Horace-Bénédict de Saussure, a Forerunner in 1794 – 95 of Experimental Weathering

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Abstract: In a hitherto unpublished manuscript dated 1794 – 95, H.-B. de Saussure described three types of rudimentary laboratory experiments on weathering, each one lasting about 4 hours, undertaken on samples of jade, serpentine, feldspar, and mica schist. He submitted these samples to dry heating, heating with continuous addition of water, and heating with periodic addition of water. Experimentation was performed at temperatures of the order of 200 – 250 ° C, and Saussure seems to have realized that a reasonable increase of temperature was necessary for laboratory simulation of long-lasting geological processes. No changes were observed during dry heating whereas increasing alteration was noticed in the presence of water, particularly when heating was combined with periodic wetting. He concluded that these tests demonstrated his preconceived idea that weathering of minerals (mostly silicates) resulted from alternating periods of drying and wetting. This concept is basically very close, if not identical, to that underlying modern ideas on seasonal weathering.

Key Words: Experimental weathering • Jadeite • Serpentine • Feldspar • Mica Schist • Goethite • Smectite • Talc • Halloysite • Kaolinite • History of mineralogy

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