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feres to guide the operation of physical causes." We italicize the word, for *interference* proves to be the keynote of Dr. Hodge's system. Interference with a divinely ordained physical Nature for the accomplishment of natural results! An unorthodox friend has just imparted to us, with much misgiving and solicitude lest he should be thought irreverent, his tentative hypothesis, which is, that even the Creator may be conceived to have improved with time and experience! Never before was this theory so plainly and barely put before us. We were obliged to say that, in principle and by implication, it was not wholly original.

But in such matters, which are far too high for us, no one is justly to be held responsible for the conclusions which another may draw from his principles or assumptions. Dr. Hodge's particular view should be gathered from his own statement of it:

"In the external world there is always and everywhere indisputable evidence of the activity of two kinds of force, the one physical, the other mental. The physical belongs to matter, and is due to the properties with which it has been endowed; the other is the everywhere present and ever acting mind of God. To the latter are to be referred all the manifestations of design in Nature, and the ordering of events in Providence. This doctrine does not ignore the efficiency of second causes, it simply asserts that God overrules and controls them. Thus the Psalmist says: 'I am fearfully and wonderfully made. My substance was not hid from Thee when I was made in secret, and curiously wrought (or embosomed) in the lower parts of the earth. . . . God makes the grass to grow, and herbs for the children of men.' He sends rain, frost, and snow. He controls the winds and the waves. He determines the ending of the bee, the flight of an arrow, and the falling of a sparrow" (HODGE, p. 33).

Far be it from us to object to this mode of conceiving divine causation, although, like the two other theistic conceptions referred to, it has its difficulties, and perhaps the difficulties of both. But, if we understand it, it draws an unusually hard and fast line between causation in organic and inorganic Nature, seems to look for no manifestation of design in the

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latter except as "God overrules and controls" second causes, and, finally, refers to this overruling and controlling (rather than to a normal action through endowment) all embryonic development, the growth of vegetables, and the like. He even adds, without break or distinction, the sending of rain, frost, and snow, the flight of an arrow, and the falling of a sparrow. Somehow we must have misconceived the bearing of the statement; but so it stands as one of "the three ways," and the right way, of "accounting for contrivances in Nature;" the other two being—1. Their reference to the blind operation of natural causes; and, 2. That they were foreseen and purposed by God, who endowed matter with forces which he foresaw and intended should produce such results, but never *interferes* to guide their operation.

In animadverting upon this latter view, Dr. Hodge brings forward an argument against evolution, with the examination of which our remarks must close:

"Paley, indeed, says that if the construction of a watch be an undeniable evidence of design, it would be a still more wonderful manifestation of skill if a watch could be made to produce other watches, and, it may be added, not only other watches, but all kinds of time-pieces, in endless variety. So it has been asked, If a man can make a telescope, why cannot God make a telescope which produces others like itself? This is simply asking whether matter can be made to do the work of mind. The idea involves a contradiction. For a telescope to make a telescope supposes it to select copper and zinc in due proportions, and fuse them into brass; to fashion that brass into inter-entering tubes; to collect and combine the requisite materials for the different kinds of glass needed; to melt them, grind, fashion, and polish them, adjust their densities, focal distances, etc., etc. A man who can believe that brass can do all this might as well believe in God" (pp. 45, 46).

If Dr. Hodge's meaning is, that matter unconstructed cannot do the work of mind, he misses the point altogether; for original construction by an intelligent mind is given in the premises. If he means that the machine cannot originate the

power that operates it, this is conceded by all except believers in perpetual motion, and it equally misses the point; for the operating power is given in the case of the watch, and implied in that of the reproductive telescope. But if he means that matter cannot be made to do the work of mind in constructions, machines, or organisms, he is surely wrong. "*Sovitur ambulando, vel scribendo*," he confuted his argument in the act of writing the sentence. That is just what machines and organisms are for; and a consistent Christian theist should maintain that is what all matter is for. Finally, if, as we freely suppose, he means none of these, he must mean (unless we are much mistaken) that organisms originated by the Almighty Creator could not be endowed with the power of producing similar organisms, or slightly dissimilar organisms, without successive interventions. Then he begs the very question in dispute, and that, too, in the face of the primal command, "Be fruitful and multiply," and its consequences in every natural birth. If the actual facts could be ignored, how nicely the parallel would run! "The idea involves a contradiction." For an animal to make an animal, or a plant to make a plant, supposes it to select carbon, hydrogen, oxygen, and nitrogen, to combine these into cellulose and protoplasm, to join with these some phosphorus, lime, etc., to build them into structures and usefully-adjusted organs. A man who can believe that plants and animals can do this (not, indeed, in the crude way suggested, but in the appointed way) "might as well believe in God." Yes, verily, and so he probably will, in spite of all that atheistical philosophers have to offer, if not harassed and confused by such arguments and statements as these.

There is a long line of gradually-increasing divergence from the ultra-orthodox view of Dr. Hodge through those of such men as Sir William Thomson, Herschel, Argyll, Owen, Mivart, Wallace, and Darwin, down to those of Strauss, Vogt,

and Büchner.<sup>1</sup> To strike the line with telling power and good effect, it is necessary to aim at the right place. Excellent as the present volume is in motive and clearly as it shows that Darwinism may bear an atheistic as well as a theistic interpretation, we fear that it will not contribute much to the reconciliation of science and religion.

The length of the analysis of the first book on our list precludes the notices which we intended to take of the three others. They are all the production of men who are both scientific and religious, one of them a celebrated divine and writer unusually versed in natural history. They all look upon theories of evolution either as in the way of being established or as not unlikely to prevail, and they confidently expect to lose thereby no solid ground for theism or religion. Mr. St. Clair,<sup>2</sup> a new writer, in his "Darwinism and Design; or, Creation by Evolution," takes his ground in the following succinct statement of his preface:

"It is being assumed by our scientific guides that the design-argument has been driven out of the field by the doctrine of evolution. It seems to be thought by our theological teachers that the best defense of the faith is to deny evolution *in toto*, and denounce it as anti-Biblical. My volume endeavors to show that, if evolution be true, all is not lost; but, on the contrary, something is gained: the design-argument remains unshaken, and the wisdom and beneficence of God receive new illustration."

Of his closing remark, that, so far as he knows, the subject has never before been handled in the same way for the same purpose, we will only say that the handling strikes us as

<sup>1</sup> David Friedrich Strauss (1808-1874), German commentator on the Bible. Karl Vogt (1817-1895), German biologist who had to spend most of his career in Switzerland because of his political activity during the Revolution of 1848. Friedrich Karl Christian Ludwig Büchner (1824-1899), German writer on materialism, author of *Kraft und Stoff*.

It was only by such occasional comments as this that Gray indicated his awareness of the divergence of German thought from that of the Anglo-American world on the subject of Darwinism.

<sup>2</sup> George St. Clair, author of *Buried Cities and Bible Countries* as well as *Darwinism and Design*.

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mainly sensible rather than as substantially novel. He traverses the whole ground of evolution, from that of the solar system to "the origin of moral species." He is clearly a theistic Darwinian without misgiving, and the arguments for that hypothesis and for its religious aspects obtain from him their most favorable presentation, while he combats the *dysteleology* of Hackel, Buchner, etc., not, however, with any remarkable strength.

Dr. Winchell,<sup>3</sup> chancellor of the new university at Syracuse, in his volume just issued upon the "Doctrine of Evolution," adopts it in the abstract as "clearly as the law of universal intelligence under which complex results are brought into existence" (whatever that may mean), accepts it practically for the inorganic world as a geologist should, hesitates as to the organic world, and sums up the arguments for the origin of species by diversification unfavorably for the Darwinians, regarding it mainly from the geological side. As some of our zoologists and paleontologists may have somewhat to say upon this matter, we leave it for their consideration. We are tempted to develop a point which Dr. Winchell incidentally refers to—viz., how very modern the idea of the independent creation and fixity of species is, and how well the old divines got on without it. Dr. Winchell reminds us that St. Augustine and St. Thomas Aquinas were model evolutionists; and, where authority is deferred to, this should count for something.

Mr. Kingsley's<sup>4</sup> eloquent and suggestive "Westminster Sermons," in which he touches here and there upon many of the topics which evolution brings up, has incorporated into the preface a paper which he read in 1871 to a meeting of

<sup>3</sup>Alexander Winchell (1824-1891), American clergyman and evolutionary naturalist who was the principal in a celebrated if misunderstood academic freedom case at Vanderbilt.

<sup>4</sup>Charles Kingsley (1819-1875), famous British clergyman and author of *The Water Babies*. He had spoken highly of Gray's *Atlantic articles* (chapter III) in 1860 and subsequently visited Gray in the United States.

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London clergy at Sion College, upon certain problems of natural theology as affected by modern theories in science. We may hereafter have occasion to refer to this volume. Meanwhile, perhaps we may usefully conclude this article with two or three short extracts from it:

"The God who satisfies our conscience ought more or less to satisfy our reason also. To teach that was Butler's mission; and he fulfilled it well. But it is a mission which has to be refilled again and again, as human thought changes, and human science develops. For if, in any age or country, the God who seems to be revealed by Nature seems also different from the God who is revealed by the then-popular religion, then that God and the religion which tells of that God will gradually cease to be believed in.

"For the demands of reason—as none knew better than good Bishop Butler—must be and ought to be satisfied. And, therefore, when a popular war arises between the reason of any generation and its theology, then it behooves the ministers of religion to inquire, with all humility and godly fear, on whose side lies the fault; whether the theology which they expound is all that it should be, or whether the reason of those who impugn it is all that it should be."

Pronouncing it to be the duty of the naturalist to find out the how of things, and of the natural theologian to find out the why, Mr. Kingsley continues:

"But if it be said, 'After all, there is no why; the doctrine of evolution, by doing away with the theory of creation, does away with that of final causes,' let us answer boldly, 'Not in the least.' We might accept all that Mr. Darwin, all that Prof. Huxley, all that other most able men have so learnedly and acutely written on physical science, and yet preserve our natural theology on the same basis as that on which Butler and Paley left it. That we should have to develop it I do not deny.

"Let us rather look with calmness, and even with hope and good-will, on these new theories; they surely mark a tendency toward a more, not a less, Scriptural view of Nature.

"Of old it was said by Him, without whom nothing is made, 'My Father worketh hitherto, and I work.' Shall we quarrel with Science if she should show how these words are true? What, in one word, should we have to say but this: 'We know of old that God was so wise that he could make all things; but, behold, he is so much wiser than even that, that he can make all things make themselves?'"