

arise; and doubts may remain, which can be removed only by the application of chemical tests or internal characters, not indeed analyses, but other tests of more easy and speedy application.

Again, many minerals have received their denominations merely from internal properties, such as limestones and marls, &c. The only certain tests of these are chemical agents, though external characters may afford a high degree of probability.

The over-zealous disciples of Mr. Werner contend for the sufficiency of external characters, in all cases, with respect to stones that have been already analyzed. It were an easy, if not an invidious, task to refute them, from the mistakes into which the most eminent of them have fallen, through too great reliance on these characters; but, in justice to Mr. Werner, I must say, that he recommends the aid of easy chemical tests, and has in some cases happily applied them.

It has been objected to external characters, by myself and many others, that they are not of a fixed and permanent nature, nor appropriated purely and singly to any particular species, but common to many, and incapable at least as to their gradations of a definition sufficiently precise. The first part of this objection is certainly true, if applied only to one or two of those characters; but, if they be taken in their totality, it will very rarely happen that they suit any mineral but one, and in such cases chemical tests may decide; yet even this assistance may be sometimes unsuccessful, as in nature many species border upon, and pass into, each other, and thus deny sufficient grounds of distinction. As to the difficulty arising