

not more than .4090 inch of rain absorbed on the 51 square miles of chalk. The rock is so saturated that it can continue to supply a large yield of water for eighteen months after it has ceased to receive supplies from the surface, or at least has received only very much diminished supplies.<sup>108</sup>

2. **Discharge.**—What proportion of the total rainfall is discharged by rivers is another question of great geological and industrial interest. From the very moment that water takes visible form, as mist, cloud, dew, rain, snow, or hail, it is subject to evaporation. When it reaches the ground, or flows off into brooks, rivers, lakes, or the sea, it undergoes continual diminution from the same cause. Hence in regions where rivers receive no tributaries, they grow smaller in volume as they move onward, till in dry hot climates they even disappear. Apart from temperature, the amount of evaporation is largely regulated by the nature of the surface from which it takes place, one soil or rock differing from another, and all of them probably from a surface of water. Full and detailed observations are still wanting for determining the relation of evaporation to rainfall and river discharge.<sup>109</sup> During severe storms of rain, the

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<sup>108</sup> Lucas, "Horizontal Wells," London, 1874, pp. 40, 41. See also Braithwaite, *Min. Proc. Inst. Civ. Engin.* xx. It is much to be desired that such observations as those of Sir J. B. Lawes, Dr. Gilbert and Sir John Evans on the percolation of rain through soils and chalk (*Min. Proc. Inst. Civ. Engin.* xlv. p. 208; see also Greaves, *op. cit.* p. 19) should be tried in many different areas.

<sup>109</sup> In the present state of our information it seems almost useless to state any of the results already obtained, so widely discrepant and irreconcilable are they. In some cases, the evaporation is given as usually three times the rainfall; and that evaporation always exceeded rainfall was for many years the belief among the French hydraulic engineers. (See *Annales des Ponts-et-Chaussées*, 1850, p. 383.) Observations on a larger scale, and with greater precautions against the undue heating of the evaporator, have since shown, as might have been anticipated, that as a rule, save in exceptionally dry years, evaporation is lower than rainfall. As the average of ten years from 1860 to 1869,