

# THE PRINCETON THEOLOGICAL REVIEW

VOLUME VI

OCTOBER 1908

NUMBER 4

HERMAN BAVINCK.

The Free Churches of Holland possess at the present moment in Dr. Abraham Kuyper and Dr. Herman Bavinck theologians of genius and of erudition worthy of the best traditions of the Reformed theology. In the autumn of 1898 Dr. Kuyper delivered at Princeton Seminary the L. P. Stone Lectures, and thus for the first time made his voice heard by an English-speaking audience. During the present month Dr. Bavinck is to deliver these Lectures. The circumstance seems worthy of notice; and the occasion seems to call for some introduction of Professor Bavinck to his American audience. The following account of the position he occupies and the work he has done in the churches and for the people of the Netherlands has been derived from an authentic source.—EDITORS.

The Reformed Church in the Netherlands underwent a great change in the first quarter of the nineteenth century. Rationalism had already penetrated into the church and caused a tremendous upheaval; but it now made itself master of almost the whole of the church in the form of a moderate supranaturalism. Everywhere the old truths of atonement and regeneration were set aside in favor of new dogmas of the example of Jesus and of moral improvement. The hope was cherished that an end could be put to the old faith by means of official preaching, elementary education

worthy of careful consideration. There are many subtle and hardly detected factors that, unconsciously to the witness, affect his best attempts to tell the truth. It is psychologically scientific to declare that children, fools and tipsy people are most likely to out with the plain truth. Taking an oath may itself have the effect of an inhibition upon truth-telling. If only one man in every thirty or forty can distinguish at a distance between a red and a green lantern, it is little wonder that the sworn testimony of honest men differs so widely. If it be true that there is nothing in the material itself which enables the knower to know whether he came upon it by perceiving it as a fact or by recalling it as a memory or by imagining it as a fancy, then to the man who imagines very vividly it may be a pretty mixed question sometimes whether he gets his facts from the field of reality, from the range of past experience or from the airy realms of fancy.

The functions of the hypnotist are represented as being very important in the practical administration of criminal jurisprudence. The Harvard professor impresses the lay mind as being too cock-sure. We are soon led to allow for the personal equation in our author. We are hardly able to accept the psychological judgment of Professor Münsterberg in Cambridge against the formal verdict of a court and jury in Chicago as to the guilt or innocence of a murderer in Chicago. We would be surer of the new psychology if the new psychology were not quite so sure of itself. The agnostic must not be too certain that nobody can be certain of anything; neither must the psychologist forget that the furtive and fugitive factors of the personal equation enter into his own judgment upon the thoughts of other men. This book should be exceedingly suggestive to the preacher of the Gospel. If some Münsterberg in the ministry should write such a book, applying the results of the new psychology not only to the dogmas and dogmatists of scholastic theology, but also to the preaching and hearing of the pulpit-message, it might bring out, among other things of doubtful value, some helpful lessons for both the pulpit and the pew. Some one has said that theology is nine-tenths temperament, and there is an element of truth in the remark; but it is nearer the truth to say that in the close and vital touch of the preacher with his hearers, his work is in very large measure psychologically conditioned. For suggestive light reading, we commend this by-product of the new psychology to any who are interested in the great work of imparting impressions and conveying truth to others.

*Trenton.*

HENRY COLLIN MINTON.

## APOLOGETICAL THEOLOGY.

DARWINISM TO-DAY. A discussion of present-day scientific criticism of the Darwinian Selection Theories, together with a brief account of the principal and other proposed auxiliary and alternative Theories

of Species-forming. By VERNON L. KELLOGG, Professor in Leland Stanford, Jr., University. New York: Henry Holt & Co. 1907. 8vo.; pp. xii, 403. With good analytical Table of Contents and an (insufficient) Index.

A book like this has long been greatly needed: and this ever increasing need is admirably met by this volume. Of course, Professor Kellogg writes from his own point of view, and he would not be human if he did not leave some things to be desired. Readers of his book should supplement it by reading also some such book as Rudolph Otto's *Naturalism and Religion*; as readers of Otto's book should certainly supplement it by reading Professor Kellogg's. If what Otto has to say, for example, upon teleology, and the relation of teleology to mechanical explanations of phenomena, will help the reader to correct Professor Kellogg's unreasonable objection to all that he calls "mystical" in our world-view, Professor Kellogg will on the other hand give him a far richer knowledge of, if not a deeper insight into, the great debate which has been going on of late upon the factors and processes of the development of organized forms. No one can have been unaware of this debate or of the gradual modifications it has been working in the attitude of the scientific world to the traditional Darwinian conceptions. But the general reader has lacked adequate guidance to an exact estimate of the drift of the discussion, and has been liable to be left in a state of mental confusion or to be unduly swayed by the latest advocate of a special line of theory he may have chanced to read. A comprehensive survey of the whole field of the debate from the hand of a competent guide is what he has needed. And this is what Professor Kellogg has given us in this volume.

Professor Kellogg wisely begins at the beginning—with a lucid account of what Evolution means, in general, and what that particular theory of Evolution known as Darwinism really is. And he rightly finds the differentiation of Darwinism, specifically so called, in the Selection Theories,—or, let us say, that we may keep our eyes fixed on the real pivot of it all, in the theory of Natural Selection. Keeping this central point well in sight, he next gives his readers a careful and clear account, in no way glozing its extent or its seriousness, of the widespread revolt of biological investigators during the last few decades against the principle of Natural Selection,—against ascribing to it the whole work of species-forming, and even at times against ascribing to it any effectiveness or capacity for species-forming. Having thus exhibited the attack on Darwinism in its full reach and force, he next, with equal care and fulness, recounts the defense which has been made of it—a defense sometimes very strong, but always involving certain concessions which go to modify or even to transform the rôle which is ascribed to Natural Selection in the moulding of forms. This leads naturally to a survey of the new theories of species-forming which have been suggested, whether as auxiliary to the theory of Natural Selection, designed to supply its deficiencies, or as alternative to it, designed to

supplant it. This survey has not been carried through without betraying Professor Kellogg's own predilections; the volume naturally closes, therefore, with a chapter on Darwinism's Present Standing, in which the results of the debate are summed up and Professor Kellogg's own conclusions outlined. These conclusions may be briefly stated in these two sentences: "Darwinism, as the all-sufficient, or even most important causo-mechanical factor in species-forming, and hence as the sufficient explanation of descent, is discredited and cast down." "Darwinism, as the natural selection of the fit, the final arbiter in descent control, stands unscathed, clear and high above the obscuring cloud of battle." That is to say, Professor Kellogg recognizes in Natural Selection a true cause, actually working in nature, to the control of which the stream of descent is subjected, so that when we look at the whole course of development, we see it moving on under its guidance. But he recognizes also that Natural Selection rather works on the stream of descent than produces it, and accounts rather for the general channel in which it flows, than for itself, whether in its main character or many of its minor characteristics. He evidently conceives himself as standing midway between the contending extremes, allowing to Natural Selection a most important function in species-forming, but denying to it the omnipotence which the Neo-Darwinians are prone to ascribe to it.

The place of Darwin in the history of the evolutionary theories is determined by the fact that he first pointed to a *vera causa*, actually working in the world, to which could be plausibly ascribed the production of the various forms which occur in the animated universe. The essence of his suggestion consisted in the very simple proposition that if multitudes more beings are born into the world than can possibly live in it, it will be inevitable that those which are least fitted to live in it will be crowded out, which will result naturally in the survival of the fittest in each generation. Thus there will come about the gradual moulding of organized beings to fit their environment. The strength of the theory lies in its simplicity, and its apparent appeal to nothing but recognized facts. We all know that over-production is the law of life. We all know that no two individuals are precisely alike. We are all prepared to allow that in the struggle for existence which seems inevitable in these circumstances it will be the fittest among these unlike individuals which survive. We are equally prepared to admit that, as "like begets like", the fittest will reproduce in their offspring their fitnesses. Who, then, can deny that in the course of innumerable generations going on thus, very considerable modifications from the original stock might be produced? Is there not given here, then, an adequate account of the whole course of development of animate forms?

Certainly the theory looks very simple and convincing. But so soon as we transfer it from the region of imaginary construction to that of fact, difficulties arise. Many of the objections which have been urged against it seem to us, to be sure, to be little justified. These are largely directed against its consistency or completeness as a logical construc-

tion. From this point of view, however, as it seems to us, the theory is unassailable. When, for example, it is objected—as it has been persistently objected—that it provides only for the survival of the fittest, not for the production of the fittest; that it leaves unexplained the whole matter of the cause of variation and particularly of the causes of the actual variations which occur; that it has no account to give of the opportune appearance of the variations needed, or of the repeated consecution of variations in the same direction in the line of actual descent—and the like: the mark seems to us to be completely missed. The Darwinian theory does not need to concern itself with the origin of the fittest, the cause of variation, the causes of the specific variations which occur, or their opportuneness or consecution. It is logically complete in the simple postulates of variation, struggle for existence, the survival of the fittest. If we admit, as all must admit, that no two individuals are ever exactly alike, then we must admit that some of these individuals are more fit to exist than others; that is given in the very fact of difference. We need not concern ourselves with how the “fitness” arises; relative fitness is inherent in the mere fact of difference. Neither need we concern ourselves with the objection that relative fitness in some particulars in a given individual may be offset by relative unfitness in other particulars. To estimate in these circumstances which organism is on the whole most fit to survive might puzzle us: it cannot puzzle Nature, which acts simply along the line of the resultant. Wherever two individuals exist it is inevitable that one will be “fitter” than the other: wherever thousands or millions of individuals, generically alike, come into being, there necessarily exist among them some, few or many, who will be “fitter” than the rest. And if these thousands or millions of individuals come into being in such circumstances that the great majority of them must needs be crowded out, the survival of the “fittest” seems certain; and as this process goes on through generation after generation, the line of descent must follow the line of relative fitness.

Logically unassailable as the theory is, however, so soon as we presume that this process has actually gone on, we find ourselves faced with many difficulties. The difficulties are important—or let us frankly say, as it seems to us, are destructive of the theory. But they do not lie against the logical completeness (and therefore the plausibility) of the theory, but rather against its actual working power. It may be suspected that it is often an underlying sense of these factual difficulties, subtly modifying the objector's point of view as to the conditions of the problem to be solved, which accounts for the pressing of the (really ineffective) logical difficulties. These real difficulties raise such questions as these. What reason is there to believe that the struggle for existence in animate nature is severe enough rigorously to eliminate in each generation all but the fittest to survive? What reason is there to suppose that the differences by which (as we all must agree) individuals are discriminated from one another, are great enough to form telling factors in the struggle for existence, even supposing it to exist

in the rigor which the theory postulates? What reason is there to suppose, even if the variations are great enough to furnish a handle for selection and the struggle for existence is severe enough to weed out all but the fittest in each generation, that this process, continued from generation to generation, will result in any great modification of type, and the successive generations will not rather fluctuate around a center, as variation itself fluctuates around this center, and thus on the whole the type remain stationary? Or if there is marked on the whole an increasing divergence from the original type as the line of descent advances through the fittest of each generation—a general divergence on the whole amid much fluctuation (which seems the most that, on the theory, can be possibly postulated)—what reason is there to suppose that this divergence could advance very far in the time at disposal? And above all, what reason is there to suppose that this slowly increasing divergence produced by the survival in each generation of only the “fittest”—through the many fluctuations to this side and that which, on the hypothesis, must occur—could in the time at disposal produce the infinite variety of animate forms which has actually come into being? Or, to put the question in its sharpest form, could not only bridge the gulf which separates the amoeba from man, but bridge it by a steady upward advance—upward, that is, not merely in the sense of ever more and more perfect adjustment to the environment, nor even in the sense of progress “from homogeneity to heterogeneity”, to ever greater complexity of structure, but measured by an absolute standard of value? For this is what has really happened, if the palaeontological record has anything at all to tell us; and it has happened, if any trust at all can be placed in the calculations of the physicists, with a rapidity which confounds thought. The formal completeness of the logical theory of Darwinism is fairly matched, therefore, by its almost ludicrous actual incompetence for the work asked of it.

Of course, this has become ever more and more apparent as time has passed, and workers in the relevant fields of research have escaped somewhat from the obsession of the specious plausibility of the Selection Theory and looked more squarely in the face of the problems to be solved. Here and there, no doubt, as was inevitable, there has been a disposition exhibited to gloze its inefficiency, and to “cure” its defects by ineffective remedies. A recent instance of this is noted by Prof. Kellogg, when he records (p. 55) Prof. Ray Lankester’s appeal to the properties of radium as offsetting the physicists’ calculations as to the time available for the possible existence of life on the earth. If, Prof. Lankester argues, the sun contained a fraction of one per cent. of radium, that would offset its estimated loss of heat and, “upsetting all the calculations of the physicists”, give us the thousands of millions of years which are needed (on the Darwinian hypothesis) “to allow time for the evolution of living things”. When men catch at straws like this to buttress their theories with, it becomes clear what a strawy foundation they are building on. Nor would the concession of the

thousands of millions of years needed (but not obtained) relieve the difficulties of the case, which have led biologist after biologist to suggest supplementary theories designed to meet the failure of the main theory in this or that aspect of it, or, in ever increasing numbers as time has gone on, to propose alternative theories, and in extreme instances to assume an attitude of opposition to the doctrine of descent altogether. Thus De Vries' theory of "mutations" may be supposed to be ultimately due to the feeling that "natural selection" must have marked variations to work on; Eimer's theory of "orthogenesis" to the feeling that some account must be given of the advance of development along a straight line; Nägeli's theory of a "principle of perfection" in organisms to the recognition of the steady advance of the line of evolution towards something that looks very much like a goal.

The result of it all is that Darwinism, specifically so called,—that is, as a particular theory accounting for the differentiation of organic forms,—stands to-day not merely as Prof. Kellogg somewhat too gently puts it (p. 5), "seriously discredited in the biological world", but practically out of the running. Even the most extreme Neo-Darwinians (like Weismann) have been compelled to supplement it by auxiliary theories which altogether change its complexion. It is quite true also, on the other hand, however, that nothing has come to take its place; as Prof. Kellogg truly puts it (p. 375): "these bitter antagonists of selection are especially unconvincing when they come to offer a replacing theory, an alternative explanation of transformation and descent". The real state of the case seems to be that the deficiencies of the Darwinian hypothesis have come to be widely recognized and numerous suggestions have been made, which severally provide for, or seek to provide for, this or the other of these deficiencies. But no one of these will serve any better than Darwinism itself serves—possibly not even so well as Darwinism serves—as a complete "causomechanical" explanation of the differentiation of organic forms. Each severally—all in combination (so far as they can be combined)—still leave something, and something essential, to be desired. The problem still presses on us; a great variety of suggestions are being made to solve it; it remains as yet unsolved.

What most impresses the layman as he surveys the whole body of these evolutionary theories in the mass, is their highly speculative character. If what is called "science" means careful observation and collection of facts and strict induction from them of the principles governing them, none of these theories have much obvious claim to be "scientific". They are speculative hypotheses set forth as possible or conceivable explanations of the facts. This is fully recognized by Prof. Kellogg. "What may for the moment detain us, however", he says (p. 18, cf. p. 382), "is a reference to the curiously nearly completely subjective character of the evidence for both the theory of descent and natural selection. . . . Speaking by and large we only tell the general truth when we declare that no indubitable cases of species-forming by transforming, that is, of descent, have been observed; and that no rec

ognized case of natural selection really selecting has been observed. . . . The evidence for descent is of satisfying but purely logical character; the descent hypothesis explains completely all the phenomena of homology, of palaeontological succession, of ontogeny, and of geographical distribution; that is, it explains all the observed facts touching the appearance in time and place on this earth of organisms and the facts of their likenesses and unlikenesses to each other. . . . The evidence for the selection theory . . . also chiefly rests on the logical conclusion that under the observed fact of over-production, struggle is bound to occur; that under the observed fact of miscellaneous variation, those individuals most fortunate in their variations will win in the struggle; and finally, that under the observed fact of heredity, the winners will transmit to their posterity their advantageous variations, all of which inter-acting facts and logically derived processes will be repeated over and over again, with the result of slow but constant modification of types, that is, formation of new species" (cf. p. 92, 394). What is thus true of the theory of descent in general and the specific theory of selection put forward to account for this descent, is equally—often far more—true of the auxiliary and substitutionary theories which have been suggested to fill out the deficiencies of the latter or to supplant it (cf. pp. 382, 391). These are often hyper-speculative theories, which have only this to recommend them to our consideration,—that *if* they be conceived to represent fact they may supply an explanation of the facts of observation. Thus far, there is no other reason than this for supposing them to represent fact. And it is obvious that a vivid imagination may supply many competing theories of this hypothetical sort and all of them prove subsequently to have no basis whatever in reality. The lay reader may be excused if, reading over the outlines of these several theories, he is oppressed with a sense of their speculative character; in a word, of their unreality. For ourselves we confess frankly that the whole body of evolutionary constructions prevalent to-day impresses us simply as a vast mass of speculation, which may or may not prove to have a kernel of truth in it. All that seems to us to be able to lay claim to be assured knowledge in the whole mass is that the facts of homology and of the palaeontological record suggest that the relation of animate forms to one another may be a genetic one. So soon as we come to attempt to work out for ourselves a theory of the factors and process of the differentiation of these forms, we are in the region of pure speculation and can claim for our constructions nothing more than that the facts leave them tenable. Whether they ought to be held as well as are capable of being held, we seem to lack all direct evidence.

The next thing that most strongly impresses the lay reader is the amazing zeal which is exhibited by our biological workers for these speculative theories. It is not merely that every man has his theory and sets great store by it, however speculative it may be. It almost seems at times that facts cannot be accepted unless a "causo-mechanical" theory be ready to account for them: which looks amazingly like

basing facts on theory rather than theory on facts. Professor Kellogg himself is no stranger to this state of mind. He is at least repeatedly telling us of this or the other contention that it is unacceptable because no "causo-mechanical" theory explaining its operation is forthcoming. It almost seems at times as if it were "causo-mechanical" theories rather than facts that our biological investigators are on the lookout for. And let us note well, that it is a "causo-mechanical" theory alone that satisfies them. There must be no "mysticism" involved; we had almost said no "mysteries". They seem to say to us that nature is as plain as a book and has no secrets which are intrinsically secrets, but only secrets in the sense that they are not yet found out. But above all, they not only seem to say—but, if we are to take Prof. Kellogg for an example, do say—that there must be no loophole left in our explanations for the intrusion of even directive forces from without. It is enough for Prof. Kellogg to condemn a theory out of hand, if it involves the recognition—or the suspicion—of the working in animate nature of forces deeper—or higher—than physico-chemical ones. Accordingly the Neo-Vitalism which is playing its part in the biological circles of Germany is set aside with a bare word. "Bütschli has well pointed out", we read, "that Neo-Vitalism is really only a return to the old 'vital principle' belief, and that we are now, and have been ever since our practical giving up of the vital principle notion, making steady progress in the explanation of life-forms and life-functions on strictly mechanical and physico-chemical grounds" (pp. 226-7). Even when it is introduced "under a pseudo-scientific guise", therefore—as, no doubt, for instance by Driesch, who in positing "an extra-physico-chemical factor" (which he calls "psychoid"), yet is careful to represent it as "an attribute of, or essential kind of potentiality pertaining to, organized living substance"—the assumption of the interworking into the phenomena of organic life of anything above "psycho-chemical" forces is treated as out of the question. The whole animate universe is to be explained on the basis of these forces alone, and no theory of it is even to be taken into serious consideration which is not ready with a causo-mechanical explanation on these grounds. Here is a chance sentence, for example, which seems to indicate in a word the settled point of view of Professor Kellogg himself certainly and apparently of those whom he naturally represents: "Nägeli's automatic perfecting principle is an impossibility to the thorough-going evolutionist seeking for a causo-mechanical explanation of change" (p. 387).

This amounts, it will be seen, to a definitely polemic attitude—of a rather extreme kind—towards teleology. It is true that teleological language is sometimes employed. In the immediate context of the sentence just quoted, Professor Kellogg speaks of the occurrence of "determinate or purposive change". But this is only an instance of that "personifying language" which is the bane of naturalistic writers. What he means is that "the simple physical or mechanical impossibility of perfect identity between process and environment in the case of one individual and process and environment in the case of any other" will

automatically produce such a variety in individuals as will result in "the change needed as the indispensable basis for the upbuilding of the great fabric of species diversity and descent". That is to say, he is here only saying that the simple fact of unlikeness between individuals—so that no two individuals are precisely alike—provides materials for selection to work on and precludes the necessity—on Darwinian ground—of inquiring into the causes of variation or seeking out a principle of orthogenesis. There will always be "a fittest" at hand. We have already pointed out the sense and limits in which this contention is valid. What is here interesting us is that this is all that Dr. Kellogg means by "determinate or purposive change". His polemic attitude towards all real teleology in the evolutionary process—to the intrusion into it of the guidance of purpose, properly and not abusively so called—we will not say is betrayed, it is expressed, over and over again in this volume. In criticizing the type of theory represented by Nägeli and Korschinsky which assumes "a special tendency towards progress" in the organism—"an inner directive force", an "inner law of development"—for instance, Professor Kellogg writes (p. 278): "It is needless to say that but few biologists confess to such a belief. However much in the dark we may be regarding the whole great secret of bionomics, however partial and fragmentary our knowledge of the processes and mechanism of evolution, such an assumption of a mystic, essentially teleological force wholly independent of and dominating all the physico-chemical forces and influences that we do know and the reactions and behaviour of living matter to these influences which we are beginning to recognize and understand with some clearness and fulness—such a surrender of all our hardly won actual scientific knowledge in favour of an unknown, unproved, mystic vital force we are not prepared to make. As Plate well says, such a theory of orthogenesis is opposed, in sharpest contrast, to the very spirit of science." Again (p. 376): "Modification and development may have been proved to occur along determinate lines without the aid of natural selection. I believe they have. But such development cannot have an aim; it cannot be assumed to be directed towards advance; there is no independent progress upward, *i. e.*, towards higher specialization. At least, there is no scientific proof of any such capacity in organisms. Natural selection remains the one causo-mechanical explanation of the large and general progress towards fitness; the movement towards specialization; that is, descent as we know it." Still again, criticizing von Kölliker (p. 350): "He included in his general theory of heterogenesis, a basic plan of progressive evolution. Such a conception has in it too much ontogenic orthogenesis; it is too redolent of teleology for present-day biology." Teleology itself is seen then to be the *bête noire* of biology as represented by Professor Kellogg. "Certainly", we are told (p. 375), "no present-day biologist is ready to fall back on the long deserted standpoint of teleology and ascribe to heterogenesis or orthogenesis an auto-determination towards adaptiveness and fitness." "Definitely directed variation" he may with Weismann allow to exist (p. 199); "but not

predestined variation running on independently of the life conditions of the organism as Nägeli . . . has assumed" (cf. 381). As he expresses it with the polemic edge well turned out, in another place (p. 377): "Nor can any Nägelian automatic perfecting principle hold our suffrage for a moment unless we stand with the theologists on the insecure basis of teleology." That is to say, the ultimate objection to Nägeli's "principle of perfection" is—just that it is too much like teleology—the "teleology of the theologists". In other words, the scandalon is precisely teleology, in any form.

Now all this is very depressing. The anti-teleological zeal of Mr. Darwin is well known: the vigor with which—as, for instance, in his correspondence with Asa Grey—he repelled the intrusion of teleology into his system betrays his fundamental thought. The anti-teleological implication of Darwinism, taken in its strictness—when it becomes a system of pure accidentalism—is obvious. But it could have been hoped that we had got by now well beyond all that. Some lack of general philosophical acumen must be suspected when it is not fully understood that teleology is in no way inconsistent with—is rather necessarily involved in—a complete system of natural causation. Every teleological system implies a complete "causo-mechanical" explanation as its instrument. Why, then, should the investigators of the "causo-mechanical" explanation array themselves in polemic opposition to the very conception of governing purpose? Above all, why should they make the test of the acceptability of theories, the recognition or non-recognition by them of teleological factors? This gives the disagreeable appearance to the trend of biological speculation—we do not say of biological investigation—that it is less interested in science for science's sake, that is, in the increase of knowledge, than it is in the validation of a naturalistic world-view: that it is dominated, in a word, by philosophical conceptions, not derived from science but imposed on science from without. Of course, there are many workers in the biological, as in other scientific fields, to which this will not apply. And it may well be contended that the drift of thought among investigators in these fields is precisely towards the recognition of the mystery of life and life-processes, of their inexplicability on purely physico-chemical grounds, of the necessity of the assumption of the working of some higher directive force in the advance of organic development—in a word, towards just that vitalism and teleology which Professor Kellogg scouts, not as excluded by observed fact or by proved theory, but as inconsistent with "the scientific spirit"—which seems as much as to say with an *a priori* philosophical attitude. In the meanwhile, however, it seems clear that much of our scientific thought is still under the control of a very definite anti-teleological (which is as much as to say an a-theistic, for teleology and theism are equipollent terms) prejudice.

We should be sorry to close even so desultory a notice of a book so competent and so informing on a note of blame. After all, the book is not an anti-teleological treatise; and though its allusions to the hypothesis of teleology in organic nature are disturbing, they are only

allusions. What the book undertakes to do is to "present simply and concisely the present-day standing of Darwinism in biological science", and to outline the various auxiliary and alternative theories of species-forming which have been proposed to aid or to replace the selection theories". And this it does well, with thorough knowledge, with sufficient fulness, and with adequate exactness. Professor Kellogg exhibits here great skill in expounding and much penetration in criticizing the several views which have been advanced, and commends his own views to us by their moderation and balance. He impresses us as a safe guide to the history both of evolutionary speculation and of biological research. Readers desiring to know the present state, whether of knowledge or of opinion, in this sphere of research, cannot do better than to resort to his comprehensive and readable volume.

*Princeton.*

B. B. WARFIELD.

NO STRUGGLE FOR EXISTENCE: NO NATURAL SELECTION. A Critical Examination of the Fundamental Principles of the Darwinian Theory. By GEORGE PAULIN. Edinburgh: T. & T. Clark. 1908. New York: Imported by Charles Scribner's Sons. 8vo.; pp. xx, 261. Price, \$1.75 net.

We have not had the fortune to meet with other writings by Mr. George Paulin and are entirely ignorant of his personality. He speaks of himself as of one advanced in years; and his manner of writing seems to accord with this description, characterized as it is at once by a certain ripeness of tone and by a certain diffuseness of expression. The matter of his book is highly speculative in character and divides itself into two extended arguments—the one in refutation of the Darwinian theory of Natural Selection, the other in rebuttal of the central contention of Malthus' Essay on Population. Unity is secured by the identity of the governing principle in the two theories which are examined.

Mr. Paulin appears to ascribe a venturesome novelty to his assault on the core of the Darwinian hypothesis which somewhat astonishes us. He seems almost to imagine that he is the first, or among the first, to arraign the conceptions of the "struggle for existence" and "survival of the fittest". Readers who are unaware of the widespread revolt from these conceptions among recent scientific investigators should at least read the three chapters on "Darwinism Attacked" in Professor Vernon L. Kellogg's *Darwinism To-day*. Meanwhile, Mr. Paulin's apparent lack of acquaintance with these labors of his fellow-workers gives to his strictures on the Darwinian hypothesis the value of an independent criticism. The hundred and twelve pages which he devotes to this criticism, diffuse and speculative as they are, and now and then somewhat heated, are nevertheless quite effective,—chiefly because they lay stress on certain broad considerations, which, apart from all details, appear to be fatal to the Darwinian construction.

Neither the palaeontological record nor the present state of the