

ture. We may classify without reference to chemistry ; but if we do so, it is only that we may assert chemical propositions with reference to our classification.

But, as we have already attempted to show, we not only may, but we *must* classify, by other than chemical characters, in order to be able to make our classification the basis of chemical knowledge. In order to assert chemical truths concerning bodies, we must have the bodies known by some tests not chemical. The chemist cannot assert that Arragonite does or does not contain Strontia, except the mineralogist can tell him whether any given specimen is or is not *Arragonitic*. If chemistry be called upon to supply the *definitions* as well as the *doctrines* of mineralogy, the science can only consist of identical propositions.

Yet chemistry has been much employed in mineralogical classifications, and, it is generally believed, with advantage to the science : How is this consistent with what has been said ?

To this the answer is, that when this *has* been done with advantage, the authority of external characters, as well as of chemical constitution, has really been brought into play. We have two sets of properties to compare, chemical and physical ; to exhibit the connexion of these is the object of scientific mineralogy. And though this connexion would be most distinctly asserted, if we could keep the two sets of properties distinct, yet it may be brought into view in a great degree, by classifications in which both are referred to as guides. Since the governing principle of the attempts at classification is the conviction that the chemical constitution and the physical properties have a definite relation to each other, we appear entitled to use both kinds of evidence, in proportion as we can best obtain each ; and then the general consistency and convenience of our system will be the security for its containing substantial knowledge, though this be not presented in a rigorously logical or systematic form.

Such *mixed systems* of classification, resting partly on chemical and partly on physical characters, naturally appeared as the earliest attempts in this way, before the two members of the subject had been clearly separated in men's minds ; and these systems, therefore, we must first give an account of.

Sect. 2.—Mixed Systems of Classification.

Early Systems.—The first attempts at classifying minerals went upon the ground of those differences of general aspect which had been