The annual fall of rain is not the same in amount on a plain as on a hill; not the same on the hill-top as on the surface sloping away from it: during any one shower it is not the same on the windward side as on the leeward side of a mountain. Nor is the same quantity of rain collected in a gauge placed at some height above the ground, as in another placed level with the surface of the ground.

On the variation of the quantity of rain according to the height of ground, the only information of value which we can produce from researches in Yorkshire may be obtained by comparing the depths of rain in the elevated and level districts, as given pp. 3–5. From these data it clearly appears that more rain falls in hilly districts,—and we may add, in the immediate vicinity of hilly districts,—than in level tracts. Elevated ground, in fact, causes deflection of the air-currents, and specially forces upward into cooler regions the air which near the surface of the earth is both warmer and more highly charged with moisture. Thus carried up to a higher region in which it is expanded by the diminution of gravity, this damp air is cooled, the moisture which accompanies it cannot all be retained in a vaporous state at the diminished temperature, and some portion is separated and floats about the summits in mist, or falls in rain according to momentary circumstances.

According to Mr. Miller's important experiments in the mountain region which surrounds Sca Fell, it is neither on the summit nor yet at the base of the mountains that the maximum of rain is collected. The greatest quantity seems to be at a height somewhat below 2000 feet. As far as can be at present determined, it is on the leeward side, with reference to the west and south-west winds, that the maximum of rain is to be looked for. In Borrowdale, for example, more rain falls than in Wastdale.

Some experiments, commencing with 1839, at four points in the great Penine ridge, between Glossop and Hathersage, the two extremes being on low ground, and the two middle stations