

which we have thus introduced, indicating groups which, by evidence of all kinds,—of their materials, their position, and their organic contents,—are judged to belong to the same period, implies no small amount of theory: yet this term, from this time forth, is to be looked upon as a term of classification solely, so far as classification can be separately attended to.

Werner's distinctions of strata were for the most part drawn from mineralogical constitution. Doubtless, he could not fail to perceive the great importance of organic fossils. "I was witness," says M. de Humboldt, one of his most philosophical followers, "of the lively satisfaction which he felt when, in 1792, M. de Schlotheim, one of the most distinguished geologists of the school of Freiberg, began to make the relations of fossils to strata the principal object of his studies." But Werner and the disciples of his school, even the most enlightened of them, never employed the characters derived from organic remains with the same boldness and perseverance as those who had from the first considered them as the leading phenomena: thus M. de Humboldt expresses doubts which perhaps many other geologists do not feel when, in 1823, he says, "Are we justified in concluding that all formations are characterized by particular species? that the fossil-shells of the chalk, the muschelkalk, the Jura limestone, and the Alpine limestone, are all different? I think this would be pushing the induction much too far."<sup>12</sup> In Prof. Jamieson's *Geognosy*, which may be taken as a representation of the Wernerian doctrines, organic fossils are in no instance referred to as characters of formations or strata. After the curious and important evidence, contained in organic fossils, which had been brought into view by the labors of Italian, English, and German writers, the promulgation of a system of Descriptive Geology, in which all this evidence was neglected, cannot be considered otherwise than as a retrograde step in science.

Werner maintained the aqueous deposition of all strata above the primitive rocks; even of those *trap* rocks, to which, from their resemblance to lava and other phenomena, Raspe, Arduino, and others, had already assigned a volcanic origin. The fierce and long controversy between the *Vulcanists* and *Neptunists*, which this dogma excited, does not belong to this part of our history; but the discovery of veins of granite penetrating the superincumbent slate, to which the controversy led, was an important event in descriptive geology. Hutton, the

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<sup>12</sup> *Giacciment des Roches*, p. 41