

CHAPTER VI.

CORRECTION OF THE LAW OF THE SAME ANGLE FOR THE SAME SUBSTANCE.

DISCOVERY OF ISOMORPHISM. **MITSCHERLICH.**—The discovery of which we now have to speak may appear at first sight too large to be included in the history of crystallography, and may seem to belong rather to chemistry. But it is to be recollected that crystallography, from the time of its first assuming importance in the hands of Haüy, founded its claim to notice entirely upon its connexion with chemistry; crystalline forms were properties of *something*; but *what* that something was, and how it might be modified without becoming something else, no crystallographer could venture to decide, without the aid of chemical analysis. Haüy had assumed, as the general result of his researches, that the same chemical elements, combined in the same proportions, would always exhibit the same crystalline form; and reciprocally, that the same form and angles (except in the obvious case of the tessular system, in which the angles are determined by its *being* the tessular system,) implied the same chemical constitution. But this dogma could only be considered as an approximate conjecture; for there were many glaring and unexplained exceptions to it. The explanation of several of these was beautifully described by the discovery that there are various elements which are *isomorphous* to each other; that is, such that one may take the place of another without altering the crystalline form; and thus the chemical composition may be much changed, while the crystallographic character is undisturbed.

This truth had been caught sight of, probably as a guess only, by Fuchs as early as 1815. In speaking of a mineral which had been called Gehlenite, he says, "I hold the oxide of iron, not for an essential component part of this genus, but only as a *vicarious* element, replacing so much lime. We shall find it necessary to consider the results of several analyses of mineral bodies in this point of view, if we wish, on the one hand, to bring them into agreement with the doctrine of chemical proportions, and on the other, to avoid unnecessarily splitting up genera." In a lecture *On the Mutual Influence of*