

## “Taking the waters”—springs, wells, and spas

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*[O]ne of the deepest and most enduring preoccupations, both of the sick and of the medical profession, from the baths of antiquity through to the Victorian deluge of “hydros,” has been water. . . . the pernicious potential of standing waters, humid vapors, excessive rainfall, pestilential miasmatic fogs, and subterranean aqueous abysses . . . the curative powers of water . . . engendering ferocious local disputes as to the desirable mineral constituents of particular healing springs, wells, streams, and spas. . . (1)*

WE ARE ALL DEPENDENT on a continuing supply of fresh water from the day we are born, when the “water breaks,” to the day of our death, when we cross the river Styx. Water, whether drawn from a stone by Moses, or spurting from the earth in the Fountain of Youth, has been celebrated from time immemorial for its capacity to clean our physical and moral selves—think of Noah’s ark in the cleansing flood and the rite of baptism in the Jordan’s water. Roy Porter traced its pharmacology:

*In Homeric times, baths were used primarily to cleanse and refresh. By the time of Hippocrates, however, baths had acquired both general and specific healthful and healing properties. The bodily humors could be heated, cooled, moistened, or dried by a combination of hot and cold baths; thermal baths soothed chest and back pains in pneumonia, and promoted the secretion of urine; cold douches relieved swellings and painful joints; and aromatic vapor baths were advised for female disorders. Baths became a vital part of treatment, together with food, drink, rest, exercise, and drugs. The waters were also drunk, substituting for wine and meat at the sign of impending illness, as one of Asclepiades’ ‘common aids’; cold water was recommended for those with fever (1).*

During the Empire, Rome had thirteen aqueducts, 1352 public fountains, and eleven imperial *thermae*; there were 962 public baths available to the citizens of Rome during its imperial heyday. And nowadays, the King’s Bath, in Bath England which was first developed by the Romans, still delivers about a quarter of a million liters of water a day at a temperature of 46.5°C. The water in the King’s Bath contains some thirty minerals, including calcium, magnesium, potassium, iron, lead, and strontium, tastes of sulphur and bismuth, and is slightly radioactive. Immersion was prescribed for rheumatic and urinary diseases, and drinking was prescribed for internal ailments.

Generally, in Roman occupied Briton, the baths opened at 1 PM. After exercising, the bathers would undress and enter the warm room (*tepidarium*) to acclimate before moving on to the hot room (*cal-*

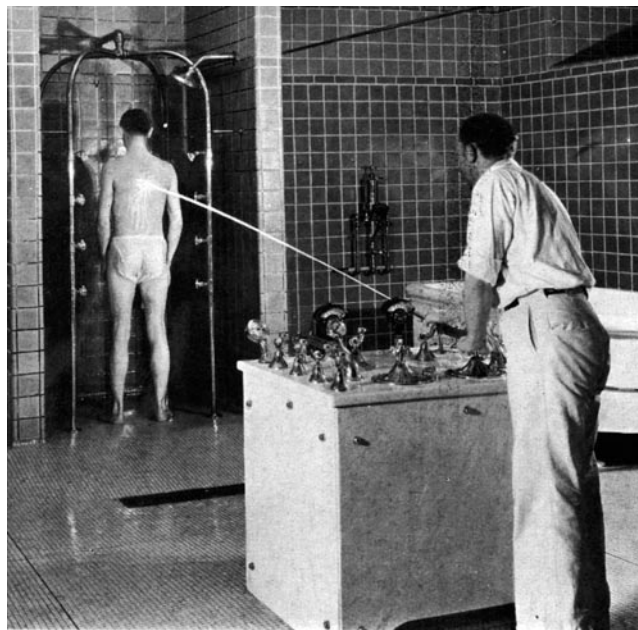


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*darium*). This was followed by a sweat room, oiling, massage, and a plunge into a cold pool (*frigidarium*). With the dissolution of the Roman Empire in the west, these elaborate establishments (Bath and others) fell into disrepair and relative disuse. But the major springs did not disappear, and, despite the early Church’s general disapproval of bathing (and swimming), which, like sexual pleasure, came to be associated with the devil, the baths and bathing continued throughout medieval times. As can be seen in a number of miniatures (*e.g.*, “The Fountain of Youth” illustration from *Codex de Sphæra*, Modena, 15th century, reproduced in Croutier), the bath was often shared by both men and women and done with little, if any, covering. Even writing about Bath in the mid-18th century, it was noted that at the baths “. . . Modesty was entirely shut out of them, People of both Sexes bathing by Day and Night naked . . . (2)”

In Renaissance Italy, “taking the waters” was associated with gentlemanly ideals of rustic retreat, expressed within a pastoral mythology of leisure and pleasure. In 1553, a Venetian physician, Secco, urged his readers to “confirm and perfect ancient medicine . . . so that the baths . . . now

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at death's door, may be restored to public use . . . (3)" In 1581, Michel de Montaigne toured the baths of Italy in search of a cure for the stone. "Of twenty consultations there were not two in agreement, each doctor damning the other . . . (4)" When Montaigne visited the famous hot, sulphurous springs of Abano, the public bath was open to the elements and out of use in bad weather. Despite the conditions, Montaigne persisted: "I went back to drinking that [water] of the ordinary spring, and took five pounds of it. . . . I discharged some gravel . . . (5)" Michelangelo also used the Italian waters at Fiuggi, "which breaks up my kidney stone. . . (5)" Leonardo da Vinci used the waters at San Pellegrino.

In France and Germany, people were drawn to particular spas because of their reputations as centers of healing for specific problems. Forges was the haven of the nephritic and the infertile; Vichy and Bourbon were the resorts of the paralytic and apoplectic. Louis XIII and Anne of Austria went to Forges in their (successful) search for an heir; Mme de Sevigné traveled to Bourbon when, at age 50, an attack of rheumatism made her unable to bend her fingers and deprived her of the ability to write. The French baths were relatively crude, open to the air, unisex, and socially mixed. At the hot springs patients both bathed and drank; at the cold springs they only drank the waters. Generally, treatment was supervised by a physician which began with bleeding and purging, and ended with purging again. After an early start, most of the morning was spent taking the waters as prescribed. Patients then had a light dinner, an afternoon rest, an evening promenade, a light supper, and went to bed early. It was a sober and serious life, regimented and often humiliating. Mme. De Sevigné was disgusted at having to shower naked, and was not allowed to have her hair done before her morning dose of water:

*I started to shower this morning and it is a great rehearsal for purgatory . . . one is completely nude in this little underground place and there one finds a tube with hot water that a woman aims at different parts of her body. It is a very humiliating thing (6).*

The French spa had become a place of pilgrimage, retreat, and suffering, as well as being difficult to reach. Similar conditions prevailed in England.

Competition between the various baths stimulated chemical analysis of the various mineral waters. An early attempt (1730s) at a systematic analysis was published by Shaw (7). He described the topography of the spring, the physical characteristics of the water, and any spontaneous changes which occurred on standing. One sample was allowed to evaporate slowly and another was heated; the two samples were then compared. A third sample was distilled, the residue was filtered and crystallized, and the earths and salts were separated and tested. He claimed that an exact and instructive account could then be given of the contents and virtues of a particular mineral water. By the 1790s, Joseph Priestly and others were preparing artificial mineral waters. Beginning in the 18th century, companies were formed

that prepared and marketed such waters—the best known was that of Jacob Scheweppe, founded in Geneva about 1780. Waters claiming to resemble those of Carlsbad, Ems, Marienbad, and Vichy were available by the mid-19th century. In addition, evaporation to obtain the dissolved constituents provided an easily transportable commodity that was stocked, sold, and reconstituted for home use. Epsom salt, for example, was first extracted in the 1680s and sold (and continues to sell) in large quantities. Water analysis stimulated the improvement of inorganic chemical analysis and provided a rationale for use of the baths medically—the appeal to science presumed that it gave access to an objective reality.

New "scientific" techniques also strengthened the appeal of the spas. A "water-cure," first developed in Silesia, reached England by the 1840s. Gully's regime at Malvern was based on the idea that faulty blood supply could be corrected by the application of cold water to the skin. In addition to showers and baths, there were wet-sheet packing, steam baths—all reinforced by a regime of early rising, multiple short walks, plain food, and water to drink. Gully promised "pure air, pure water, and dietic [sic] rule (8)."

In March of 1849, Charles Darwin consulted Gully for his distressing symptoms which included dizziness, nausea, retching, boils, and headaches which had not responded to traditional treatments. Gully was puzzled, but agreed that dyspepsia was the culprit. This term then included ideas of physical weakness, loss of appetite, and depression of spirits, morbid despondency, and gloom—exactly the illness Gully "cured" by revitalizing the inner organs. The digestive organs irritated the brain and spinal cord and these in turn irritated the stomach. As Darwin put it, he ". . . thinks my head or top of spinal chord cause of mischief (9, and see below)."

Darwin, his family, and servants remained until the end of June. For the first ten days he was rubbed with wet towels. He graduated to wet-sheet packing and the hot air bath. Wet-sheet packing was used for "lowering the energy of the brain," and was thought to be a powerful sedative (later, it had a long history of use in psychiatric hospitals). This was followed by a dripping sheet with which he was vigorously rubbed. Darwin also received the perspiration bath: "At present," wrote Darwin, "I am heated by Spirit lamp until I stream with perspiration, & am then suddenly rubbed violently with towels dripping with cold water . . . (10)" However absurd it sounded, he assured his friend Joseph Hooker, "I feel certain that the water cure is no quackery (11)"—as evidenced by four returns, other water cures, and sending a daughter for similar treatment. His treatment moved into the usual routine of regular showers, communal baths, and sheets and compresses. Gully also sent patients to the top of a nearby hill four times a day, a trek of seven miles, half steeply uphill. Darwin complained that he was turned into a walking and eating machine. However, he felt the cure ". . . has answered to a considerable extent: my sickness much checked and considerable strength gained . . . an astonishingly renovating action on my health (11)."

While the spas were also supported by the recommendations of other distinguished visitors, such as Charles Dickens and Thomas Carlyle, today we demand a properly designed outcome study. Such a study has been done of the waters at Bath. It has a large N, careful diagnostic grouping, a consistent treatment protocol, comparison groups, defined outcome measures, and “independent” raters. What makes it surprising is that it was designed and completed in the 18th century.

By the early 18th century, “Palsy after the Colic,” that is, paralyzes following attacks of severe, gripping abdominal pain and constipation, were distinguished from paralyzes the “consequence of Apoplexes, Epilepsies or Convulsions.” In 1713, the senior physician of Bath noted that this “colica pictonum” was particularly helped by the Bath waters. Color grinders, pewterers, chemists, painters, potters, plumbers, and printers had heavy exposures to lead and were known to suffer from colic, constipation, and paralysis. It was common knowledge that Bath was the place to go if one were left with palsy after severe colic. In 1737, Bath had a new hospital to serve the “deserving poor”—it offered free care in return for participation in a “trial of the waters.” Treatments would be regulated, carefully recorded, and results published. “[I]n this hospital every person will be under [the physician’s] government and direction in all circumstances regarding his health so that a few years will furnish more Histories of cases which may be depended on . . . (12)” Upon discharge, the patients were examined by an independent committee of doctors who decided on the final diagnosis and actual outcome of treatment. This was recorded along with the length of stay and personal details.

Sam Ariss was a 25-year-old journeyman painter from Birmingham who had had a weakness in his hand and been unable to work since Christmas 1752. Admitted in November 1753, he was examined when discharged in April 1754 by Dr. Moysey and Mr. Palmer. Their diagnosis was colica pictonum and he was certified as cured. Three other patients discharged at the same time were diagnosed as having rheumatism, nervous weakness, and colic with fits—all were judged “no better” (13). Annual reports from 1760 to 1879 consistently show high cure (45%) and improved (93%) rates for lead-related illness, but not for other illnesses. For example, in 1830 only 6% of paralyzes due to deformities of the spine, 11% of other paralyzes not due to lead (often following strokes) were cured, in contrast to 49% cure rate of cases due to lead poisoning (14).

There have been two modern contributions to these findings. In the early 1970s NASA scientists sat astronauts in water at 35°C. They noted a marked increase in urinary excretion of water, sodium, and calcium (15). Later, three lead workers with sub-clinical but high blood lead levels were similarly submerged. In all subjects there was a large increase in the rate of urinary

lead excretion during immersion. Had the old Bath protocol been followed, three times a week for 24 weeks, a significant proportion of the total body lead would have been removed. This presumed mechanism should not diminish the contributions of other aspects of the 18th century treatment—removal from the source of exposure to lead, good food, and exercise of wasted muscles in warm water. The high levels of calcium and iron in the Bath water, which was also drunk as part of the treatment, may also have helped decrease the toxicity of the lead present (16). Gerald Weissmann has suggested (personal communication) that a contributant to Darwin’s complaints might have been heavy metal poisoning. If so, he may have been right that the “water cure [was] no quackery.”

What of the baths today? Mineral waters are plentiful, and European ones often include mineral contents on their labels (*e.g.*, Vichy, Perrier, and of course, Schweppes). In addition, we have the “invented” waters—tonic for our gin, originally laced with quinine to treat malaria, and Gatorade with its electrolytes for fluid and electrolyte replacement during and after exercise. We have spas—The Golden Door, Canyon Ranch, and the crumbling Russian entitlements. We have health clubs with pools, whirlpools, and saunas; and we have California hot tubs and home bath tubs with built-in water jets. More central to American medicine, we have physiatry, orthopedics, and sports medicine prescribing whirlpools and swimming as non weight-bearing aerobic exercise for those with joint problems; and we have immersion in the Dead Sea for patients with psoriasis. In typical American style, there have also been malpractice suits discrediting the claims of specific waters’ medical effectiveness. Unfortunately, little, if any, of this is being subjected to the searching spirit evident in Bath in the 1730s.

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