

SANDROCK SPRING AND SHANKLIN SPA: CONTRASTING CHALYBEATE WATERS FROM THE LOWER GREENSAND OF THE ISLE OF WIGHT

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Chalybeate mineral springs in the Isle of Wight Lower Greensand were first recognised in the 17th Century although no development took place. From 1808 the virtues of Sandrock Spring at Niton were touted by a local physician, Thomas Laurence Waterworth. Chemical tests showed that it had high concentrations of both iron and aluminium. By 1896 another spring had been transformed into the grandly named Shanklin Royal Chalybeate Spa. Although patronised for a few years neither development prospered and little evidence of their existence remains today. The Sandrock Spring was derived from quartz sands of the Sandrock Formation whereas Shanklin Spa obtained its water from glauconitic sands lower in the succession within the Ferruginous Sands Formation. Iron concentrations of over 1000 mg/l were measured at Sandrock compared with 20-30 mg/l at Shanklin. The contrasting composition of the two springs results from the differing mineralogy of their host rocks; the presence or absence of carbonate controlling the concentration of iron in solution. The strongly acidic “vitriolated chalybeate” waters, such as that found at Sandrock, did not lose their iron as rapidly as the weakly acidic “carbonated chalybeates” found at Shanklin and were highly prized by spa physicians.

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INTRODUCTION

On the Isle of Wight, the presence of springs impregnated with minerals was recognised by early topographers (Worsley, 1781) and both sulphur and chalybeate springs were recorded in the parish of Chale, close to the southernmost point of the island (Figure 1). At this time the springs were not developed although tests had shown that a chalybeate spring at Blackgang Chine was stronger than the water of Tunbridge Wells. This situation was to change in the early years of the 19th Century when a local surgeon from Newport, Thomas Laurence Waterworth, set out to locate and investigate the springs. It is likely that his quest was prompted, at least in part, by the war in Europe which since 1793 had closed continental spas to English visitors. After the initial shock, domestic spa life was boosted so that the social lives of the better-off could carry on much as before. This resulted in the promotion of new English spas, at least thirteen of which were founded between 1800 and 1809 (Hembry, 1990). Amongst these was a spring discovered by Waterworth, which he named the Sand Rock Spring after the bed of loose quartzose sand from which it issued. Chemical analysis demonstrated that it had a unique composition and for some years it was marketed as a powerful tonic.

Worsley (1781) also noted a spring, impregnated with alum, which had been discovered at Shanklin (Figure 1) by Dr Fraser, physician to King Charles II. For some time this had been drunk with success, but had become “*gradually disused, and at length neglected*” (Worsley, 1781, p. 6). Alexander Fraiser (Fraiser or Fraser) received a warrant for the position of principal physician to the King in 1664 (Dingwall, 2004). Charles II subsequently visited the Isle of Wight on a number of occasions (Albin, 1795) during any of which his physician

could have sampled water from the spring. However, any fame which the spring enjoyed probably died with the Stuart monarchs and it was to be 200 years before it was to be reborn as the Royal Shanklin Spa.

In this paper the history and hydrogeology of these two contrasting mineral springs on the Isle of Wight is examined. Although both arise from the Cretaceous Lower Greensand Group, and are chalybeate waters, they are geochemically distinct and illustrate the dominant control of rock mineralogy on groundwater composition.

SANDROCK SPRING

The discovery of the Sand Rock (later Sandrock) Spring was announced by Waterworth in a letter published in the November 1811 issue of the *Monthly Magazine* (Waterworth, 1811). This was preceded by a chemical account of the spring published in the first volume of the *Transactions of the Geological Society of London* (Marcet, 1811), which appeared in the latter half of 1811. Of the 18 papers included, it stood out as the only paper not devoted to either mineralogy or to regional geological studies (Davies, 2007). A more detailed account of the discovery, including a letter from Waterworth dated October 1st 1811, together with details of the medical effects of the water and directions for its consumption, are contained in an undated pamphlet by a local army physician, William Lemprière (Lemprière, 1812). A date of 1812 has been assumed for this pamphlet, as it includes correspondence dated as late as November 4th 1811. However, the British Library catalogue assigns an 1811 date. A second edition, also undated,