

ARTICLE X.—COOK'S LECTURES ON BIOLOGY.

Boston Monday Lectures, Biology, with Preludes on Current Events.

By JOSEPH COOK. Boston: Osgood & Co. 1877. 325 pp.

THE saying of Andrew Fairservice, that "there are many things ower bad for blessing and ower gude for banning," applies to this volume. The merits of these lectures are in a degree peculiar; their faults are still more so. If the latter appear to engross our attention it is because of their remarkable prominence, because they are at every turn thrust upon our notice. To see the pages of a volume which deals with "the more important and difficult topics concerning the relation of Religion and Science" strown with interjected "applause," "sensation," and "laughter," might give the impression merely of something out of the common way in the lecturer or the audience. But when we read in the publishers' prefatory note that these expressions, which enlivened the newspaper reports, were retained in the volume *because* "Mr. Cook's audiences included, in large numbers, representatives of the broadest scholarship,* the profoundest philosophy, the acutest scientific research, and generally of the finest intellectual culture, of Boston and New England," and because it "seemed admissible to allow the larger assembly to which these lectures are now addressed to know how they were received by such audiences," we get a new sense of the importance of the "*laudatur a laudatis*" maxim, and we turn with interest to the paragraphs which have received such distinguished approval.

Some of them appear to be bald truisms or platitudes, and one comes near to being a recommendation of a particular physician.

"We stand before structureless bioplasm, and see it weaving organisms; and we are to adhere, in spite of all theories, to the Ariadne clew, that every cause is to be interpreted by its effects, and that all changes must have adequate causes." (p. 100.)

* We are curious to know what kind of sensation this scholarship manifested at the announcement of the derivation of "*Bathybius*, from two Greek words meaning deep and sea!"

... "We are to adhere to the first of all logical laws, that, whatever stands or falls, a thing cannot be and not be at the same time and in the same sense." (p. 226.)

"I only ask that you should apply here the stern law of Newton, that where cause and effect are conjoined, the taking away of the former produces the cessation of the latter. We take away the cerebral hemispheres of the fish, the frog, the pigeon, the rabbit; and the animals invariably become mummies from the loss of all power of originating muscular movements." (p. 256.) [Has the mummy simply lost the power of originating muscular movements?]

"I am proud to say that I have some acquaintance with Hermann Lotze, and that I regard him as the rising, as Germany regards Herbert Spencer as the setting, star in philosophy." (p. 103.)

"If Hermann Lotze, the first philosopher of Germany, were on this platform to-day, he, in the name of the axiom that every change must have a sufficient cause, would thus and thus (tearing the paper) tear into shreds the materialistic or mechanical theory of the origin of living tissues and of the soul." (p. 117.)

"Do not think I speak from prejudice in the assertion that there is no profession, unless it be the legal, better trained in logic and philosophy than the ministerial. . . . No doubt we have sometimes taken brick that were poorly baked; and I think that is our chief trouble to-day." (p. 262.)

"One of the most distinguished theological scholars in this country, whom, out of reverence, I will not name, was afflicted nervously and threatened with loss of sight. Physicians in this learned city and in Paris again and again prescribed for him, but fruitlessly. Dr. Lionel Beale in London was recommended to him, and one hour of examination was followed by a single prescription, which was effectual, and has been so year after year through a quarter of a century." (p. 107.)

On the other hand, a fling at "the editor of the *Nation*" also elicited applause accompanied by laughter. It is equally accorded to philosophy of very dubious orthodoxy, such as the suggested immortality of brute animals, to more than doubtful scientific statements, and to rhetorical outbursts such as the following sentence, which also contains one out of many delusive assertions as to what has been done, or may be expected from the microscope and scalpel.

"The externality and independence of the soul in relation to the body are known now under the microscope and scalpel better than ever before in the history of our race. [And elsewhere, "that the microscope begins to have visions of man's immortality."] Exact science, in the name of the law of causation, breathes already through her iron lips a whisper, to which, as it grows louder, the blood of the ages will leap with new inspiration. Before that iron whisper all objections to immortality are shattered." (p. 212.) And so on.

So too of the unguarded exposition of the philosophical speculation of the spiritual origin of force (which in itself and properly formulated it is not for us to decry), . . .

"That wherever we find heat, light, electricity, we infer motions of the ultimate particles of matter as the cause; and that wherever we find motions we infer pressures as the cause, and that wherever we find pressures, we infer WILL as the cause."

And this is declared to be "cold, exact science," arrived at inductively from the axiom "that every change must have an adequate cause;" and a distinguished professor is held accountable for this because he assumed as a postulate (not as an axiom or self-evident proposition) the spiritual origin of force. The applause which cheers the blundering statement is not wanting when, further on, the lecturer in the name of science, runs this doctrine directly into pantheism (which, as he tells us, on p. 279, is the assertion "that natural law and God are one") in the following general conclusion :

"Matter is an effluence of the Divine Nature, and so is all finite mind, and thus the Universe is one in its present ground of existence and in the First Cause. In a better age, Science, lighting her lamp at that Higher Unity, will teach that although He whom we dare not name transcends all *natural laws*, they are through his Immanence, literally God, who was, and is, and is to come. Science does this already for all who think clearly." (p. 270.)

What are we to think of the taste and the spirit of the lecturer who retails a newspaper report—in its nature scandalous—of a private conversation in which Carlyle was said to pronounce the Darwins to be "atheists all," and then calls upon "tender and thoughtful souls" to "listen to Thomas Carlyle as he stands upon the brink of eternity," the lecturer at the same time saying that *he* himself does not call Darwin an atheist, and in a former lecture adducing reason to think he is not! And finally, under cover of a publishers' note, comes the endeavor to make "the finest intellectual culture of Boston and New England" responsible for a round of ignoble applause!

It is possible, and we would fain hope, that the audience are relieved from responsibility in one case, to which we prefer only briefly to allude, that in which, on pages 115, 116, the lecturer brings "the latest science" to bear upon the miraculous conception of Our Lord by suggesting an analogy in the parthenogenic development of silk-worms and drone-bees. What shall be thought of the taste and the logical understanding of a Christian believer who could "approach the topic of

the origin of the life of Our Lord on the earth from the point of view of the microscope," and could suppose that what is to us the supreme miracle (or otherwise is to us nothing) is to be illustrated by means of an "example," and made credible to unbelievers by comparison with a natural process? To this exposition the word "sensation" is appended, and we are at liberty to believe that the sensation expressed was that of reprobation and disgust.

There have been courses of lectures "on the more important and difficult topics connected with the relation of Religion and Science" (p. vii), on the Christian evidences, and on the doctrine of immortality, delivered in Boston to such audiences as those above referred to, in former days, by President Walker, Bishop Potter, President Wayland, President Hopkins, President Chadbourne, and later by President Porter and Professor Fisher, some of which have been printed, but none of which sought or received and recorded such plaudits. But then they did not contain such sentences as these, they never attempted to prove the immortality of the soul by the microscope and scalpel, nor made a pretence of demonstration by "exact science" and "haughty axiomatic certainty" upon subjects and in regions where demonstration in this sense, and haughtiness in any sense, are out of place. We can well imagine that the intellectual culture of Boston will carry lightly its share of the burden imposed by the publisher. But, considering the position which "the Lectureship" assumes, and seemingly is warranted in assuming, its orthodox supporters may have some reason to say, in the words of the town clerk of Ephesus, "We are in danger to be called in question for this day's uproar." Sooner or later this very sensational biology will be coolly examined, and probably mercilessly dissected by unfriendly hands. It were best that any needful disclaimer from the orthodox community should not wait for this. We have done our present and somewhat ungracious duty in suggesting that this contribution of science to sound doctrine comes in questionable shape. We include the substance as well as the embellishment of the argument. The intention throughout is unquestionably excellent, the taste and rhetoric simply execrable.

For our present purpose it is not necessary to enter upon a detailed examination of the several lectures. They may be generally good in spite of serious faults. But, as the strength of a chain of argument will be taken to be only that of its weakest link, and of each argument only that of its weakest part, those who are putting their trust in these argumentations and may be some day confounded by a hostile demonstration, should wish us now to point out, in some particulars, their weaknesses and demerits rather than to extol their merits.

The first three lectures are upon Evolution and Evolutionists; the fourth upon the Microscope and Materialism, and the same title might be extended to the succeeding lectures from the fifth to the eleventh; the twelfth is upon Emerson's views of immortality; and the thirteenth is entitled Ulrici on the Spiritual Body. If the latter lectures are remote from biology, the same might be said of a large part of the rest. Indeed, the speculations of Ulrici and his compeers on the "soul-fluid" "or non-atomic ether," of which "the soul *must* be conceived either as a property or occupant," may as well be ranked under biology as under philosophy; for in the opinion of Hamilton, whom the lecturer pairs with Ulrici, as two leaders of thought who can walk through the intricacies of philosophy without bewilderment, the Ulrician hypothesis is not worth consideration. We have no objection to Mr. Cook's bringing before a popular audience the speculation of "an invisible middle somewhat" between matter and mind, and of connecting this with St. Paul's declaration that "there is a spiritual body." But in the name of biology, philosophy, and religion alike, we must reprobate his representation of it as an outcome of exact science and as "proclaimed in the name of philosophy of the severest sort." It is philosophical charlatany to announce that in all this "we are following haughty axiomatic certainty;" that, "In clear and cool precision science comes to the idea of a spiritual body;" that "The self-evident axiom, that every change must have an adequate cause, requires us to hold that there exists behind the nerves, a non-atomic, ethereal enswathement for the soul." It is scientific charlatany, as those who applaud it should know, to lay "hand on colored diagrams of living tissues" and announce all this as the latest

whisper of science upon the inspired doctrine of the resurrection; that science, "*in the name of the microscope and scalpel* [the italics are ours], begins to whisper what revelation ages ago uttered in thunders, that there is a spiritual body with glorious capacities."

The assertion or direct implication is, that by biological investigation, aided by the microscope, we have arrived or may arrive at proof, not only of the immortality or continued existence of the human soul, but of its "enswathement" in a spiritual or ethereal non-atomic body. We do not stop to ask whether this does bring "entire harmony between the latest results of science and the inspired doctrine of the resurrection." But it is time to ask what Mr. Cook's qualifications for biological research are, and from what biological premises he demonstrates the immortality of the soul.

As to the first, the lecturer on p. 234, declares himself properly conscious of the fact that he is no microscopist; but he proceeds to say that he had enjoyed the opportunity of using the best microscope in Boston, and "that, only the other evening," he "saw living bioplasm pass and repass through the field of this exceptionally excellent instrument. I have read all Beale says of bioplasmic movements; I had impressed upon myself the intricacy of the work done by the bioplasts; I had minutely studied the best colored plates; and I thought I knew something of the difference between the action of life and of that of merely physical force; but when I saw bioplasm itself in movement, I felt myself in presence of an entirely new revelation of the inadequacy of materialism," &c. We are not so much surprised as the lecturer seems to have been that he got a more vivid idea by seeing the thing than by the study of a picture of it; but we are surprised to find that this "new revelation" came to him "only the other evening," that is, some time before the tenth lecture was delivered,—rather late to be vividly impressed with such an elementary show as a sight of bioplasmic movements, and to confirm the inference that they are vital and not mechanical. So we turn to an earlier lecture, in which, on p. 100, Mr. Cook himself propounds the question, "What right have I to know anything about physiological and microscopical research?" The answer he gives—

and this is all, so far as we can gather it—is that he is acutely sorry his hearers may not have heard of Hermann Lotze, the most renowned of German philosophers, a great physiologist as well as a great metaphysician; that “he taught me, among others, to look at this border-land with all the reverence with which we bow down before the Almighty God.” (p. 102.) A proper attitude in the border-land between physiology and metaphysics, and not incompatible with, though it does not give, an elementary acquaintance with biology. Searching for the evidence of such acquaintance, we are told that “this Boston Lectureship is abreast of the latest German investigation.” Throughout “the Lectureship” is synonymous with the lecturer, being a favorite device by which he may modestly speak of himself in the third person, and also imply that this person is an institution. We clearly gather that this advanced position in biological knowledge was acquired by the study of textbooks, and that, knowing nothing at first hand, it was made secure by the process of elimination, that is, by the adoption of “an inflexible rule not to trust any man’s authority as to facts in science without advice to do so from his determined opponents.” (p. 107.)

Not a bad idea under the circumstances, and it much simplifies the case. The lecturer’s results, then are derived from those facts in biology which nobody disputes. What are these results, and how are they reached? We will notice only those with which we have occasion to concern ourselves. We are not concerned, when we read the lecture on the Microscope and Materialism, with such a seeming conclusion as, “that the transformation of the not living into the living occurs in the bioplasts instantaneously.” If it means that a particular molecule when it becomes a part of a living organism or of living matter does so at some particular instant, that simply must needs be; but if the proposition means anything else, there is no proof of it one way or the other. Nor need we consider the closing proposition of the lecture, “that the plan of the whole organism is necessarily taken into view from the first stroke of the shuttles of the bioplasts that weave it.” That is the orthodox inference, supported, we think, on just philosophical grounds; but it is mere pretence that the micro-

scope has ever given us any new evidence, i. e. any new kind of evidence, in favor of it. When he affirms, "every change must have an adequate cause; and [apparently used in the sense of therefore] the organic living cell must have outside of it a God and inside of it an immaterial principle, to be accounted for under the law of causation," we do not know whether he is expressing an opinion or imagining an argument. He adds in italics that "if life may exist before organization why not after it?" One might ask why should it? The lecturer's answer is, "I affirm that the microscope begins to have visions of man's immortality." What are the visions based on? We must go on to the seventh lecture before we reach any statement which bears upon the question. It comes in the form of another affirmation.

"I affirm that we have under the microscope ocular demonstration that it is life which causes organization, and not organization which causes life." This proposition is, as the lecturer over and over says, the generally received opinion. No one before ever pretended that the microscope gave ocular proof of it. Mr. Cook does, and the proof is: "We fail, Huxley says, 'to detect any organization in the bioplasmic mass.' But there are movements in it and life. We see the movements: they must have a cause. The cause of the movements must exist before the movements. The life is there before organization. But if life may exist before organization, it may do so after it, or outside of it." (p. 151.)

This "ocular proof," which also carries with it—as is here intimated and as we see farther on—the whole substance of the lecturer's supposed demonstration of what he calls the externality and independence of the vital principle, and of the immortality of the soul, turns out to be only an inference. It is, moreover, a negative inference. We fail to detect any organization in the protoplasmic mass under certain powers of the microscope, so we infer that there is none. Well, with the naked eye we fail to detect any organization in the animalcule. We fail even to detect the animalcule! On the other hand, Mr. Cook is eloquent on the difference between what he saw with a $\frac{1}{2}$ inch objective and what he, or rather Dr. Beale saw, with a $\frac{1}{8}$ inch. Should he not infer that a $\frac{1}{8}$ inch might reveal

more? Then, again, there is a fallacy here, growing out of the meaning of the term organization. As used by Huxley, the term may be supposed to mean cellularity, or such organization as a protoplasmic mass gives rise to in its further development. In the lecturer's argument it stands, if the argument is valid, for any structure in which vital activities may be manifested, no matter how intimate or molecular; and where then is the evidence or the likelihood that the life existed before the organization, and was not rather co-existent with it, or even the product of it.

It may now be perceived that not only has Mr. Cook no ocular proof of his proposition, but even no inferential proof of it. Any one has a crude idea of the materialist's resources who supposes that anything is achieved by dislodging him from such outworks as the visible structural organization. The materialist never supposed that the life was a product of this. He is as familiar as the lecturer is with those protoplasmic masses, humorously described on p. 152, which move freely, and change their form variously, and pick up lifeless matter to transform it into living matter like themselves, and throw off smaller masses which go through the same motions again, which in fact, without visible structural organization, perform all the essential functions of living beings. He too says that "they have very complicated machinery in them;" and he rightly says that this machinery is in their molecular forces or endowments, not only in these *primitiæ*, but equally so in the completed plant or animal of higher development. The lecturer has missed all his vaunted proof, for he is unable to show with his microscope or by any logical inference that such life either precedes the organization which manifests it, or may exist after it or outside it. He cannot even bring this into the shape of a reasonable conjecture. We are hasty; we find that he does get at it by logic, on p. 155.

"Bioplasm exhibits peculiar actions found nowhere in not-living matter."

"For each class of these peculiar actions there must be a peculiar cause."

"That cause must be either matter or mind."

"But the cause has qualities which cannot, without self-contradiction, be attributed to inert matter."

"It must therefore exist in the life, or an immaterial element of the organization."

"An immaterial element exists, therefore, in living organisms."

And he must add, as in the first premise, bioplasms. He has, to be sure, no microscopic proof left that this bioplasmic life existed or may exist before the bioplasm; but the chain of argument (which involves other curious things, if we could only stop to notice them), naturally takes on the final link,—this element, being immaterial, may survive the corporeal bioplasm, or exist outside it. Q. E. D.

Indeed it is bound so to survive by the whole force of Mr. Cook's argument, here and elsewhere. Think of the disembodied spirits or vital immaterialities of all these bioplasms! Yet not perhaps altogether disembodied and bare; for Ulrici and Mr. Cook may, for all we know, fittingly clothe them in a non-atomic, ethereal enswathement.

We do not overlook another *catena* (on p. 154), preceding the one which we have been displaying:

“Matter in living tissues is directed, controlled, arranged, so as to subserve the most varied and complex purposes.

“Only matter and mind exist in the universe.

“Matter in living tissues must therefore be arranged either by matter or by mind.

“No material properties or forces are known to be capable of producing the arrangements which exist in living tissue.

“In the present state of our knowledge, these arrangements must be referred to mind or life as their source.”

Why interpolate “or life,” the life being the thing to be accounted for by mind? Without those words we should understand that the Divine Mind was looked to; and this would be an orthodox exposition, having nothing to do with the immaterial and inherently immortal vital principle of bioplasms. With them, the *catena* looks as if meant to be connected with the immediately following one (already cited), which lands us among these bioplasmic ghosts. Do not suppose, however, that the lecturer is at all afraid of such microscopic ghosts, for when this Ariadne clew which he follows logically leads him to face the more considerable ghosts of departed instincts, he faces them without misgiving, and, supported on the one hand by the expressed wishes of Agassiz and on the other by the poetry of Tennyson, rather hopes that “this highest conception of a paradise” stocked with them “may be the true one.” We are not clear that this is orthodox company. We are clear that there is no need to entertain it.

"Let us seek first clearness, whether the heavens stand or fall," cries the lecturer (p. 265). To the heavens it may not greatly matter whether Mr. Cook's ideas are clear or turbid; but it does matter to his readers, and they may agree with him that clearness is very much wanted. It might conduce to clearness, and perhaps lay these ghosts of departed bioplasts, if the lecturer would review his line of argument, and see what it really amounts to. We are not sure that he has proved anything; but he has illustrated some things.

First and foremost, he has illustrated, by example of a complete failure, a principle clearly stated by Dr. McCosh, viz., that:

"It is in vain to expect demonstration in every line of inquiry. Demonstration is confined to a limited class of objects, and these characterized by their simple and abstract nature. In most of the sciences it is not available; it cannot be had in chemistry, in natural history, in psychology, in political economy."

Also he has very well illustrated the insuperable difficulties of an atheistic interpretation of nature. If he had been content with this, and with setting forth the essential reasonableness of the theistic and Christian interpretation, and parrying biological and other objections to it, he would have made an excellent use of his remarkable expository and rhetorical powers. But, instead of simply holding fast to that which is good, he must needs "prove all things," even the deep things of God, from the point of view of the microscope. Evidences of theism are no doubt revealed under the microscope, but no more cogent ones, and no other in kind, than those revealed to the naked eye. Indeed, for the lecturer's purpose testimony from the obvious and patent should be better than that from the minute and the obscure, especially when the facts on the one hand are "known and read of all men," and on the other are read in books and their correctness certified by the process of setting one writer or investigator against another. For proving the doctrine of the immortality of the soul, how much better is a man than a bioplast! But, in short, so far from proving the immortality of the soul and living principle by a logical treatment of facts revealed by the microscope, the lecturer has not even proved, but by his process rather obscured, the doctrine—generally received, even by most of the biologists he opposes—that organization is the product of life rather than life the product of or-

ganization. Still less, as we have seen, has he proved the externality, independence, and consequent immateriality of the living principle in plants and animals. His attempt at doing so, for the purpose of thence deducing the doctrine of the immortality of the human soul, logically concluded in linking its fate with that of the vital principle of the lowest animals, vegetables, and formless bioplasts. And all to no purpose; for no such "*animula vagula blandula*," could testify in behalf of personal and conscious immortality, which is our desideratum.

But the lecturer has himself indicated a fair mode of extrication from this predicament, and it is a pity he did not see his way to use it. Taking his cue from Herschel, he asserts:

"All the power we have is delegated power. We received it all from Almighty God. His force is all the force there is in the universe, intellectual or physical." (p. 179.)

Well, if this is delegated power we hold, the only pertinent inquiry as to its duration rises upon the terms of the lease. Upon this we may be sure the microscope will give us no information. We may connect that philosophy with the Christian doctrine of immortality. Mr. Cook's line of argument connects itself with, or rather rests upon, the old heathen conception of an inherent and necessary immortality, and involves eternal pre-existence as well as post-existence.

So when the lecturer reiterates: "If death does not end all, what does or can?" we reply, first, that he has produced no biological proof or valid presumption that it does not end all: secondly, we reply that God can, and not improbably will, end at death all protoplasmic and unconscious existences by the termination of the lease.

We have neither space nor inclination to review Mr. Cook's lectures on Evolution. The topic has been worn thread-bare. The lecturer has prefixed as a motto Professor Huxley's admission that teleology, in its best sense, is not touched adversely by anything the evolutionist can bring to bear. So we may watch the battle with comparative unconcern. Still those who choose to enter into the fray ought to be well armed. Wherefore we deprecate the lecturer's advice to the clergy, "that at times the pulpit should show that it is not afraid of these topics." Perhaps there is more call for us to prove our wisdom than our

courage. Even Mr. Cook, with his abounding information, appears to run some needless risks. We do not quite like the look of this highly applauded challenge.

"If evolutionists can by selective breeding produce from the same stock two varieties so widely differing that their crossing would produce sterile hybrids, then I will say that they have scientific right to fill up by deduction the gaps in the direct evidence of evolution, and not till then." (p. 68.)

The gap upon which interest is concentrated is that between apes and men.

Under one view, the lecturer might feel secure. For the challenge, with proper preamble, amounts to this: You evolutionists assert that in the course of an unknown but very great number of years, and under prolonged changes of conditions and circumstances, the descendants of certain individuals of common parentage have varied divergently to such a degree that in some cases they will not inter-breed, and in others where they do the offspring is commonly sterile. Now show me this experimentally, take two stocks from the same parent and produce in a few years what you say is the result of very many, and then I will accept your deduction that apes and men came originally from a common stock. But yet this may be hazardous. We should not like to declare that this gap may be considered as deductively bridged whenever the descendants of two plants of the same parentage shall have acquired such difference of constitution that they fail reciprocally to fertilize each other, or in which the fertilization results in impotent progeny. There are said to be plants in cultivation which are sterile or all but sterile to their own pollen but fertile with that of a related species. There are said to be wild plants around us in which if we take two individuals exactly alike they will only imperfectly interbreed. There are all gradations between the complete fertility and complete sterility of hybrids. So that, if gardeners were to undertake to breed to points of infertility, we should not wonder if in some instance they brought it to pass.

Finally we are not well assured about the lecturer's definition of a species: "a real species will be conterminous with the outermost limits of ascertained variability." This is implied to be a new definition. As in the more obvious sense it is not, it

may be meant to bear a sense which, when the breeders have done their work, may prove disagreeable. Still, as before, it seems to afford a safe and ingenious shelter under which to say: "grant me this definition and I will stand with established science on the fact that we have no direct evidence that any real species, thus defined, has ever been transmuted into another species." For however wide the difference between any two forms may be, whenever the gap is bridged over from form to form by intermediates, contemporary or fossil, it will thereby follow from the definition that the forms aforesaid are of one species. Therefore there has been no transmutation of species, only the limits of variation have been extended. But so equally, when the breeder has met the challenge thrown out, and thereby entitled the evolutionist to fill a certain gap by deduction, only the limits of variation of species have been extended across the chasm, and the man and the ape are shown to be of one species. If we must choose between the two, we prefer the hypothesis and the logic which are satisfied with a far more remote relationship.

In serious earnest we think that this production is not one for orthodoxy to be proud of, and that it is best to declare this opinion plainly, and promptly. *Liberavi animam meam.*