

Let the reader take a block of ice, say one cubic foot in extent, and place it on a table. Let him cause a beam of heat to play for some time on one side of the block. Let him now shut off the heat and apply a beam of light to the same side in such a manner as to cause an image of the melted parts of the ice to fall on a screen. He will find that all parts of the ice have not been melted equally, but that several portions have been singled out for attack and others left comparatively untouched. He will find that the melted parts, as shown on the screen, bear the shape of beautiful flowers, each with six petals. How comes it that crystals contain forms similar to those we find endowed with vegetable life in the gardens and the fields? Ice is simply water solidified. It is water to which nothing has been added, and from which nothing but heat has been taken away. How comes it to contain flower-forms? The explanation is that, in coming together to form a solid, the particles of water take their places in obedience to fixed laws. Facts such as this are important, for, in considering the problem of the origin of life they will be found to lie at the very root of its solution. Tyndall told us that he observed those things hundreds of times and every time was more and more astounded. The observer may begin at the simple of those crystalline forms and go upward through others more complex. At a certain stage he will encounter characteristics of the vegetable kingdom. The farther he goes above this point the more plentiful will become vegetable characteristics and the more scarce crystalline, until the latter cease altogether, and the observer knows definitely that he is in the region of vegetables. In the same way he can ascend through the vegetable kingdom, passing by easy stages from family to family and from species to species, all closely related. At a certain point he begins to encounter animal characteristics. The farther he goes above this point the more frequently does he meet animal characteristics and the less frequently vegetable, until the latter cease altogether, and he knows that he is in the region of animals. In the same way he can pass through the animal kingdom, from the lowest to the highest, which he will find in his own body. The point to be particularly noted is that between the crystalline kingdom and the vegetable kingdom, and again between the vegetable kingdom and the animal kingdom, there is no dividing line. Tyndall said that the man never lived who could tell where one ends and the other begins. In each case the two kingdoms fit into each other like the cogs of two wheels. We have thus a world of forms showing, from the lowest to the highest, a close and unbroken relation pointing to a common origin, and an evolutionary process. In truth, the life principle is at least co-extensive with the material principle, manifesting itself when the conditions are favourable and disappearing when the conditions are unfavorable.

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Other crystals are even richer in forms resembling those described, but as ice has been mentioned it may as well be adhered to. Every time a drop of water is frozen such forms are produced. When it is remembered that,