

The principles of the paper are applied to the determination of the pressure of earth against walls, and the power of earth to sustain buildings. The weight of the building which a horizontal bed of earth will sustain, exceeds the weight of the earth displaced by the foundation, in a ratio which is a function of the angle of repose.

V. "On the Geometrical Isomorphism of Crystals." By HENRY JAMES BROOKE, Esq., F.R.S., Hon. M.C.P.S. &c. Received June 11, 1856.

(Abstract.)

The author commences by remarking that all the crystals at present known have been divided into the six following groups or systems:—the cubic, pyramidal, rhombohedral, prismatic, oblique, anorthic.

He then states that he has constructed tables which accompany this paper of the minerals comprised in each of these systems, except the cubic, in a manner new, as he believes, to crystallography; and that the unexpected facts exhibited by the tables present that science under a new aspect.

The author explains briefly the language and notation he employs in discussing the results of the new tables.

It appears that the crystals in each system, except the cubic, are distinguished from each other by what are termed their elementary angles, that is by angles between particular faces of what may be termed elementary forms.

It is next observed that there is not in crystals any natural character which indicates an elementary or primary form, and it is shown that cleavage which Haüy regarded as such an indication, is only a physical character depending upon the degree of force with which the crystalline particles cohere at the surfaces of particular faces.

The question of high indices is also considered with reference to their influence on the choice of an elementary or primary form, and a general explanation is given of the nature of such indices.

The author then states that the most important of the facts presented by these tables, are the horizontal ranges of nearly equal

angles, as shown in each system, and the general disagreement in the symbols hitherto assigned to the faces which make with some other face those nearly agreeing angles.

With regard to these facts he observes that no difference of opinion can arise, unless the sources from which they have been derived are incorrect; but that differences of opinion may be entertained relative to the interpretation of them.

The interpretation to which the author inclines is, that the near agreement in angle between two corresponding faces is not simply accidental, but that it is the effect of some natural relation not hitherto noticed, among all the crystals in each respective system; and hence, that where the angles between particular faces nearly agree, there ought to be a corresponding agreement in the forms of their symbols.

With this view of the subject in his mind, it occurred to the author that there might be a similar agreement among the whole of the elementary angles in each system, and an examination of the crystals in the pyramidal and rhombohedral systems to ascertain how far this conjecture might be well-founded, has shown that a geometrical isomorphism does exist throughout each of these systems, and that similar relations may therefore be imagined to exist in the other systems.

The author has also suggested that the oblique and anorthic systems are only hemihedral and tetartohedral varieties of prismatic crystals.

VI. "On some Compounds of Ethylene." By H. L. BUFF.
Communicated by A. W. HOFMANN, Ph.D., F.R.S. Received June 10, 1856.

Among the hydrocarbons which are capable of replacing hydrogen, the radicals of the general formula $C_n H_{(n+1)}$, *i. e.* the homologues of ethyl, are best examined. There is another class of hydrocarbons which may be represented by the general formula $C_n H_{(n-1)}$. The only well-known term of this series is the radical allyl, $C_3 H_3$, to which the attention of chemists has been especially called of late by