around the heel, sometimes carrying it to the edge of the foot, sometimes to the middle, and sometimes around the leg; and, in addition, all the surrounding parts are to be bandaged in this direction and that. . . and the compression should not be too tight, but we should use many bandages, and it is better also to administer hellebore the same day or the next; and the bandages should be removed on the third day and reapplied.

Further, the foot should be kept elevated "generally raised a little higher than the rest of the body." The regimen has remained unchanged for 2,500 years. Dioscurides cites narcissus root, crushed with honey and applied topically, explicitly to treat sprained ankles (*στέμματα σφυρῶν*: 4.158.2) but elsewhere catalogues remedies for sprains in general: analgesic *calamus* (1.85); anti-inflammatory walnuts plastered with honey (1.25.1); pungent, warming (and aphrodisiac) red Purse tassels (*muscari comosum*, a variety of grape hyacinth) from Libya (2.170.1); cooling fleawort (4.69.2); diuretic black bryony (*tamus communis* L., a poisonous climbing woodland plant; 4.183.2).

Dislocations and fractures were potentially lethal, and setting them was especially troublesome in the case of fingers, toes, feet, and hands (Celsus 8.25). The anonymous author of Hippocratic *Joints* blithely declares: "if the leg is dislocated and projects through at the ankle, the patient usually dies; don't bother reducing the lesion. Few patients last more than seven days, and they die from spasm (tetanus). Gangrene might set in" (*Joints* 63).

The Hippocratic method of correcting congenital club-feet in young children resembled their procedure for setting dislocations. With pressure and counter-pressure applied to the bones, the feet were manually realigned and then dressed with cerate (with a consistency between an ointment

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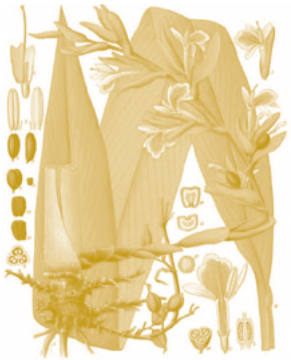
Fig. 13. Cardamom was one of a number of plants used by the Greeks and Romans to reduce pain.



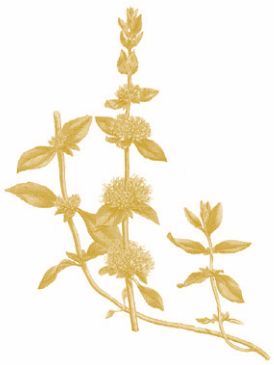


Fig. 14. Pennyroyal is a member of the mint family.

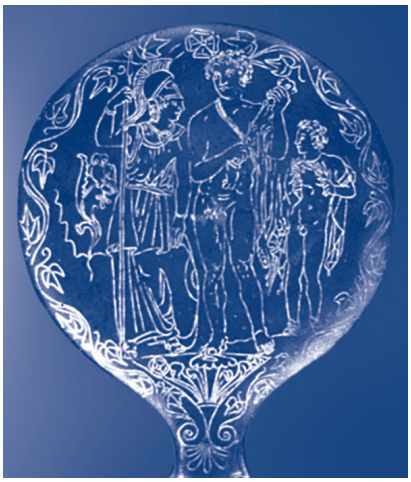


Fig. 16. Etruscans decorated the backs of mirrors with many images. This Etruscan mirror features Hercules and Athena on the reverse. Madrid, Archaeological Museum. Credits: Barbara McManus, 1985. Images source: http://www .vroma.org/images/mcmanus_images /herc_mirror.jpg.

an intriguing examination of echoes of Etruscan art in Renaissance artwork. The authors suggest, for example, that one can trace Etruscan mythic concepts in the work of such later artists as Michelangelo (1475-1564) and Signorelli (1445-1523).

An appendix detailing the Etruscan pantheon arranged according to the gods' Etruscan names and Greek equivalents (if these exist), is included. Supplied with additional illustrations, this useful addition summarizes what is known of each deity from Greek sources, then provides data on his or her Etruscan persona along with references to the places in the text where the deity is depicted. A tabulated chart of gods' names follows: the Etruscan, Greek and English versions of Latin divine names. The authors have also provided a brief "Suggestions for Further Reading" containing some excellent introductory studies for the interested reader. A thorough index concludes this very well-written and informative text.

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and a plaster) and bandages, which acted like casts or braces to restore the bones to proper alignment (*On Joints* 62). Moulds, cerates of resin, lard, and yellow wax, and bandages or sandals fitted with sheets of lead were also employed to ease the bones of the feet back into natural arrangement (Hippocratic *Instruments of Reduction* 32).

Although treatments for sandal-chafed feet are noted (ashes of old shoes: Pliny the Elder *Natural History* 30.80) and although Greco-Roman sandals provided no arch-support, the open-weave and ventilating nature of ancient footwear helped protect against infections such as athlete's foot and trench foot. Bunions may also have been less common because ancient footwear was flat-heeled and open-toed. The textual evidence is vague on these and other questions. How, for example, did Roman soldiers, who marched long distances with heavy packs, treat fallen arches? Even in his guidelines for military medicine (*Epitome of Military Science* 3.2), the fifth century A.D. writer Vegetius is silent. Nonetheless, concern with universal and timeless complaints about feet is clear. Sore feet, calluses, swelling, sprains, and fractures were treated with emollients intended to restore humoral balance (removing excess liquid, restoring heat), splints, compresses, bandages, and medicated wraps.

Remedies focused on treatment rather than prevention, and they varied widely, ranging from simple to complex, from sensible (elevation of sprained ankles) and proven (vinegar soaks) to magical (ashes of old shoes). Greek physicians treated symptoms rather than causes. Thus, while Pliny the Elder may have observed that foot maladies were caused by the water at Troezen (on the northeastern edge of the Peloponnese), he does not explain how these ailments occurred, whether by drinking the water or wading in it, nor does he expound upon which foot ailments are particularly noted at Troezen, nor does he comment on the real or imagined potency of cures listed throughout his encyclopedia. Instead, Greek medical writers and encyclopedists tantalize the modern reader with *seriatim* cocktails compounded with ingredients from the common to the bizarre for soothing achy feet or assuaging swollen ankles, but they rarely remark on the efficacy or popularity of a specific treatment. Greek medicine, nonetheless, was deeply informed by theory and observation, and foot therapies reflected both approaches. Humoral theory dominated gout therapy and treatment of skin complaints. Meticulous knowledge of anatomy governed the rehabilitation of sprained, fractured, or broken feet and ankles. Remarkably, little has changed regarding attitudes about feet and regimens of foot care: modern medicine employs rubs, wraps, and splints strongly resembling those found in the pages of Hippocrates and Galen; and these hard working appendages usually receive little attention until something goes awry.

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