In the production of larvæ from the eggs of insects, we see very much the same relation between heat and the vital force as in the case of plants; for the rate of development is in the direct ratio of the heat supplied, and the final transformation may be accelerated or retarded at pleasure, within certain limits, by regulating the amount of heat which they receive; but in every case—in eggs of the same insect—the same amount of heat is required, and must be supplied to effect the same transformation.*

The regularity observed in the period of gestation in warm-blooded animals, is no doubt due in great part to the regularity of temperature that they are capable of sustaining under nearly all circumstances, and which is necessary to the continuance of their vitality, and I would be inclined to think (though I cannot anywhere find it so stated) that the temperature of warm-blooded animals decreases as age comes on, from the single fact (if it be a fact) that the period of gestation is prolonged in accordance with the advance of age.

Besides the influence exercised by light in the decomposition of carbonic acid and ammonia in contact with the green leaves of plants, there is no doubt that it is a force which is extensively used in the process of development, that, in some cases, at least, it determines the manner and direction of growth in a very remarkable degree. A very curious example of this kind is furnished by the experiments of Mirbel upon the gemmæ of *Marchantia polymorpha*. He found after thoroughly testing the matter, by repeated trials, that during the development of these little discs, stomata are formed upon the side exposed to the light, while root fibres grew from the under surface; and it is a matter of indifference which side of the disc is at first turned upwards, since each has the power of developing stomata or roots according to the influence it receives.†

This division of my subject might be almost indefinitely extended, but I have not attempted to do more than notice some of the more salient points belonging to it, which is all my space will admit of.

Higher in the scale of organization there are to be found such facts as the influence of light in the development of tadpoles into frogs;—multitudes of the like instances will present themselves to the mind of every one.

Finally, to test a theory we examine it in all its ramifications, and if it be found to be absolutely opposed to fact in any one case it cannot stand. So if any physical or vital force, however inconsiderable in amount, can be shown to be produced in the ordinary course of nature, as we observe its operations, which do not proceed from some antecedent physical or vital force, such theory can no longer be entitled to belief or consideration. But if, on the other hand, there are vital forces of which we do not know the antecedent force, or that they have any except from analogy, it is the business of the holders of this view to endeavour to clear up, and show the connection between such forces and their correlatives, either in the organic, or in the inorganic world; or to show, if such be the case, that none exist, and so destroy a false hypothesis.

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* Carpenter, Phil. Tran. 1850.

† Carpenter, Phil. Tran. 1850.