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CREATION AND PROVIDENCE, WITH SPECIAL REFERENCE TO THE EVOLUTIONIST THEORY.

By JOHN ELIOT HOWARD, F.R.S.

THOSE who had not the opportunity of attending the meeting of the British Association (that Wittenagemote or "assembly of wise men," as the Saxons would have called it) might reasonably look for some consolation in the perusal of the President's Address.

Such a hope is destined to disappointment. The address is filled with anatomical details suited only to students of medicine; but with the avowed design of inculcating upon all present a belief in the doctrines of evolution and development, founded on implicit faith in the statements put before them. Dr. Thomson directs attention to the effect which these theories, as advocated by Lamarck and others on the Continent, and by Wallace and Darwin since 1858, have had in unsettling the belief of many persons in the older doctrines, but does not seek to correct this aberration; leaving his hearers under the impression that "cautious naturalists," or, at least, "a large majority of them," are thus influenced. Creation and Providence give way to evolution and development. To be thus assured *ex cathedrâ* that we have been all wrong in our views of these most important subjects may be widely influential on minds disposed to bow down to authority; consequently, the President cannot complain if his statements are subjected to searching criticism, and shown to rest on no solid foundation.

Before entering on these questions, I must, therefore, venture some remarks on the style of reasoning of the Address

to which I have referred. The President is compelled, with apparent reluctance, to admit that "the evidence from direct experiment is such as entirely to shut us out from entertaining the view that spontaneous generation occurs in the present condition of the earth." Thanks especially to Pasteur and Tyndall, this has indeed been triumphantly demonstrated. But, having thus surrendered the very key of the whole position, Dr. Thomson devotes his elaborate attention to the defence of the outworks. He says, "*we* are not relieved from the difficulty of explaining how living organisms or their germs first made their appearance." Of course, "we" ("*evolutionists*," that is) are not. If spontaneous generation is not true, if *life* can only proceed from *life*, the whole doctrine of evolution fails at the very commencement. It is a very obvious and oft-repeated truth that no chain can be stronger than its weakest link, and the chain of reasoning above referred to is *entirely wanting* in the first link. It hangs upon nothing! It has no answer to the inquiry, "Whence is the origin of life?" and the speaker is driven in his perplexity to adopt the most unscientific of all assumptions for the solution of the enigma, the suggestion of the impossible, as follows:—"It might be held that the conditions affecting the combination of the primary elements of matter into organic forms may at one time have been different from those which now prevail, and that under these different conditions *abiogenesis* may have been possible, and may have operated to lay the foundations of organic life in the simple forms in which it first appeared,—a state of things which can only be vaguely surmised, but in regard to which no exact information can be obtained."

Science is founded on the observation of fact, but evolutionism on the hypothesis that the reverse of all known facts may have been at some time true; the whole conditions affecting the combination of the primary elements of matter are rearranged to suit the theory. The quiet *assumption* that "organic life first appeared in simpler forms" is to be noted, and then the *candid* admission that this can only be vaguely surmised, and "no exact information can be obtained."

The whole passage is so complete a specimen of evolutionist argument, that I have not hesitated to present it entire. It is proverbially true that a man convinced against his will remains of the same opinion; and this, evidently, is the case with the Doctor, who first tells us that *abiogenesis* is impossible, then assumes that at some past period it *may* have been possible, then that it *must* have existed, and then that what

we want now to complete the proof is exact information *how* it existed. I extract from a recently-published work by Mr. Darwin, a specimen of the kind of reasoning objected to. In speaking of the varieties of Primula, he says:—"We may freely admit that *Primula veris, vulgaris,* and *elatior,* as well as all other species of the genus, are descended from a common primordial form, yet, from the facts above given, we must conclude that these three forms are now as fixed in character as are many others, which are universally ranked as true species. Consequently they have as good a right to receive distinct specific names as have, for instance, the ass, quagga, and zebra."*

It is always the same—*facts* on one side, *theory* on the other. On the *ipse dixit* of Darwin we may "*freely admit*" that of which no proof can be given, and which is the direct reverse of all present experience! Such is the faith that Darwin looks for (and not in vain) from his followers!

If we extend our inquiries over past ages to search for some justification of evolutionist assumption, we find, as in a valuable Address † just put into my hands, that "the whole evidence supplied by fossil plants is opposed to the hypothesis of genetic evolution, and especially the sudden and simultaneous appearance of the most highly organized plants at particular stages in the past history of the globe, and the entire absence among fossil plants of any forms intermediate between existing classes or families. The facts of palæontological botany are opposed to evolution."

I shall endeavour to show that there is an ORDER and a DESIGN, and a FIXEDNESS in nature quite irreconcilable with the essentially atheistic doctrine of a self-evolving and continually-changing universe.

To quote the words of a Fellow of the Royal Society in 1682:‡ "To philosophize is to render the causes and ends of things. No man, therefore, that denieth God can do this truly. For the taking away of the First Cause maketh all things *contingent.* Now, of that which is contingent, although there may be an *event,* yet there can be no *reason* or *end;* so that men should then study *that which is not.* So the causes of things, if they are contingent, they cannot be constant. For that which is the cause of this now, if it be so contingently, it

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* *The Different Forms of Flowers.* 1877.

† *Fossil Plants and their Testimony in Reference to the Doctrine of Evolution.* By Wm. Carruthers, F.R.S., &c.

‡ *The Anatomy of Plants.* By N. Grew, F.R.S., &c. 1682.

may not be the cause hereafter; and no physical proposition grounded upon the constancy and certainty of things could have any foundation. He, therefore, that philosophizeth and denieth God, playeth a childish game."

For myself, I accept Creation as the exposition of the *mind* of God, and Providence as the expression of His ever-acting *will*. I ascribe all the varied forces and powers to the effect (mediate or immediate) of this *one* will, and I rest content in this philosophy.*

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* There is one verse in Psalm xxix. which I must specially dwell upon, as illustrating this subject in a manner most powerfully calculated to arrest the attention. It forms part of the Sabbath morning service in the Synagogue, and the translation given in the prayer-book of the Jews is very much better than our version. The quotation-marks indicate passages taken from the Jewish prayer-book, "The Daily Prayers." London: 5602, page 114. The "sons of the mighty" are called to ascribe all the glory to Jehovah, whilst the storm arises in might and power from the Mediterranean—"the great waters." It then "shivers" the cedars of Lebanon, and makes the mountains to skip like the young unicorn. "The voice of the Lord flasheth flames of fire," "causing the wild deer to start," and "stripping the forests bare," until at length the fury of the tempest expends itself, after rolling over the land from the north, in the far-distant southern wilderness of Kadesh. The conclusion of the Psalm tells us that "Jehovah sat enthroned at *the deluge*," and Jehovah "will sit as enthroned King for ever." From this reflection arises the peaceful rest of His people in every storm (physical or moral). Jehovah will give strength unto His people, Jehovah will bless His people with peace. Psalm xxix. is grand in all its parts, but perhaps especially so in the thought (ver. 9) which it encloses and illustrates, "whilst in His temple everything declares His glory." The whole visible creation is here (as elsewhere) looked upon as *a temple*, and all the varied changes which it presents as instructing us in the glory of Jehovah. Into this temple we are introduced at our birth, and it is of immense importance that we should conduct ourselves therein as *worshippers*, that we should reverence the Creator, and treat with respect, as pertaining to Him, the creatures of His hand. When the mind has been overpowered by the grandeur of His works, the heavens, the moon, and the stars which He hath ordained, it is ready to question whether man, the small and apparently insignificant point in the vast spectacle, can really be the object of so much regard on the part of his Creator. But faith dissipates these fears, and shows us the position of man as really that of God's manifested king on earth, made to have dominion over all the works of His hands, and to render back the praises of all the earth to the Author of his being (see Psalm xix.). In the Psalm we have been considering, the angels, as "sons of the mighty," are called upon to adore the majesty of Jehovah. It is not impossible, since the Deluge is expressly mentioned, that a contrast is intended between Jehovah the enthroned king sitting unmoved and pre-eminent above the water-floods, and the heathen accounts of the same, with which David, from his Moabite ancestry, might be familiar. "The raging of a storm in the morning arose, from the horizon of heaven extending and wide. *Vul* in the midst of it thundered, and *Nebo* and *Saru* went in front, the *thronebearers* went over mountains and plains, the destroyer *Nergal* overturned." (The Chaldean account of the Deluge, *Bib. Arch. Trans.*, vol. iii. p. 551.) The heathen deified all the powers of Nature, but the chosen nation saw them all summed up in Jehovah. Hence

The Temple of Nature.

When I use the term Nature, I speak only figuratively, and not of any real existence; but I am unable to define to myself the exact meaning of the term, as it is frequently employed; for example, "the laws of Nature" would seem to imply that Nature was an existence of some kind capable of receiving and obeying laws. "The reign of law" in like manner, after all the explanation of the very able author of the book published under this name, does not seem to me capable of logical interpretation. "Force," as used by other writers, expresses a thought which has to be harmonized with the view above stated, unless "force" is conceived of as an existence apart from God. "Natural selection" implies the continual superintendence of some intelligent power, and cannot be supplemented by the improvement suggested in the change to "the survival of the fittest"; which, unless it be the jejune proposition, that those survive that do survive, is not true in Nature, as I shall presently show.

Thus the common plant *Lythrum Salicaria* is, according to Darwin,* "in that state in which Natural selection might readily do much for its modification"; but "Natural selection" has probably enough on her hands already, and *Lythrum*

I suppose arose the term *Jehovah Zebaoth*, which we translate "*the Lord of Hosts*." I do not find this term in the law (strictly speaking), as it comes in with the Book of Samuel. Before this time I read of "the host of heaven," the stars as worshipped by the nations; but in proportion as Israel was brought into manifest conflict with idolatry does the above expression come into prominence, becoming very frequent in the latter prophets. The revelation made to Moses in Exodus is strictly monotheistic. The "I Am" who then manifested His glory is "the blessed and only Potentate," Lord of angels, and of all created intelligences. Whatever further development of the knowledge of God was afterwards afforded must be taken in connection with this fundamental truth.

Wisdom is described in the Book of Proverbs as the wonderful artificer of the works of God, as His delight rejoicing ever before Him. I suppose that in man, as formed after the image of God, there is some faint reflection of this glorious truth. I am not called upon to elucidate the revelation foreshadowed in the Old Testament, but distinctly enunciated in the New, of "the Word who was with God, and was God," although the truth further expressed that "all things were made by Him, and without Him was not anything made that was made," might easily tempt me into regions of thought that I must not enter. My simple object is the monotheistic view of creation grandly brought out in the worship of the elders in Revelation (chap. iv.). "Thou art worthy, O Lord, to receive glory and honour and power: for Thou hast created all things, and for Thy pleasure they are and were created."

* *Different Forms*, &c., p. 149.

Salicaria remains the same, and seems likely to do so to the end of the world's history.

There is a statement in Genesis (ii. 3) which the best Jewish commentators* understand to mean that God created all His work "*thenceforth* to act"; that, having created the universe and all that it contains, the production of something out of nothing ceased, and the increasing reproduction of something out of something commenced.

"The works of Jehovah are great, sought out of all them that have pleasure therein." This expresses the reverent delight of man as a worshipper in the temple of Nature. Every fresh investigation of the works of God tends to exalt the glory of the great Creator. His wisdom is seen to be indeed infinitely varied,† and its effects are shown in the adaptation of means to an end worthy of Himself; and that is His own glory. Here the mind can rest as on an adequate explanation of the great enigma.‡

An evident design to clothe the rugged material of the planet we inhabit with the forms of vegetable and animal life in such rich luxuriance as to leave no part tenantless and void, is apparent to those who have pleasure in the works of God; for in whatever direction we turn our view, even in the most unexpected situations, we find the wonderful Artificer glorifying His own skill and delighting our minds with the contemplation of life adapted to the circumstances.

If the Arctic regions are explored, the extreme cold does not altogether prevent the putting forth of such forms of life, animal and vegetable, as are suited to this ungenial clime. If, on the other hand, we examine those hot and almost boiling springs, which disengage themselves from the bowels of the earth and spread an abnormal temperature around, even there some species of confervæ will be found adapted to the more than tropical warmth.

If we sound the mighty ocean, and bring up the ooze from its profoundest depths, we find abundant traces of life, vigorous, self-sustaining, self-enjoying, and presenting such forms of beauty as to delight the eye of the microscopist, to whom alone (as in the *Diatomaceæ*) these forms can ever be revealed.

If any phase of things is under our view, such as we have not before contemplated, we still perceive that all is arranged

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* *V.* De Sola, *Genesis*, p. 5.

† ἡ πολυποίκιλος σοφία τοῦ Θεοῦ.—Eph. iii. 10.

‡ So Linnæus. "Finis creationis telluris est gloria Dei ex operâ naturæ per hominem solum." (*Introitus Sys. Nat.*)

with harmonious adaptation of every part to the mighty whole, in such a manner as to place before the attentive mind the *evident* proof of the continually operative superintendence of a providing and sustaining Power watching over the creatures of His hand.

If a mighty forest be consumed by fire, forthwith there springs up from germs, concealed perhaps for thousands of years, a new vegetation ;* and, connected with this new vegetation, varied stores of animated life present themselves to our view.

If a volcanic island rises from the bosom of the sea, soon these desolate heaps of scoriæ and pumice show the first indications of a process which will eventually clothe them with beauty, and render this unpromising abode the fit receptacle of the stores of animated Nature, and finally of its master—man.

Or, on a smaller scale, if an infusion be prepared of some vegetable substance, how soon do we find this diminutive ocean filled with varied forms of life—life active, organized beings full of conscious enjoyment! Thanks especially to the admirable researches before referred to, we now know that these creatures are all the result of *life* proceeding from anterior *life*—that no such thing exists as matter setting to work to organize itself; but how wonderful the provision of germs and spores, by means of which the *vacuum* so soon becomes a *plenum*, unless the most elaborate care is taken to exclude the access of air containing these life-conveying particles.

It is most interesting to trace out the manner in which Nature sets to work to clothe with vegetation the pebbly shores from which the sea has retired, as is the case on some parts of our coasts. The early beginnings make the mind wonder at the presence of the germs and seeds of the suited plants, brought together apparently by a fortuitous concourse of events, but none the less evincing design in their very adaptation to the purpose in view; whilst the beauty of some of them, such as the horn-poppy, the sea-thistle, the sea-pink, and the maritime bindweed, can only be explained on the principle that God delights to adorn the waste places of the earth with beauty.

A similar remark may be made in reference to the cryptogamic vegetation which embroiders the mountain rocks and boulders. Till quite recently the beauty of these minute organisms and their marvellous adaptation each to its peculiar habitat were things of no moment to mankind. On utilitarian

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* Appendix A.

principles it would be difficult to find a reason for their existence. Why should the barren rocks be made to yield a treasure of delight for some half-score of naturalists in this late period of the world's existence ?

The explanation of the varied aspects of the Cosmos, the beautifully adorned world we live in, is given us in Psalm civ., where everything is traced to the great First Cause, the Eternal and self-existing Jehovah. The psalm is the happy expression of a soul in conscious knowledge and enjoyment of the presence *sought* and not *shunned*, of the beloved object of its affections. "Bless the Jehovah, O my soul, O Jehovah my God, Thou art very great, Thou art clothed with honour and majesty." If this, as the *utterance of an unknown writer, came before us for the first time*, our reasonable course would be to inquire what he has to say in illustration of the proposition which in his language of praise he puts before us. Does he sustain this magnificent beginning, so that his hearers should be able, according to his express desire, at the close to praise Jehovah with him? *Science* cannot decide the question, it must be left to *faith*. Science and faith are not in opposition here, but science is simply dumb, as incompetent to discuss the subject.

It is said that when Laplace was introduced to Napoleon, the Emperor objected to the great astronomer's having framed a scheme of the Universe, without the existence of God, and that the reply of this latter was, "Your majesty, *we had no need of this hypothesis*." Such was his opinion, but it was not that of the Emperor, nor is it the opinion of the most intelligent of mankind, to whom the notion of a self-evolving and self-regulating Universe is not only inadmissible but absolutely *unthinkable*.

It must be admitted that the Cause referred to in Psalm civ. is capable of producing the effects, and that the effects give strong demonstration of the existence of the unseen Cause.

It is evident to me that the God of nature is the God of the Bible. The very points which sceptics select as their chosen themes of attack in the Scripture, have their exact parallel in nature. In that most wonderfully touching and sublime Psalm, the 90th, which commends itself to the inmost feelings of man's heart, as he follows his beloved ones to the tomb, we read, "Thou turnest man to destruction." This is a theme that must be dwelt upon with caution, and with reverence. In the pairing together of nature everything has its appointed *destroyer*. Wondrous skill is displayed in preserving the balance amongst the creatures. No fruitful source of over-

population is without some suited agent to check the evil. And the destroyers again are fitted in exactest adaptation to their work of limitation. If the horned snake of Egypt is fitted to hide himself amongst the sands of the desert, or from beneath his stony lair, "biteth the horses' heels, causing his rider to fall backward," on the other hand, the python serpent suspending himself amid the giant primitive forests of the islands of the East, resembling the branch of some harmless vine, thence springs upon the passing herd, and dispenses death unlooked for, but not the less sure.

Or if the gentle eye and elegant length of neck of the camelopard be suited to discern the foliage and take his pasture amid the branching forests of Southern Africa, and if his mottled form be so assimilated in colour to the aged and parti-coloured acacia as not to be easily distinguished—amidst all these beneficent provisions for his preservation, are there none for his destruction? Yes! the spring must be sought to quench his thirst at eventide, and there the gaunt destroyer, the king of beasts, with all appliances and aids for slaughter, shall drink his blood.

"The king of beasts," as we call him now, but what a diminutive creature compared to the destroyers of the primitive world, long ages before man trod upon its surface! I will not cite as an example the Saurian race, for the aspect of that age is too appalling, and man was certainly absent from the scene; but ask you to look upon the great cat of the caverns, and all the others with whose bones we are familiar; and who must have been ordained to limit the numbers of the quiet and peaceable *behemah*, or beasts of the field, lest these should overpopulate the earth.

We need not go so far for illustration, as the whole feline race are by nature formed especially as destroyers, and, let me remark, are some of the most perfect creatures in bone and limb of all the handiwork of God. Moreover, their fierce delight in destruction, and even, as in the common cat, in prolonging the tortures of their victim, results from their organization. If we look again at another familiar race of creatures, the spiders, we find marvellous display of the manifold wisdom of God in these really beautiful animals, whose diversified habits of ensnaring and cunningly captivating their victims are so well known.*

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* "Ainsi l'araignée, qui tisse sa toile et secrète un fil que nous ne saurions fabriquer avec toute notre science, est à elle seule une merveille de

Beautiful destroyers, in fact, abound everywhere. It is most interesting to watch the interweaving of these forms of danger with the harmless seaweed in the pools of ocean, and to pursue the theme by the aid of the microscope. If it were not for prodigious fecundity, we might marvel at the escape of any of these tiny and unprotected existences.

The vegetable creation is no exception to the rule of the existence of destroyers. In fact, the serpentine race have their exact parallel in those climbing plants which are designed to strangle and to overpower the nobler denizens of the forest. Even the strength of the oak is often poorly matched against the insidious advance and deadly embrace of the ivy.

Wherever man makes his way, he is prone to overturn the balance and harmony of nature. He has introduced the thistle, and the beautiful native vegetation of the South American plains is supplanted by this noxious weed. He has introduced the rat into New Zealand, and the curious native birds can no longer rear their young unmolested.* He strips the mountains bare of their forests, and arid plains take the place of fruitful and pleasant prairies; or he cuts down the woods, in order to deprive a conquered population of shelter, and converts a land, such as Ireland once was, into irreclaimable morass. The utter destruction of the enemy's country was often systematically pursued. Thus Assurbanipal says :—

> "For a month and a day Elam to its utmost extent I swept,
> The passage of men, the treading of oxen and sheep
> And the springing up of good trees I burned off the fields,
> Wild asses, serpents, beasts of the desert, "*Ugallu*,"
> Safely I caused to lay down in them."†

In very many regions of the old world, these desolations have left their effect till the present time.‡

Now in the view of the universal prevalence of destroyers, what becomes of the doctrine of "the survival of the fittest"? Is the cat more fit to survive than the garden warbler which it massacres? or is the man-eating tiger of India a more worthy survival than the native whom he carries off into the jungle?

Darwinism has never attempted to cope with the difficulty of explaining how the poison of the viper could be developed out of a harmless snake.

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création, qui cependant ne dépasse en rien un brin d'herbe, qui pousse, ni une branche d'arbre qui développe son fruit, au centre duquel est la semence qui doit se reproduire à l'infini."—*Monde des Atomes*, p. 3.

* Buller's *History of the Birds of New Zealand*, pp. 32, 93.

† *Assyrian Discoveries*, by G. Smith, p. 355. ‡ Appendix B.

The book of Genesis declares that God formed everything after its kind, or more properly, after its ideal type,* so that we have in the Bible a reasonable explanation of the fact, as above stated, that we have everywhere creatures formed to fulfil the purpose of keeping down excessive production.

In the symbolic aspect of nature these typical destroyers teach us invaluable lessons.

Σύμβολα γὰρ Πατρικὸς νόος ἔσπειρε κατὰ κόσμον.
For the paternal mind hath sowed symbols through the world.†

There is no mercy in the ordinary course of nature. Her language is "woe to the weak and to the miserable." As soon as health and strength decline, whether in the animal or vegetable creation, numberless destroyers seize upon their predestined prey, to hasten its exit from a world which the sickly one seems to disfigure by its presence; for nature is concerned for the perfection and continuance of the race rather than of the individual. At least it would be difficult to read in any other light the combats of the males in the season of erotic madness. It is obviously an advantage to the herd that the strongest should survive, but what are we to say about the defeated ones?

Nature buries her dead without the slightest regret at their departure; she wears no mourning, and does not even affect the resemblance of grief; for she is ever beautiful and ever young; all the sentimental ideas which we attach to her are without foundation in fact, and are only the reflection of certain qualities in ourselves. Nature is ever unfeeling, and if the earthquake wave or the Indian typhoon sweeps a hecatomb of victims to destruction, mingling the tiger of the jungle and the serpent of the forest in one common destruction with him who calls himself the Lord of Creation, it will not in the least diminish the cheerfulness of ocean when the storm is overpast. The "immeasurable laughter of the waves" ‡ will go on as cheerily as ever!

"O quam contemta res est homo, nisi supra humana se erexit!"
Linnæus (*Introitus*).

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* מִין Meen, "form; hence *species*, kind, sort; comp. *Greek* ἰδέα."—*Ges. Lex. in loco.*

† Oracles of Zoroaster. Cory's *Ancient Fragments*, pp. 100—106.

‡ Æschyl. *Prom.*, 89.

ποντίων τε κυμάτων
ἀνήριθμον γέλασμα.

Presumably the great Linnæus felt that fallen man needs a better gospel than Nature can supply. At all events, he trod with unshod feet the temple of Nature in the spirit of a devout worshipper. He describes himself as aroused to behold the eternal, immense, omniscient, omnipotent God, whom he says (in reference apparently to the vision of Moses), "I beheld from behind, and was astonished. I traced somewhat of His footsteps in created things; in all which, even in the very smallest and scarce perceptible, what Power, what Wisdom, what inextricable Perfection! I observed animals relying for their support on vegetables, vegetables on terrestrial things, terrestrial things on the world itself; but the world borne in its appointed course round the sun, from which it borrows its life: the sun finally revolving round its axis with the remaining stars; the system of stars, in courses and number not to be defined, all circling in the vast ether, upheld by the incomprehensible *Prime Mover*, the *Cause of Causes*, the *Preserver and Ruler of the universe*, and the Lord and Artificer of this piece of workmanship, the world:—without whom nothing exists; who founded and created the whole, and who both fills and eludes our sight; for He is only to be seen mentally, since He withdraws Himself into the sacred recesses of His own majesty, and gives no audience to any except in a spiritual manner. He is all Intelligence, all Sight, all Soul, all Spirit, all Himself. The conjecture of the human mind cannot trace out His lineaments, and is forbidden to form of Him any likeness."*

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* *Imperium Naturæ.*—"*Deum sempiternum, immensum, omniscientem, omnipotentem* expergefactus transeuntem a tergo vidi et obstupui! Legi aliquot ejus *vestigia* per creata rerum, in quibus omnibus, etiam in minimis et fere nullis, quæ vis! quanta Sapientia! quam inextricabilis perfectio! Observavi *animalia* inniti vegetabilibus, *vegetabilia* terrestribus, *terrestria* telluri; *tellurem* dein ordine concusso volvi circum Solem, a quo vitam mutuatur; *Solem* demum circa axin gyrari cum reliquis astris systema siderum, spatio et numero non definiendum, mediante motu in vacuo nihilo suspensum teneri ab incomprehensibili *Movente Primo, Caussa Caussarum, Custode Rectoreque universi mundani hujus operis, Domino et Artifici* . . . . . *Totus est* SENSUS, *totus* VISUS, *totus* AUDITUS, *totus* ANIMÆ, *totus* ANIMI, *totus* SUI, *hujus* EXTERA *indagare non capit humanæ conjectura mentis.*[1] NUMEN *esse credi par est, æternum, immensum, neque genitum neque creatum. Hoc sine quo nihil est, quod totum hoc fundavit et condidit, quodque oculos nostros et implet et effugit, cogitatione tantum visendum est, in sanctiore enim secessu Majestas tanta delituit, nec ulli dat aditum nisi animo.*"—Copied from the 12th ed. *Systema Naturæ* in possession of the Linnean Society.

[1] Exod. xx. 41.

Stability in Creation.

Science and Faith part company at the first verse of the first chapter of Genesis. Faith is an act of submission which science declines to yield. Science knows nothing, and can know nothing, of a "beginning." It is inconceivable to the mind of man, and the truth can only be received by faith, on the authority of Divine testimony. So we read (Heb. xi. 3) that it is "through faith we understand that the worlds were framed by the word of God, so that things which are seen were not made of things which do appear." Sound philosophy will take into account and examine this testimony, and will record its perfect harmony with what meets our observation.

The stability of the Creation is found in God himself. We have only recently begun to appreciate the stability which He has communicated to the ether, which is the medium of conveying the impressions of light. Of this we are assured, that it consists of created particles, which we call imponderable, because we have no means of weighing them; but its pressure must be prodigious, as is shown by its elasticity, of which the swift transmission of light is an indication, and through which the lightning-flash, in passing, produces the accompanying thunder which results, from a slight disturbance, and a local one, of this equilibrium.* The ethereal creation is, in the most eminent degree, *stable*, and has more the properties of a solid than of a liquid.

In the composition of the masses of inorganic matter which form the strong foundations of the earth we have *absolute stability*. I have shown sufficiently, in previous papers,† that this is the nature of the atoms themselves, and also of the molecules resulting from the balancing of the atoms in more or less elaborate systems, arranged according to never-changing laws. These attractions or repulsions operate with mathematical exactness between atom and atom, or between molecule and molecule, but no further. There is no consent of atoms to produce a certain effect; no central force organizing; no variability of structure, such as comes in with life, and pervades, more or less, all its manifestations. Such as the chemical relationships of matter now are, such they must have been

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* *L'Architecture du Monde des Atomes.* Gaudin, Paris, 1873, p. 5.

† See *Victoria Ins. Trans.*, 1873: "Scientific Facts and Christian Evidence." *Id.*, 1874: "The Contrast between Crystallization and Life."

through all time, and such, as far as can be traced, they exist to the furthest extremities of the universe.

The laws of chemical combination do not seem to be taken into account by those who would fain make life a manifestation of crystallizing action. A fresh proof of this meets me in the Address I have been considering. The Doctor speaks of "a double conical or spindle-shaped radial lineation of the protoplasm, which, if we were inclined to speculate as to its nature, seemed almost as if it marked out the lines of molecular force acting in the organizing process."

Molecular force acts only between atom and atom, and this speculation as to the lines of molecular force is as much at variance with all that we know of chemistry as is the notion of a spindle-shaped lineation resulting therefrom. All solid bodies are formed by the reunion of molecules placed together. These molecules are like each other in the same body, but different from those of another body. The result is, in bodies susceptible of crystallization, their arranging themselves in their own peculiar form; the crystals of sea salt, for instance, in the form of a cube, or some shape of which the cube is the basis, always in regular mathematical figures, although these may be obscured in manifestation.*

Fig. 1.

Transformation of the Cube into a regular octohedron. (Laurent, *Précis de la Cristallographie.*)

The *cube*, which is the very symbol of stability, may be taken as the expression of all inorganic nature. It is fixed, unchangeable, self-contained, reaches forth to nothing beyond, owns no organizing power. Such as it is, such and no other (as far as science can see) it must be to eternity.

Beauty in Creation.

With the introduction of life comes in a completely new order of things. The structure of chemical compounds is entirely submitted to mathematical law; whilst, on the contrary, in organization mathematical law has been avoided.† Every

* *Cristallographie*, Laurent, pp. 52–8, 25, &c.
† *Architecture du Monde des Atomes*, p. 3.

one will understand that, if he were presented with a drawing of a plant bounded by rectilinear outlines, or of an animal forming an exact cube, such professed likeness was an unnatural impossibility. Freedom of development comes in place of mathematical law, and with this freedom beauty and variety appear.

In order to attain these results (apparently), the spiral takes the place of the straight line. Even in the growth of the upright stem of a tree we may notice that spiral tendency, which is still more evident in the set of leaves on a plant, or in the arrangement of the parts in the cone of a fir. Cells with spiral cell-walls originate a vessel with spiral walls; these vessels twine in a certain direction and produce a spiral stem.* The stem itself may twine around another tree in a spiral manner; leaves, flowers, fruit, may be arranged in spirals of various orders. The shell of the nautilus is rolled up in a most graceful spiral; the heart of mammals is a double continuous spiral of exquisite beauty. The wings of birds, and the extremities of bipeds and quadrupeds, are distinctly spiral in their nature, and their movements are curved spiral movements; nay, more, the vertebral column itself is a spiral of very unusual but delightful curve. Dutrochet states that there is a revolving movement in the summits of stems,—a spiral rolling of the stems round their supports, a torsion of the stems upon themselves, and a spiral arrangement of leaves; all these being in each plant in the same direction. These phenomena, he avers, are owing to an *internal vital force*, which causes a revolution round the central axis of the stem. "The heart pulsates while yet a solid mass, and before it contains blood." † Thus we continually touch upon the verge of the *unknown*. The very plants that twine around our hedges present problems which pass all the boundaries of science. When we come to speak of voluntary motion (as in *Desmodium gyrans*), of what in animals would be termed instinct, of extraordinary sensibility to impressions in mere plants, amounting to their recoiling with disgust from some objects and attaching themselves to others, it is obvious

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* Pettigrew, *Physiology of the Circulation*, p. 17, *note*. A good illustration of *spiral cells* may be seen in Plate III. of my *Quinology of the East Indian Plantations*, a copy of which work I have presented to the Institute. In Plate II. may also be seen a drawing of the fibres of the liber, having a similar spiral formation, seen very beautifully under the microscope.

† *Id.*, p. 127.

that we are incapable of explaining *how* these things can be. We can only admire and adore.

Fig. 2.

Fig. 3.

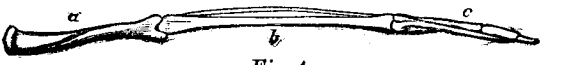

Fig. 4.

Fig. 2. Wax cast of the left ventricle (*b*) and portion of the right ventricle (*a*) of the heart of a deer. Shows the spiral nature of the left ventricular cavity,—the spiral courses or tracks of the masculi papillares (*x*, *y*), and how, between the masculi papillares, two spiral grooves (*j*, *q*) are found (they are spiral ridges in the cast), which conduct the blood to the segments of the mitral valve in spiral waves.

Fig. 3. Bones of the anterior extremity of the elephant. Shows the spiral arrangement of the bones of the fore leg. *q*, humerus; *x*, *q'*, radius and ulna; *o*, bones of foot.

Fig. 4. Bones of the wing of a bird. Shows their spiral arrangement. Compare figs. 2 and 3. The bones of the human arm resemble those of the fore-limb of the elephant and the wing of the bird. *a*, humerus. *b*, radius and ulna. *c*, bones of the hand.*

Creation everywhere discloses to us Beauty. *Harmony, grace,* and *proportion* are always present, introduced for their own sakes, or rather to show forth the glory, and to meet the Infinite Mind of the great Architect of all.

Our grand old mediæval builders seem to have entered into the spirit of the display of God's glory in the visible world, and to have adopted in our cathedrals these two great principles of Stability and Beauty. We have *stability* where it is needed, and that secured, as well as by the masses of Stonehenge; but we have all the delightful variety in ornamentation, ever refreshing the eye with forms given to man for his admiration. In the vast and mysterious relics of the Pagan

* These illustrations are from Pettigrew's *Physiology of the Circulation in Plants, in the Lower Animals, and in Man,* and are inserted here by kind permission.

religion of the earlier inhabitants of these isles, we have stability indeed, but no beauty. Stonehenge, and the kindred structures of Peru, described by Squiers,* were devoted to a worship, solemn, indeed, and mysterious, but in which terror took the place of love.

"Pavet ipse sacerdos
Accessus : dominumque timet deprendere luci." †

It was impossible that heathenism, in any of its forms, should enter with real sympathy into the refined perception of beauty displayed in the works of creation. Only in Greece does there seem to have existed the conception that there was something divine in the beauty of the human form.

In this respect their philosophy rather than their religion antedated somewhat the influence of Christian ideas. There is now no Christian mind that cannot understand the formation of all creatures as leading up to man, so that he is the keystone of the mighty design towards which all converges, and in which all things centre. (See Hebrews ii.)

Man is the visible king, and in all the details of his structure we easily discern the mark of inbred royalty.

"Os homini sublime dedit, cœlumque tueri,
Docuit, et erectos ad sidera tollere vultus."—*Ovid.*

Dominion and power, and moral and intellectual grace, are designedly expressed in the whole of man's formation, so that I take nothing short of *the person of man* as the conception of what I understand by organic nature; instead of the cube by which I symbolize the inorganic, or what we may call brute matter. To confound the divine prerogatives of man with those of the beast is a reversal of the whole scheme of Creation. It is a high crime of *lèse majesté* against the dignity of man, and an impeachment of the wisdom and goodness of his Creator.

Man is the expression of the *majesty*, woman of the *beauty* of Creation.

The perception of beauty in Creation is the reflection of an attribute of the Infinite Mind, and, like the perception of harmony, is intuitive, belonging to man in his original perfection, but now very variously shared by individuals of the human family. But if this last statement be admitted, much less ought we to extend to the lower animals these æsthetic tastes. Can we suppose any sense of abstract beauty to influence the mental

* Squiers' *Peru*, 1877, p. 384, &c.
† Lucan, *Pharsalia*, lib. iii. 424, 425.

emotions of the swine? or have we any reason to think more highly of the taste of a peahen? If we attentively watch the actions of these latter, even in the season when the male's plumage is most attractive, we shall easily perceive that a small piece of biscuit outweighs in her predilections all the gorgeous spectacle that nature has given her in her liege lord; to whom her fidelity is only assured by superior strength and masculine vigour; and however great the beauty she relinquishes, she quits it all apparently without regret if a stronger rival drives her mate from the field, and appropriates her for his own. There is no stability in her affection. The peacock, on his part, evidently appreciates the qualities of his mate, and relies on his strength, and not on his attractions, driving her before him with a masterfulness which is amusing to behold. *Il se pavonne* (if I may be allowed to use an untranslatable French expression) for his own amusement, and not for her delight. The thrill of pleasure accompanying the expansion of his tail is in no way dependent on her stolid regard; nor do I believe that the range of her visual organs is sufficient to take in at once, as we do, the superb spectacle. Certainly the propagation of the race would have gone on just as well if the male had been as plain in his plumage as the female; as we may see in the sparrows, those birds almost proverbial for their powers of multiplication.

What, then, becomes of the theory of "sexual selection" in reference to beauty? It presupposes æsthetic tastes which we have no right to suppose to exist, and it is not sustained by observation of the actions of the human race, in whom these sentiments do certainly exist.

Nevertheless, it is matter of common observation that these do not absolutely dominate the preferences of either sex. Those who do not read human nature, may, if they read *Hamlet*, easily unravel this.

"Look here, upon this picture and on this."

It is notorious that in the animal creation, rank, and to us often repulsive, odours, are more attractive than all the beauty of Paradise.

It is not to be supposed that those who advocate a mechanical and self-evolving universe should have any delight in the beauty of Creation, or see any object in its existence. To them it might as well be bounded by straight lines, and dressed in universal drab.

It is otherwise with men of finer minds and of more just perceptions. Foremost amongst these, Ruskin thus contrasts organic and inorganic nature; and I shall quote the passage

as a good prelude to what I have hereafter to say. This writer, in an admirable chapter on the leaf, says: "This peculiar character exists in all the structures thus developed, that they are always visibly the result of a volition on the part of the leaf meeting an external force or fate to which it is never passively subjected. Upon it, as on a mineral in the course of formation, the great merciless influences of the universe and the oppressive powers of minor things immediately near it, act continually. Heat and cold, gravity and other attractions, windy pressure or local and unhealthy restraint, must in certain inevitable degrees affect the whole of its life. But it is *life* which they affect—a life of progress and will, not a merely passive accumulation of substance. This may be seen by a single glance. The mineral, suppose an agate in the course of formation, shows in every line nothing but a dead submission to surrounding force. Flowing or congealing, its substance is here repelled, there attracted, unresistingly to its place, and its languid sinuosities follow the clefts of the rock that contains them in servile deflexion and compulsory cohesion, impotently calculable and cold. But the leaf, full of fears and affections, shrinks and seeks as it obeys. Not thrust, but awed into its retiring; not dragged, but won to its advance; not bent aside as by a bridle into new courses of growth, but persuaded and converted through tender continuance of voluntary change."*

Ruskin concludes his remarkable review of the building up of trees thus: "The beauty of these buildings of the leaves consists from the first slip of it to the last in its showing their perfect fellowship, and a single aim uniting them under circumstances of various distress, trial, and pleasure; without the fellowship, no beauty; without trouble and death, no beauty; without individual pleasure, freedom, and caprice, so far as may be consistent with the universal good, no beauty . . . So soon as there is life at all there are these four conditions of it —harmony, obedience, distress, and delightsome inequality."†

The above language may seem too figurative, but it expresses realities in nature the explanation of which has to be sought; as for example, the mode in which light attracts vegetation, of which the sunflower furnishes a familiar illustration.

The goodly wings of the peacock, and the feathers of the stork and of the ostrich, are spoken of in Scripture as the preeminent glory of the Divine Creator.‡ We have thus a satisfactory reason for their existence, and an indication that man,

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* *Modern Painters*, vol. v. p. 33. † *Ibid.*, vol. v. p. 76.

‡ Job xxxix. 13.

in admiring them and giving the suited praise for their existence, is performing in so far his right part in nature.

Christ has said, "Consider the lilies, how they grow; they toil not, they spin not, and yet I say unto you, that Solomon in all his glory was not arrayed like one of these."

Harmony in Nature.

"The man that hath no music in himself" is set down by our great poet as very low in the scale of humanity. "Let no such man be trusted."* No doubt there is truth in this estimate, founded on a keen though rather shrewd observation of mankind. A deficiency in these finer perceptions is in so far a loss of the original dignity of man's nature, and places the individual more out of fellowship with the works of God. It is of little use pointing out to such the testimony which the general harmony of nature bears to its being the result of one Mind, and that one Mind the source of all beauty.

One aspect of this general truth was pointed out to me first by my late friend Berthold Seemann, who refers to the subject in his "Historical Notice" prefixed to the *Flora Vitiensis*.† He describes the banks of the rivers and rivulets in the islands of Fiji as densely crowded with vegetation, amongst which are found several species peculiar to these localities, all of which would have to be classed physiognomically with Humboldt's "willow form," a set of plants which, unaffected by the occasional rising and turbulence of the streams, not only have the same kind of foliage, habit, and mode of growth as genuine willows, but evidently serve the same purpose in Nature's economy,—that of protecting and keeping together the river banks, though they are not related to the genus salix. One of these is indeed a fig (see Plate LXVII.). Seemann says:—

"The frequency of plants belonging to the willow form on river banks in all countries of the world appears to have been dealt with first by Humboldt in his *Ansichten der Natur*. These outer resemblances between different species which have no organic relationship have played us botanists many a trick, and have been the cause of some otherwise incomprehensible synonyms in our systematic works by really good botanists relying too implicitly upon them—resemblances to which the term 'mimicry in nature' has been applied. I have objected to this term, because in applying it, either in zoology or in botany, the whole question here cropping up is prejudged, it being assumed that (1) organisms have the power to mimic

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* *Merchant of Venice.*

† *Flora Vitiensis*, p. xiv.

other organisms, and (2) that they have come in contact with those organisms which they are supposed to resemble." *

Dr. Seemann was no evolutionist, and I the more lament his loss. This being the case, his observations may be dismissed as unworthy of attention by the class of minds I have referred to, but must, I think, be considered conclusive by those capable of understanding the force of sound argument.

Moreover, the resemblance is sometimes such as immediately to strike our fancy, but to be of no possible advantage to the plant or animal. It is sufficient to point to two plants under my own observation, the butterfly orchis and the bird-headed aristolochia, as illustrations of this. I have before me a leaf-insect, which I received in a live state, green and fresh, but which now represents sufficiently the *faded* leaf. But this is not all. The egg from which the creature originated (and of which I have also a specimen) is so wrapped up in its integument as perfectly to resemble a *seed*, carrying out thus the *mimicry* to its full extent.

Harmony and what is called "mimicry in Nature" are not to be reconciled with Darwinism.

Soul in Organized Nature.

My attention was first called to the subject of the unfolding of apparent intelligence in Nature when, as a youth, I amused myself with cultivating plants in my father's conservatory. Especially the production of adventitious roots † called my thoughts to the fact of some apparent power in Nature to meet emergencies; as in the case of a particular plant from the Cape, to provide against the fall of a tall stem by stays on every side—an arrangement which is much more strikingly seen in some trees, as in the palm of the Sechelles, in which they resemble the shrouds of a ship, and are indispensable to guard against the influence of the fearful hurricanes often sweeping over those islands.

The subject has at times occupied my thoughts ever since, and I still wait for the explanation. If I see my way at all towards a solution of the real mystery of Nature, it must follow that the mechanical-universe-mongers have entirely missed their way, and have not so much as lifted a corner of the veil of the mighty mother.‡

It is only of late that we have ascertained that *matter* is not the only *materia* used in building up the universe, for we have

* *Gardeners' Chronicle*, June 27, 1868. *Journal of Botany*, p. 213. 1868.

† See an example of these in plate, *Crystallisation and Life*, p. 27.

‡ See Plutarch's *De Isid. et Os.*, page 28: Inscription in front of the temple of Isis.

only proceeded so far in the demonstration of the existence of the luminiferous ether as to say that we know intellectually that such a thing *must* be, that it is all around us and within us; but we are not cognizant of its varied properties. It is quite a logical deduction to suppose that we here stand on the verge of a mighty ocean of unfathomed existence, and that we need a Columbus to explore its depths.

Without presuming to spread our sails for this venture, we shall, I hope, be able to agree in this statement, that there is *soul* (ψυχή, anima) in all organized Nature, and that it is this which distinguishes organized existence from inorganic matter. It is not only manifest in the original construction of the individual, but presides over its future destinies, enabling the young of each species to act according to its special destination.

To obviate misconception, I must remark that I am here propounding no new doctrine, but one which is distinctly stated in Genesis, recognized throughout the law of Moses, and common also to the whole ancient world. The words *nephesh*, *psyche*, and *soul* are used with considerable latitude of meaning. The expression *nephesh* may be well studied in the Lexicon of Gesenius. On the whole, the words *animal life* may be found to convey the meaning in the least objectionable way, but yet not with entire accuracy; since affections and various emotions are ascribed to it which we are accustomed to speak of as belonging rather to the mind.

The seat of this vital principle is considered to be the blood, and that when the blood is poured forth the soul is poured forth with it. "To blood is ascribed in Scripture the mysterious sacredness which belongs to life, and God reserves it to Himself when allowing man the dominion over and the use of the lower animals for food. Thus reserved it acquires a double power—(1) that of sacrificial atonement, in which it had a wide recognition in the heathen world, and (2) that of becoming a curse when wantonly shed, *e.g.*, even that of beast or fowl by the huntsman, unless duly expiated, for example, by burial."*

The organizing principle in the vegetable creation is not called "soul," but must have some analogy to it, since we find in some plants both sensation and automatic movements in a rudimentary state. It may be a different manifestation of ethereal substance, of which there may be numberless modifications; and of which the animal life in man must be the highest type, and may be the seat of those instincts which he

* *Dictionary of the Bible, sub voce* "Blood."—Rev. H. Hayman, B.D. Refer. Gen. ix. 4; Lev. vii. 26; xvii. 11, 13.

shares with the lower animals. With these he has sufficient relationship to enforce upon him the law of kindness—the avoidance of the infliction of unnecessary pain, and of that love of cruelty which marks the worst type of humanity.

Burns, in his admirable "Address to a Field Mouse, on turning her up in her nest with the plough, Nov., 1785," shows how these things strike a noble and generous mind:—

"I'm truly sorry man's dominion
Has broken Nature's social union,
An' justifies that ill opinion
Which makes thee startle
At me, thy poor earth-born companion
An' fellow mortal," &c.

Man's Place in Creation.

For those who reject the teaching of Scripture, there is no common ground on which believers in its authority can discuss the questions on which we now enter. Those who receive it have an inestimable advantage in securing a distinct standpoint from whence they may proceed to investigate (as far as may be) the nature of which they are partakers; and which they find by experience differs so widely from that of brutes.

This distinction is specially, and above all things, to be traced in the *pneumatic* nature of man. In the *animal* and *psychical* nature, he has much in common with the lower orders of creation, but he stands entirely alone in the highest, and therefore the most characteristic attribute of his nature. He is not only a separate species, but he must have required a separate act of creation, placing him at an infinite distance above the rest of the works of God.

According to the book of Genesis,* Elohim created Adam ("the human race," את האדם) in His image, in the image of Elohim created He him, male and female created He them. And Elohim blessed them, and Elohim said unto them, "Be fruitful and multiply, and replenish the earth and subdue it, and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth."

According to Jewish commentators,—"When organized nature is called into existence, the words used are, 'let the earth shoot forth,' 'let the waters teem,' 'let the earth bring forth'; but when man, an intellectual being, composed of spirit as well as matter, is to be created, it is no longer earth or water which are directed to bring forth; but the concentration of all powers, Elohim, exclaims, *We will make man.*"†

* Gen. i. 27.

† De Sola, *Genesis*, p. 4.

Our Christian commentators may differ in measure, but will not detract from the grandeur of this distinction. God chose to create man, alone among all creatures of the earth capable of the knowledge of Himself. He therefore gave him not only a *psychical*, but a *pneumatic* nature. He formed his body indeed of the dust of the earth, that is to say, of the materials of this visible and tangible world, but he superadded something of His own special bestowment. He breathed into his nostrils the breath of *lives*, חיים and man became a living soul.

The living soul life נפש חיה he shares in common with "every beast of the earth, and every fowl of the air, and every thing that creepeth upon the earth wherein there is *living soul*";* but taking into consideration the speciality of the act, and the plurality of the result "lives," and not simply one life, we are fully justified in the above conclusions.

In reference to the inferior creation, all is described as the simple embodying of *ideas*, previously existing in the Divine mind, or perhaps I should rather say in the Logos or personal Word Himself—"Jehovah Elohim made every plant of the field before it was in the earth, and every herb of the field before it grew."†

Παντοίαις ἰδέαις κεχαρισμένος, ὧν μία πηγή.

Beautified with all kinds of ideas of which there is one fountain.‡

These are all transitory; they may pass away, and the very type itself be forgotten until it be resuscitated through the researches of the palæontologist, bringing to light the wonders of a past age.

But the Scripture declares it is not so with man, for the Eternal One (Jehovah) declared to Moses, "I am the God of Abraham, and the God of Isaac, and the God of Jacob. God is not the God of the dead, but of the living, for all live unto Him."§ If they live unto Him, they live according to His eternal life. His name, I AM, secures unto them an eternal NOW in His blissful presence.‖

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* Gen. i. 30. † Gen. ii. 5.

‡ Cory's *Ancient Fragments*, p. 106.

§ Matt. xxii. 32; Mark xii. 27; Luke xx. 38.

‖ Well given by Watts as follows:—

1 His boundless years can ne'er decrease,
But still maintain their prime;
Eternity's His dwelling place,
And *Ever* is His time.

2 While like a tide our minutes flow
The present and the past;
He fills His own immortal *Now*,
And sees our ages waste.

Man has, in common with the lower animals, the *psyche* or animal soul, which in them, as in him, is intimately connected with the blood, and seems to possess the brain as its special organ of thought—thought which, to a certain extent, is shared by the lower animals, as, on the other hand, he shares in measure their instincts.

But in the *pneuma* he stands solitary and alone. He can find no helpmeet amongst the lower animals to satisfy his *pneumatic* nature. He is formed for God, and is restless till he finds rest in Him. He is the crowning work of the great Artificer, introduced last, as the link uniting the whole Cosmos with its Creator—made so far in the likeness of God as to seem to share in some measure His attributes. He is so great in his powers as to be somewhat less than Almighty, but yet so exalted as to be in reference to the lower creatures a kind of visible god upon earth.

"What a piece of work is a man! How noble in reason! How infinite in faculties! in form and moving how express and admirable! in action how like an angel! in apprehension how like a god! the beauty of the world! the paragon of animals!"*

Can such a creature be the mere "*quintessence of dust*"?

Such and so great and so important a being cannot be a chance congeries of atoms. That Providence of the Almighty mind which cares for all creatures, must certainly be extended over man. His individual place in creation must be assigned by the fiat of his Judge, and his actions in this assigned sphere must be the object of special interest to that Being before whom not one of five little nestlings is forgotten.

In order to understand the mystery of the continuation of the species and the consequent introduction of each individual into its appointed place in creation, we must first have a clear notion of the species itself. As regards man, we have considered him as possessed of a threefold nature—"body, soul, and spirit." Concerning the body we know that it is connected with, or even fabricated out of, the chemical elements of which we have cognizance by science. Concerning the *soul* we know nothing of the kind, and concerning the *spirit* still less. We are assured of the reality by philosophy rather than by science of ethereal existence, and we have reason to believe that we here touch only the boundary of a vast unknown.

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* *Hamlet*, act ii.

Vast, certainly, for who can calculate the extent of that which must pervade everything, and reach to the remotest star. Unknown also, for we do not know what intimate relationship this may have with those essences of soul and spirit of which we ourselves consist; of which relations we are sometimes unpleasantly reminded in the changes of electric states.

It is life, and organization, and what we call "mind" that is the real mystery, rather than the continuation of these things in succeeding generations.

To illustrate what I mean from the vegetable creation, let us take a sprig from a sensitive plant, another from an herb exhibiting automatic movements, another from a tree having powerful effects on the animal economy. Allow these to grow, and we shall see them each develop the qualities of the original plant. Why? because of some difference in the oxygen, hydrogen, carbon, or nitrogen, of which they are shown by analysis *alike* to consist? Certainly not, for the most searching analysis can find no difference; but *something* has escaped us, and this the most important of all.

Of this "*something*" we know that it is essential to the organization, and yet that it does not reside in the chemical atoms of the organized body itself. It is not a cell nor a nucleus, nor anything else which we can define; neither is it dependent on circumstances.

> "Atque hâc re nequeunt ex omnibus omnia gigni
> Quod certis in rebus inest secreta facultas."*

The "*secreta facultas*" on which all this depends remains as unexplained as it was in the days of Lucretius.

These essentiæ may be so far combined as to follow the same lines of growth, and yet so far separate as to come out individually in their full and manifest distinctness.

Thus, in the *Cytisus Adami*, which was formed by a gardener who gave his name to the compound plant, different varieties of Cytisus are fused together. I have seen an old tree in a garden at Highgate which grew alternately or indifferently branches of three kinds of Cytisus—the kinds retaining all their peculiarity, both in the branching and inflorescence.

The reversion of one single branch in a tree, such as the fern-leaved beech, to the primitive and widely-differing normal

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* Lucretius *de Rerum Naturâ*, lib. i. 173—175.

type, is a perplexing fact, baffling our powers of investigation. A similar remark may be made, in reference to a passage (page 90) in the recently-published work of Mr. Darwin, on the different forms of flowers. He says, "We plainly see that the two kinds of pollen and the two stigmas are widely dissimilar in their mutual reaction, the stigmas of each form being almost powerless on their own pollen, but causing, through some *mysterious* influence, apparently by simple contact (for I could detect no viscid secretion), the pollen-grains of the opposite form to protrude their tubes. It may be said that the two pollens and the two stigmas *mutually recognize each other* by some means." (The italics are mine.)

Here then are *mysteries* surpassing fable connected with the ordinary *life* of our common flowers,* and for the explanation of which no merely mechanical or merely chemical theory has ever been attempted to be offered.

Alike mysterious does it seem to me that the essential nature should be changed, as in hybrids, where we find the different forms not flowing together without mixing, as in the *Cytisus Adami,* but really united. The phenomena of the crossing of plants exhibit this intimate mixture. I will take an instance which I have myself examined. A cross between two species of Cinchona was produced in Java. I have described it as the Calisaya Anglica. In this case the fusion operated by the interference of the pollen between the two species, was strikingly complete in several respects of form, colour, &c., but most so, in a point of intimate organization, which we seldom have so good an opportunity of investigating.

Both the parents possessed specialities in the production of alkaloids, the cells of one elaborating Quinine, the other Cinchonine. When hybridized, the product was a mixture of the two. I suppose, therefore, that the chemical properties of *every cell* were altered by the interference of the pollen and the consequent cross fertilization. The supposition of an alternation of cells of different productive powers seems less probable.

The products derived from the crossing of animals are much more remarkable, especially in reference to the transference of the *vis insita,* and not only the corporeal characteristics, but also the dispositions and the mental characteristics of the parents.

The President of the British Association says, that, in the

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* Compare the works of the elder Darwin.

statement which he has made, "of some of the more remarkable phenomena of organic production," it has been his object "mainly to show that they are all more or less closely related together by a chain of similarity of a very marked and unmistakable character; that, in their simplest forms, they are indeed, in so far as our powers of observation enable us to know them, identical; that, in the lower grades of animal and vegetable life, they are so similar, as to pass by insensible gradations into each other; and that, in the higher forms, while they diverge most widely in some of their aspects in the bodies belonging to the two great kingdoms of organic nature, and in the larger groups distinguishable within each of them, yet it is still possible, from the fundamental similarity of the phenomena, to trace in the transitional forms of all their varieties, one great general plan of organization."

His address aims at the advocacy of the doctrines of evolution, as alone suited to explain "the continuous series of gradations, as well as the consistent and general plan of organization." This, the President considers, "*must* have been the result of a gradual process of development, or of derivation one from another." But if, as I have shown before, Creation is looked upon as the result of the plan of one Almighty mind, the Logos or Word of God, we are at once furnished with the explanation of the general harmony, in the same sense as in criticism we can discern a unity of design and a recurrence of type in the works of any great poet, painter, or architect. We learn almost certainly to distinguish any peculiar style, not because one line is the *father* of another, but because the same formative mind models the whole. The general relations of the groups of metals and the arrangement of the elements in nature, are as remarkable instances of the ἀρχιτεχτονικὴ φρόνησις of the Logos, as the relations of animated beings; and, in this case, there can be no possible question of "*evolution*" or "derivation one from another."

The whole doctrine expounded in the address to which I have alluded is based upon the following statement:—"The germ constituting the basis of a new formation, whether it have the form of spore, seed, or ovum, is of the simplest kind of organization; and the process by which a new plant or animal is produced is necessarily one of gradual change and of advance from a simpler to a more complex form and structure; it is one of evolution, or, as I would rather name it, development."

This appears to me to be a misconception of the whole

subject, and the statement of that which is obviously incorrect. It is *life* that is the real mystery, and the continuation of this life may be effected in various ways. Some of these in the higher parts of creation are wonderful enough, but others so simple as to be seen under the microscope as "a process of cleavage or direct and visible division of the parent body."

Now, in the process of cleavage there is really no parent and no offspring; but one life becomes two lives by a process of division which goes forward under the eye of the observer; as if the entity were divided by the stricture of some invisible cincture pressing *from without*. In other cases the new entities are formed within the parental body, and take its place by multiplication rather than by division. In the vegetable kingdom, as is well known, individuals may be propagated to an indefinite extent by *cuttings;* which are quite analogous to the former mode; or by buds or bulbs, which fall of themselves and produce new plants, which is analogous to the second mode. When we come to reproduction by seeds in the vegetable tribe, we first meet with anything like the "advance from a simple to a more complex form." We have, in fact, the result of a *duality* destined to further development in the higher ranks of Creation; though existing in so rudimentary a character in the algæ and fungi, as to allow Dr. Thomson (strangely enough) to argue for an absence of specialization. But if the fusion of two masses of protoplasm is needful to the production of a new individual, it must be evident that there *is* a difference, though we may not be able to distinguish between the two.

This *duality* is, at last, exalted into sexuality, and the union of two sexes becomes ordinarily necessary for the continuance of the species; *ordinarily* but not *absolutely*, because we meet with the phenomenon of *parthenogenesis*, as in the *aphides*, which are capable of reproducing to the extent of many generations until the approach of winter renders it expedient that males should be formed.*

Gen. ii. represents not a new creation, but the "building" of the woman out of the man. It is the same nature, but moulded into harmony with a different organization—differently perfect, and yet perfectly different; so that the separate place of woman in Creation is not that of an inferior Adam, but that of Eve, the living one, rejoicing in maternity.

This difference of organization, and consequently of tastes

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* For further particulars and details see Appendix C.

and pursuits, manifests itself as soon as the little ladies in a family become occupied with their dolls, and the romping young gentleman with his much-abused horse; showing us how intimately organization is connected with the whole being. All this, though faintly indicated at first, we must remember is carried to mature perfection by some unseen force involving the whole being in its influence.

What, then, are we to think about the transmission of this organization in the continuance of the species? Are we to rest satisfied with the *sesquipedalia verba* of science,* or may we not rather exercise our common sense and common habits of observation, and see what they teach us?

> "Fortes creantur fortibus et bonis:
> Est in juvencis, est in equis patrum
> Virtus; nec imbellem feroces
> Progenerant aquilæ columbam."
>
> *Horace*, Od. iv. 4.

We know that *like* produces *like*, and if the scientists can find no difference in the incipient beings, we must impute this to their deficient power of observation. The difference is and must be there from the commencement; it is not something superadded by evolution.

The variety in organization imprinted as above by the hand of the Creator carries with it, as we have seen, an entire differentiation of the whole being as to what we call mental and moral characteristics. To suppose that the feminine mind is the same as the masculine, is to evince a misapprehension of the whole subject—not unfrequently fatal in its results when it is supposed that it can bear equal strain with that endured without suffering by the stronger sex.

In order to realize the importance of organization let us suppose that the continuance of the species had been ordained to be by *parthenogenesis*, as among the aphides; we should then have had a world absolutely without variety, through the exact reproduction in every particular of the original type.

But in the world as now ordered we have the greatest variety of the *manifold* consistent with typical *unity*.

Thus, where *duality* is introduced, whether in the vegetable or animal creation, we find at once a tendency towards this *manifoldness* in creation.

In this continuation of the species by duality (or sexual

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* For criticism of anatomical details see Appendix D.

propagation), each parent gives one half of the resulting being.*

Another source of variety is the dissimilarity of *race* amongst mankind. This is as great as can be deemed consistent with a common origin, and once markedly impressed seems to be almost imperishable. The resemblance of ancient types to their modern representatives has been abundantly illustrated by Cuvier and those who have succeeded him. I do not see how this differentiation can have been caused by external circumstances, as it penetrates so deeply into the physical structure. A white man will become dark-coloured by exposure to an African sun, but he would never acquire the peculiarities of a negro, and the descendants of white parents would perish from the torrid zone long before they could have acquired the peculiar skin and the specialities of organization suitable to such a climate.

Moreover, we find a vast variety of strongly-marked types amongst such a population as inhabit the British Isles, and there is, perhaps, no family of persons that can trace back their pedigree for many generations who must not be constrained to admit that some prevalent features of disposition or of mental constitution have been manifest in them from one generation to another.

This indestructibility of organization appears to me to be irreconcilable with the notions of evolution. The phenomenon of atavism, or recurrence to type, deserves especial study in this connection.

In fact, if there is anything which must strike an observer in the organized world it is the order and the constancy which we see reigning for ages. The cause of all this is simple and unique. If we could suppress infecundity between the species—suppose that the unions between wild species were in all senses and indefinitely fruitful, as they are among our doves and in our stables, what would happen? The barriers between species, between genera, would be taken away. Crossing would take place in all directions; everywhere would appear intermediate types; everywhere the actual distinctions would gradually become effaced and disappear. It is impossible to imagine where the confusion would stay its course. It would become a chaos of misformed creatures, such as the Babylonians dreamt of, and such as Lucretius described.

"Infecundity between species in the organic world has consequently as important a part as the force of gravity in the celestial world. It maintains

* See Appendix E.

the zoological or botanical distance between species, as the latter maintains the physical distance between the heavenly bodies. All these have their perturbations, their unexplained phenomena. Do we on account of these doubt the great laws which hold in their place the smallest of the satellites as well as the largest of the suns? By no means. Can we on similar grounds deny the fact which secures the separation of the species nearest to each other as well as of the most distant groups? No more than in the previous case. In astronomy we should discard at once every hypothesis in opposition to the first, and although the complication of phenomena is much greater in botany and in zoology, a serious consideration of the subject will always lead to the rejection of every doctrine that is discordant with the second.

"Human art may produce results which seem at first not to yield to rules of hybridation. It has done so once, and may do so again. For all that, it has not changed the natural and general law, nor has it demonstrated that it is non-existent."—Quatrefage's *Etude sur le Transformisme*, Paris, 1870.

The same observations apply to past geological ages as well as to the present. All things being alike in other respects, fossil species are as well defined and as distinct as those of the present era.

Everything leads us to the conclusion that the laws of the organic world have not changed since the beginning. To admit the contrary is to oppose to all that we know concerning the present and the past of our globe, the possible, the unknown; or, in other words, hypothesis, having for its foundation our very ignorance.†

The study of Dr. Thomson's Address has unexpectedly revealed to me the weakness of the case of the Evolutionists in this, which I had supposed to be their chosen battle-ground—the more so as I find, from the President's own admission, that the recently deceased Von Baer refused to give his assent to the doctrines of evolution.

"Although Von Baer's researches, according to the light in which we may now view them, contributed in no small degree to the introduction of the newer views of the morphological relations of organic structure which have culminated in the theory of descent, yet he was unwilling to adopt the views of Darwin, and one of his latest writings, completed in the last year of his life, was in vigorous opposition to that doctrine."

So far, I quote from Dr. Thomson. I now turn for further information to a paper by G. Moquin-Tandon, "De quelques Applications de l'Embryologie à la Classification méthodique des Animaux."* This able writer traces out the "Idée mère

* *Annales des Sciences Naturelles: Zoologie*, 1874-5.
† See Appendix F.

de cette fameuse théorie de l'évolution," which, he tells us, had produced more than three hundred hypotheses. He then passes on to more modern discoveries and hypotheses, and to the memorable researches of Pander and De Baer, the latter of whom, in describing for the first time the egg of the mammifers, in proving the existence of the ovarian cellule amongst all animals, impressed an entirely new aspect on embryology. And yet De Baer (if the same with Von Baer, as I suppose) was, as we see, no Evolutionist.

Agassiz (who also refused the fashionable doctrine) asserted that the discoveries of De Baer were the most beautiful that have been made in the natural sciences in modern times.

But the German "hyperDarwinist," Haeckel, comes forward with a new theory, according to which "the theory of types of Cuvier and of De Baer, which, during half a century and to our days, has formed the base of the zoological system, has become untenable * through the progress of *ontogenie*, and must yield to that phylogenetic classification of the animal kingdom of which the theory of the *Gastræa* forms the essential basis."

This promising young theory was to have demonstrated that all the different branches of the animal kingdom descend from only one unknown ancestral form, which *developed itself by spontaneous generation*, of which the organization was essentially the same as that of the *gastrula*. It is this form, long since extinct, which lived during the Laurentian period, and which M. Haeckel described under the name of *Gastræa*.

The very complete analysis of this theory by Moquin-Tandon leads to certain conclusions, of which it is sufficient for me to quote as epitaph:—

"The hypothesis of the *Gastræa* as the ancestral form common to all animals with the exception of the Protozoa, rests on NO FUNDAMENTAL FACT, and cannot serve as a basis for a phylogenetic classification." This theory was concocted in Germany; it is defunct in France, and entombed in the "Annales" from which I quote, but will probably be galvanized into life in England, as the place of its birth will give it to some minds an imperishable charm. It constitutes the basis of a not inconsiderable section of Dr. Thomson's Address, and though he has the modesty to acknowledge that the *Gastræa* theory is not quite proven, he leaves us under the impression that it is a most promising tentative experiment, so that "we are at least *in the track*

* *l. c.*, p. 14.

which may lead to a consistent view of the relations subsisting between the ontogenetic, or individual, and the phylogenetic, or race history of the formation of animals and of man."

Haeckel is, of course, canonized by the President as "one of the ablest and keenest supporters of the modern doctrine." As to Moquin-Tandon, he is a Frenchman, and not an evolutionist, so that his refutation is not even alluded to!

From the obituary notice of the celebrated Agassiz, published in the Proceedings of the Royal Society,* I learn that his *Essay on Classification* was his crowning work. "The erudition displayed in this work is remarkable, and the grasp of facts, intricate and numerous in their relations, is quite amazing. In nothing is this better exhibited than in his celebrated demonstration of embryological, geological, and zoological succession."

And with all this profound knowledge of the subject, "*Agassiz was much opposed to the theories of Darwin.*" At the time of his death he was engaged in the discussion of the "Evolution of Types."

With such leaders as Von Baer and Agassiz, we who know nothing of anatomy may safely rest content; declining to partake in the unsettlement of mind as to the doctrines of Creation which it seems the special object of some very inferior scientists to effect. The labours of these latter will no doubt be welcomed by many on account of their tendency; but, on the other hand, will be ultimately appreciated at their real value by those who adhere to the faith of their fathers. The present state of English science, *itself being judge,* is not so flourishing that it can lightly invoke the ostracism of all right-minded persons. The British Association has to renew a slightly fading reputation, and to convince the world that it meets for some nobler purpose than is aimed at by its President's Address.

Conclusion.

The believer in revelation is provided with a cause for phenomena, which, when once admitted, will explain all difficulties. The world-old belief in the Being and Existence of God as the Great Cause and End of all creation, and as the Sustainer of all that He has created, supplies a key that will fit all the wards of the lock. On the other hand, the advocates of materialism must not plead that they are honest in searching

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* *Proceedings of the Royal Society,* vol. xxv., No. 176.

after truth, and that they alone are capable of impartial investigation.

An "Inaugural Address" * has been courteously sent me by the author, from which I extract the following sentence:—

"The thought of the continual presence of God is also, as in the small affairs of life, too heavy for man to bear, and troubles his intellect even in special scientific investigations."

The desire *to get rid of the thought of the continual presence of God* thus furnishes a most powerful motive to view things in a certain light, and to represent this view of things as established science, disregarding all proof to the contrary. So I read in a paper in the *Quarterly Journal of Science* for October, 1877, as follows:—"We have no longer at the present day to concern ourselves with establishing the Evolution hypothesis. Almost all those who are in a position to form a judgment are agreed in accepting it." (!)

This will also account for the zeal displayed in the dissemination of these doctrines amid the masses of the people under the venerated name of Science. Amongst these persons there are always to be found a more than sufficient number, who, for their own reasons, will applaud any teacher that will help them to get rid of the idea of the presence of God. Such Professors will no doubt be rewarded by the popularity at which they aim.

Science itself, thus misused, suffers in her turn. I read in the *Quarterly Journal of Science*:—

"An opinion is rapidly gaining ground that the present scientific position of Britain is unsatisfactory, both as compared with that of certain foreign nations and with our own antecedents, and is consistent neither with the honour nor the true interests of the Empire." †

The review proceeds to show, that "in *speculative philosophy* we have reconquered the foremost place"; but "what we complain of then relates not to the height of our *scientific ideas*, but to the quantity of our *scientific work*, and the number of our earnest and scientific workers. . . . . Let us look at our scientific literature. It is exceedingly rich in the mere number of books published, but what an overwhelming portion of them, as every reviewer knows to his sorrow, are mere compilations, elementary treatises, and the like, well-

* "Is Scientific Materialism compatible with Dogmatic Theology?" The inaugural address delivered before the Literary and Philosophical Society of Liverpool, 14th October, 1877, by John Drysdale, M.D.

† *Quarterly Journal of Science*, p. 467, Oct. 1876.

known matter brought forward again and again, in a slightly modified form. How many of the original works even are *original in little save absurdity*, and consist in wild *attempts to subvert the whole existing system of our knowledge, and rebuild it as if by magic.*" (!)

The conclusion to which I am brought by a careful review of the whole subject is that, as regards man and his place in Nature, science has no basis at her command on which to rear any solid and substantial truth. She can only look at the outside of things, and judge by the evidence of the senses. Where this evidence fails her, she may resort to *guesses at truth*, but in so doing, abandons her own proper line of inductive reasoning from proved and acknowledged facts, and substitutes the perilous efforts of philosophy. *Perilous* certainly, because a strong *à priori* bias on such subjects is unavoidable, and the love of truth, and consequently real philosophy, gives way before the overmastering desire of proving the wished-for consummation.

I do not quite agree with the reviewer, to whom we have been listening, in the assertion that nationally we have conquered the first place in "speculative philosophy." Probably the German mind is still in advance of the English, and one evidence of this may perhaps be found in the decline of the influence of the doctrines of Darwin in that quarter.* I do not say that anything better is substituted in its place, for, as a disciple of Haeckel, quoted (*with disapprobation*) by Dr. Drysdale, says, "You must deny God and trample the cross under foot before you can become even a scholar, far less a master in natural science."†

This is outspoken language, and gives some notion of the abyss towards which *our* Evolutionists are, with what they think excellent intentions, *timidly* leading the way.

The result of *unsettlement*, such as is caused by the dreams of our scientists, may be studied by all in the scenes of the French Revolution of the past century, which *may* be, in time, forgotten in comparison with scenes yet to come in this nineteenth century, if Evolutionist teaching is to prevail. All society is based upon the recognition of the government of God. Man's special place in creation is ordered and appointed by the God who made him. Every individual child of Adam is *not* a chance production, but is truly formed as the handiwork of God, who is ever acting, and is, indeed,

* See Appendix G.

† *Häkelogonie, ein akademische Protest gegen Häckel's Anthropogenie*, von Prof. Fr. Michelis. Bonn, 2nd edit., 1876.

the sole source of all action in His creation, for "*in Him* we live and move, and have our being (Τοῦ γὰρ καὶ γένος ἐσμέν), for we are also His offspring." Compare the instruction in the 139th Psalm.

Hence man's duty to be content with the arrangements of God in society, and subject to those whom God has set over him. Hence the guilt of self-murder, and the command that whosoever sheddeth man's blood, by man shall his blood be shed.

In the providential dispensations, *man* is appointed in the place of God as magistrate or judge to care for the honour of the God whom he serves. Hence there is reflected upon him something of the glory of Elohim, as in the 22nd Psalm, "God standeth in the congregation of the mighty; He judgeth among the Elohim."

So that God associates man with Himself in the administration of justice. Man is to be the destroyer of his fellow-man when he violates God's laws, for the magistrate beareth not the sword in vain. This shows God's watchful care for His own glory, and for the good of His creatures, as the basis of civil government.

There seems to be a clear intimation in Scripture of the character of anti-Christian effort to set aside all rule and authority, to overthrow the sanctity of marriage, and to introduce universal licentiousness. The "dreamers" are denounced in Jude as bringing in this threefold mischief* (v. 8): *οὗτοι ἐνυπνιαζόμενοι σάρκα μὲν μιαίνουσι, κυριότητα δὲ ἀθετοῦσι, δόξας δὲ βλασφημοῦσιν.*

The dream of Evolution in so far coincides with the dreams of the Gnostics, the Nicolaitanes,† and others, as it tends to destroy in the conscience of mankind all thought of the sacredness of human life, and of the dignity of man's position in Creation. Although the teachers may not intend this, it is certain their scholars in the masses of mankind will, unless restrained by the civil power, carry out in practice a state of things similar to that described above. Why, then, proceed with their self-chosen occupation of unsettling the minds of the multitude, and destroying the old belief in Creation and Providence, giving us nothing in return but a mechanical self-evolving universe, presided over by blind fate!

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* See Smith's *Dic. of the Bible,—Nicholas, Nicolaitanes.*

† If this trinity of evil be indeed worthy to be established, let homage be paid unto it; but, if otherwise, let us not become heathens by inadvertence, and worshippers of a three-faced Baal under new disguises.

I can see no benefit in the attempt to propitiate such teachers. In my opinion, those who value the truth should take a bolder course, and show the inseparable connection between *false science, false religion,* and *false morality.*

I have endeavoured to lay before the Institute, as both a Religious and Philosophical Society, subjects requiring *thoughtful consideration* and bearing with increasing pressure on the interests of religious truth. It has not appeared to me either becoming or proper to adopt the style of lecturing, which I have objected to at the commencement. Rather would I continue a student amongst reverent students of the works of God, satisfied that shallow dogmatism will not meet the need of the Church in the coming age; neither will it avail the chosen people "to go down to the Philistines to sharpen every man his axe," but rather to learn for themselves how to fashion the best weapons of war, and to recover that supremacy in the regions of philosophic thought possessed of old time by the church of God.

I conclude with an extract from the letter of a scientific friend, presenting a chapter from the ever fresh and ever varied records of Providential care over man.

"You have read Mungo Park's story about finding the moss in the desert when he had lost his way, and fell down exhausted, expecting to die. The same accident happened to my brother-in-law. During one of those sudden storms which occur in the Andes, he and the guides lost their way, and, separating in different directions, my friend became at last so exhausted that he sunk to the ground, never expecting to rise again. A couple of condors were hovering over him, waiting till they saw life extinct, or nearly so, before they attacked the body. He had had no food since the previous day, as the *puna* or mountain sickness had been on him, and now was so faint he could not move. When lying on the ground, he observed a small snail-shell, the animal of which was moving slowly along the parched ground. He remembered my love for shells; he thought of the incident to Park. Still lying on the ground, he collected as many of the snail-shells as he could, thought of the watchful Providence which protected them, was inspired with new strength, made a fresh effort, and in half an hour arrived at a small village, where he received every attention."

"O Lord, Thou preservest man and beast! How excellent is Thy loving-kindness, O God! Therefore the sons of men put their trust *under the shadow of Thy wings.*"

APPENDIX.

(A. p. 197.)

"When old beech-trees are cleared away, the naked ground, in a year or two, becomes covered with strawberry plants, the seeds of which must have lain in the ground for an age at least."—White's *Natural History of Selborne*, edition of 1875, p. 361.

(B. p. 200.)*

It is worth notice that this destroyer, "the Sardanapalus of the Greeks," was himself destroyed, and himself the instrument of his own destruction—and that by *fire*.

This last king of Assyria, "who ruled over an empire stretching from Egypt and Lydia on the west, to Media and Persia on the east," "finding his city was taken, made a pile of all his valuables in the palace, and setting fire to it, perished in the flames."

(C. p. 219.)

Pendant toute la partie chaude de l'année, c'est à dire depuis le printemps jusqu'à l'arrière saison, les pucerons se multiplient exclusivement en mettant en monde des petits vivants, sans l'intervention d'aucun individu mâle, mais à l'approche de la saison froide, ils rentrent dans les conditions ordinaires, et se propagent par l'intermédiaire d'individus sexués comme les autres insectes. Les femelles, fécondées par les mâles, pondent des œufs qui passant l'hiver et n'éclorent qu'au printemps. Ces œufs donnent naissance à de nouvelles générations vivipares, qui se succèdent sans interruption jusqu'en automne, pour être remplacées à leur tour par d'autres pucerons, porteurs de sexe, lesquels terminent et recommencent tout à la fois le cycle reproducteur de l'espèce.†

(D. p. 220.)

With all the attempts to represent matter as self-evolving, it is *inexplicable why* the segmentation of the germ should occur, *why* the whole germinal disk should be afterwards divided; *why* the cross clefts should occur on each side of the mural cavity forming the protovertebra of embryologists; *why* the vertebral column should be formed, and so forth. No powers exist in brute matter sufficient to account for these things; no processes of crystallization have the least affinity with these varied developments. We could as reasonably expect a mass of "nitrogenous

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* *Assyrian Discoveries*, pp. 11, 93, 94.

† Balbiani, *Mém. sur la Génération des Aphides*, Science Nat. Zoologie, 1862.

hydrocarbon compound" to produce a watch as to exhibit these formative powers, and this is, indeed, a very feeble expression of the impossibility.

I find in *Nature** the following passage, which presents before us the most recent aspect of the "struggle for life" amongst the theories—"the brood of folly without father bred"—which succeed each other like froth on the waves of time.

"He (Auerbach) tries to controvert the statements of Strasburger, and sums up thus :—1. The longitudinally striated body, in the interior of the cell, is not the 'nucleus,' but the middle part of the so-called 'Karyolitic figure,' and therefore a product of the *mixing of the special substance of the nucleus with the surrounding protoplasm ;* and 2, that the young *nuclei* do not develop by the fission of the mother *nucleus.*"

From this I learn that the *nucleus* theory is insufficient, and that the *protoplasmic* explanation is devoid of all eal foundation, since the special substance of the nucleus, which no doubt plays an important part, is *different from protoplasm*, and the *two* require to be *mixed.*

And, moreover, how does the existence and coalescence of these *two* hyaline globules consist with the doctrine, that "the germinal element consists of a simple primordial cell"? As stated near the close of this lecture, "the formative or organizing *property* resides in the living substance of every organized cell, and in each of its component molecules"! The formative or organizing property resides in every cell, and also in every molecule *complete—of course in each*, or the statement has no meaning. Now, I know not how many cells there are in the ovum of a mammal, but, according to a calculation made by Mr. Sorby, the number of molecules in the germinal vesicle of the mammalian ovum is such, that if one molecule were to be lost in every second of time, the whole would not be exhausted in 17 years. Every one of these has attached to it the formative property, requiring only the *materia* to produce the number of animals above stated, say about 31,500,000 multiplied by 17.

Certainly, the molecules, or atoms—plain oxygen, hydrogen, nitrogen, and carbon must be greatly surprised at this sudden accession to their powers—properties conferred upon them, not by their creation, but suddenly, by the fertilization of the ovum, and liable to be as suddenly withdrawn, if anything should happen to the structure which they compose. We are not informed what *then* becomes of all these vast and varied attributes of the atoms, which "explain, in the most materialistic fashion, the *transmission of the organic and other properties* and resemblances between the parent and offspring."

On behalf of these atoms, and of what we call chemistry, in which we suppose that we have learned something about their nature, I must protest against the thoroughly unscientific way in which they are treated in the above statements.

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* September 20, 1877. Review of *Biology of Plants.*

It is clear that as yet we know nothing, and can know nothing, of the commencement of life. All our knowledge is of results, and not of causes; organization begins from the invisible and intangible world, and not from some imagined "protoplasm."

There is a fund of good sense and good feeling in the female members of the community to which I can appeal in the present argument. These know that if the "scientists" could succeed in constructing a Frankenstein, or man-machine, consisting entirely of atoms of oxygen, hydrogen, nitrogen, and carbon, together with phosphorus and certain earths and metals, plus eighty per cent. of water, the only feelings excited by such an apparition would be of curiosity perhaps, but of unmingled horror and disgust. The mother delights to see in her babe the reproduction of the very being she admires, and knows that her offspring will inherit the essential nature of its parents. As this nature cannot be shown to be entirely materialistic, she will be slow to credit the materialistic theories referred to.

There is a whole world of thought connected with the Third of Genesis, on subjects which science is bound to explain, but which it simply stumbles over, as it does indeed over others in the preceding chapters; as, for instance, over the question—how the species could be continued whilst in the course of ages the sexes were being "differentiated" one from the other? Some of these points indicate, in a way not to be mistaken, that man is a special creation, and wholly different to the beasts of the field.

(E. p. 221.)

The halves being respectively A, the whole nutritive system, comprising the observing faculties, the anterior part of the head, the osseous part of the face, the forms of the organs of sense, and the tone of the voice; and B, the whole locomotive system, naturally connected with the cerebel, or organ of will, the posterior part of the head, the few more movable parts of the face, as the external ear, under lip, lower part of the nose, eyebrows, and the external forms of the body, in so far as they depend on the muscles, as well as the forms of the limbs, even to the fingers, toe-nails, &c.; also probably the skin and its appendages.

Either parent may give either series A or B. The consequence is that no child is exactly like either father or mother; thus, if a child is said exactly to resemble the father from the series A, the probability is that the dispositions will be those of the mother, who will have communicated the series B.

Common observation, whether in reference to animals or to the human race, will sufficiently confirm the above in its leading details, which I take from Walker on "Intermarriage," and which conspicuously illustrate the pleasing variety which meets our view in Nature. Another provision, tending to the same end, is the constant crossing over of peculiarities of one

generation to the opposite sex; thus the daughters of a clever man usually partake of the superiority of their sire, and the marked influence of a superior mother on the boys is, I suppose, universally admitted, though in this case it is difficult to distinguish between what may be due to nature and what to education. The frequent resemblance of sons to their maternal uncles has been recognized for ages.

(F. p. 222.)

From the Rev. F. O. MORRIS, celebrated for his works on Ornithology.

"How any persons can ever have brought themselves to adduce in support of a preconceived theory the most extravagant idea that the exterior forms or appearance of (so-called) species of birds have been produced by the admiration of males for females, or *vice versâ*, does seem to me one of the most astounding notions that has ever been promulged; nay, as put forth, it appears, in the work under your review, even parts of the species, as, *e.g.*, parts of the wings of butterflies.

"You have mentioned some eminent names who have pronounced against this doctrine, and you might have added to them Dr. Carruthers as a botanist, and of Mr. Davidson as a geologist. Davidson says: 'Year after year has passed away without my being able to trace the descent with modifications among the Brachiopoda which the Darwinian doctrine requires'; and Dr. Carruthers, that 'no single case of evolution of one species from another has come within the observation of man.'

"Dr. Allen Thomson states in his address that it requires a practised eye to distinguish between the embryos of animals, birds, and reptiles, in the earliest stages of their existence. What is this but to admit that in these earlier stages of their existence there is a 'distinction and a difference' between them, and that it is distinguishable?

"And yet again, Darwin, as all the world knows, has never yet been able to produce or point to any one single existing creature of any kind in the act of evolution from one species to another; and that for the best of all possible reasons. Nor has he been able to do so in the case of the creatures that have so long been extinct; no, not a single one in any of the inconceivably vast *æons* of time he is obliged to invent to build his baseless theory on.

"Even so it is with the embryos of them. Can Dr. Allen Thomson show us any one of their embryos in any such transitional state? I trow not; not one does he, because not one can he."—*A Guard against the "Guardian."*

Review of "*Der Darwinismus*, by Dr. ALBERT WIGAND, 1875–77."

From *The Academy*, August 25th, 1877.

"In the second part Dr. Wigand leaves the narrow ground of natural science, and criticises Darwinism from a general and philosophical point of view. The theory is said to be no legitimate hypothesis, since it fails to

satisfy the five following essentials—(1) that the cause assigned be a *vera causa;* (2) that it be verifiable; (3) that the facts explained do not admit of being accounted for by other causes; (4) that it cannot be seen to lead to other consequences just as well as the actual facts; and (5) that it tend to further our knowledge of the unity of nature. The theory is thus essentially unscientific, and Dr. Wigand goes on to characterize it as a return to the method of speculation of Schelling (in his *Natur-philosophie*) and Geoffroy St. Hilaire, which consists in the attempt to deduce the complex and varied phenomena of nature from a few general ideas and principles, instead of gradually ascending to general laws by induction. But, again, Darwinism is no less false as philosophy than as science. All attempts to reach a theoretic unity in nature, whether by reducing all forces to one fundamental force, or by bringing all processes and effects under one universal law of causation, are destined to failure. Such attempts overlook the limits of our knowledge. Nature is made up of individual bodies with qualitatively unlike materials, forces, forms, and functions, and the universal laws of force are wholly inadequate to explain these complex existences. So, too, even though the processes of organic development invariably illustrate the law of cause and effect, we are for ever precluded from knowing how these intricate combinations and changes have been brought about. The question of the origin of species and of life is thus an insoluble one. Our author concludes his second part by seeking to re-affirm the inadequacy of all mechanical conceptions of the world and the necessity of assuming a personal intelligence as the source of universal law and of purpose in nature."

(G. p. 226.)

DARWINISM IN GERMANY.

Times Newspaper, 1877.

"The extraordinary success of the Darwinian doctrine in Germany may be traced to two causes. Science admired the conscientious accuracy displayed by Mr. Darwin in investigating the propagation of existing organisms, and the theorizing propensity of the German mind jumped at conclusions concerning the origin and primary production of animal life. While professors approved the laborious method pursued by the patient investigator of nature, the boldest inferences were regarded as reasonable and true by more speculative spirits when drawn from well-ascertained facts.

"Nor did the numerous metaphysicians native to the soil suffer the new theory to remain confined to the physical world. If animated bodies could be evolved from the slime of the sea, the power of motion and sensibility instinct in them seemed to differ from the human soul in degree rather than in kind. If a combination of chymical elements produced the rudimentary intellect of medusa and polyp, it was considered a rational inference that a compound of nobler ingredients sufficed to make up the thinking apparatus of *Animal Homo.*

"The chain of inferences did not come to an end even with this apparent climax. This terrestrial sphere, with its varied contents, having been duly accounted for by the progressive hypothesis of the novel lore, the transcendental was confidently taken in hand. Suppose the human soul to be carbon with a slight admixture of phosphor and a delicate flavouring of oxygen, the final result obtruded itself—that He in whose image the ancestors of modern philosophers believed men to have been created was no more than an aggregate of automatic forces. Though these extreme views were not universally adopted even by latitudinarians, still they found many disciples, and here and there an apostle.

"At this year's autumnal meeting of the German natural philosophers at Munich, a succinct account of this theory was given with considerable gusto by Dr. Haeckel, the Jena Professor of Zoology, and an eminent representative of extreme Darwinism in this country. A few of his remarks will suitably supplement what has been said. Having contended that the Biblical account of this planet's creation has long been demolished by geology, Herr Haeckel wondered that morphology should have been so slow to come forward and explain the origin and diversity of the animal world. According to him, the two principles of inheritance and adaptation explain the development of the manifold existing organisms from a single organic cell; while, were further argument needed to disprove supernatural intervention, we have only to turn to the frequent occurrence of undeveloped and useless organs in many types of the animal world to realize the truth. In this way the Creator is disposed of, not only as superfluous, but as a being who, if He existed, instead of being all-wise, would every now and then have committed the indiscretion of attempting to create eyes and wings which His power did not suffice to perfect. Then, passing on to the omnipotent cell, constituting the groundwork of animal bodies, he referred his audience to certain zoological inquiries proving the possession of motion and sensibility, of perception and will, even by those primary organisms consisting of but a single cell.

"Everything being thus dependent upon the cell, the lecturer at this stage became interested in the matter forming this marvellous organism. The cell, then, consists of matter called protoplasm, composed chiefly of carbon, with an admixture of hydrogen, oxygen, nitrogen, and sulphur. These component parts, properly united, produce body and soul of the animated world, and, suitably nursed, become man. With this simple argument the mystery of the universe is explained, the Divinity annulled, and a new era of infinite knowledge ushered in. It was a fitting conclusion to such a scientific *pronunciamiento* that the lecturer, who regarded his argument as incontrovertible, insisted that it should be taught in every school of the land. In a previous part of his speech he had certainly admitted that the theory of organic evolution could not be experimentally proved; but as he asserted in the same breath that no such demonstration was required, and that the facts observed enabled any one in his senses to draw the crowning inferences, this deficiency had nothing in it to shake his assurance.

"When this confession was uttered before the assembled professors and other aiders and abettors of the Muses, a shudder seems to have passed through the august conclave. The meeting, being the 50th since the institution of these annual assemblies, had a more solemn character than usually belongs to scientific gatherings. The extreme bias of the views expounded formed too marked a contrast to the lofty tone that pervaded the assembly to be ignored by the more moderate elements present. It was felt that, sceptically inclined as the nation and its learned professors might be, the majority were hardly disposed to adopt the materialist philosophy recommended to them as the only teaching consistent with the rational enlightenment of the times. It was perceived, too, that Herr Haeckel being too famous a man to be pushed aside, those of the audience who dissented had better announce their scruples, lest science should be led astray by the eccentricity of some and get into evil repute by the silence of others. It was one thing to tolerate and half approve the avowal of the like extravagant notions in ponderous volumes or scientific essays, comparatively removed from public ken; it was another to allow them to pass uncontradicted at a representative meeting, the observed of all observers. The bow had been too highly strung, and reaction was the consequence.

"Four days after the promulgation of Herr Haeckel's views, Dr. Virchow, the celebrated professor of pathology at Berlin, ascended the speaker's tribune to couch a protest against the sentiments enunciated by his learned friend. He began by reminding his hearers of past persecutions, with which he contrasted the liberty now allowed to every branch of science in Germany. Scholars, he went on, to render themselves worthy of the license given them in what they communicated to the world, should carefully distinguish between ascertained facts and the vast sea of conjecture, bordering upon the narrow strip of scientific *terra firma*. Facts should be taught; conjecture, if communicated at all to those still studying the rudiments, should be mentioned as conjecture. Were a different method pursued, science would run the risk of being misled, and, moreover, might fall into disrepute and have its freedom curtailed by those in power. Now he contended that the production of the first organism out of inorganic matter had never been proved; that the manner in which certain chymical elements were alleged to grow into a soul was incomprehensible to unprejudiced investigators; and that the connexion between monkey and man, let alone between crab and man, was unintelligible to those zoologists content to argue from what came under their observation. To elucidate these propositions, the learned professor imparted a variety of instructive details, strikingly grouped and wittily put, which those specially interested in the subject may read for themselves in his printed essay 'Die Freiheit der Wissenschaft.' The conclusion he arrived at requires to be clearly stated. He said:—

"'To be sure, if I do not believe in a Creator who breathed life into a clod of earth, I am compelled to assume the production of the organic

world by *generatio æquivoca. Tertium non datur.* If a man is at all anxious to settle the question of the world's origin, his only choice lies between these two alternatives.'

This is evidently intended to eliminate the question and represent it as comparatively indifferent.

"This declaration, coming from such a man as Professor Virchow, made no little noise in German lands. The great pathologist being considered a luminary in natural science, opposed to every species of orthodoxy and altogether innocent of faith, the cautious distinction he drew between fact and conjecture went far to convince the uninitiated that the production of man in the chymist's retort was not likely to be recorded among the discoveries of the age. The cold water the Professor dashed into the face of these vain imaginings has sobered public opinion and contributed to a wholesome reaction. Still, much is left unsaid in his speech which, in the opinion of those interested in the paramount question he declines to enter upon, ought to have been emphasized. The Professor, for instance, might have told us that even if Carbon and Co. had ever been observed to produce an organism, the atheists' argument that this proves the absence of a Creator would still be a rash and irrational presumption. By those inquiring into the cause of the surrounding phenomena the question in this case would have been asked, Who gave the chymical elements the power to produce life, if not a Creator? It is true that those who consider the question no concern of theirs will refrain from putting it; but if rationalists are driven to confess that the only alternative of man lies between acknowledging a Creator or shirking the subject, the advent of a crisis in the history of disbelief is announced by the leaders of the movement themselves. A dim notion of coming intellectual revulsion is pervading Germany at this moment."

A discussion of a general character ensued, in which the following took part: Rev. J. Fisher, D.D.; D. Howard, Esq., F.C.S.; Rev. Preb. Row; L. Dibdin, Esq.; and the Chairman; the Author having replied,

The meeting was then adjourned.

REMARKS UPON THE FOREGOING PAPER BY MR. JOHN WALTER LEA.

Heartily accepting the "philosophy" of the short paragraph on p. 194 of Mr. Howard's most interesting paper, I think he has been scarcely careful enough in his use of the terms "evolution" and "evolutionists" to make it clear that he is speaking of the materialistic school only, and that with the Christian evolutionist, who believes with full faith in Creation and Providence, he has, here at least, no quarrel. If, however, he believes that Haeckelism is the only consistent doctrine of evolution, I venture to think

that so grave a position ought not to have been tacitly assumed. Mr. Howard also puts together Prof. Allen Thomson, Lamarck, Wallace, and Darwin, as advocates of "these doctrines," whereas their doctrines are not identical, nor do they all necessarily make "Creation give way to evolution."

"If *life*," says Mr. Howard, "can only proceed from *life*, the whole doctrine of evolution fails at the very commencement" (page 192). Here we certainly need the qualifying word "materialistic," for the Christian sees no difficulty. Evolution necessarily postulates a starting-point, and for the Christian (or even the Theist), that starting-point is the living God. Non-Theistic evolutionists, like Tyndall, are worse off, granting Mr. Howard's "if"; but they do not go quite so far; only saying that there is no *evidence* of the present evolution of the living from the non-living; they do not affirm that it *cannot* be even now. When, however, they assert that it was so once, their own practical science is their most formidable foe.

Mr. Howard cannot really misapprehend the meaning of the phrase, "the survival of the fittest," but he certainly seems to me to misrepresent it, as though "the fittest" meant the highest or noblest, instead of merely the one most fitted to succeed under given circumstances. The "universal prevalence of destroyers" does not discredit the doctrine,—rather the reverse. They destroy those least able to destroy or to escape them; those, that is, who on common ground meet them at a disadvantage. A cat destroys a garden-warbler; Mr. Howard asks, "Is the cat more fit to survive?" Not, perhaps, more "fit," but more fitted, under the conditions of the case. Change the conditions a little; let the cat's only chance of life lie in catching the bird; let the warbler be a little more on the alert, or a little quicker in its movements: it escapes, the cat dies. Under these circumstances the bird is most "fitted to survive," and survives accordingly.

In fact, Mr. Howard, in the next page, in forcible and eloquent language, teaches the same doctrine:—"There is no mercy in the ordinary course of nature. Her language is woe to the weak and to the miserable." "As soon as health and strength decline, numberless destroyers seize upon their prey." "Nature is concerned for the perfection and continuance of the race rather than of the individual. . . . It is obviously an advantage that the strongest should survive." What is this but "the survival of the fittest"? "But what," adds Mr. Howard, "are we to say about the defeated?" That they do not survive because they are not so fitted. The weakest go to the wall.—*Væ victis!*

I entirely agree with Mr. Howard, that the special distinction which differentiates man from the lower animals lies in his "pneumatic nature." But it is not so clear that on this ground "he *must* have required a separate act of creation" (p. 211). Surely it were enough for the *necessities* of the case if the πνεῦμα were separately created, the body and soul being derived from existing forms, with such modifications as it might please God to ordain. There is nothing contrary to either Creation or Providence in believing that God might as readily, and, to speak reverently, as fittingly, have added

special qualities to the ordinary product of hereditary transmission as have created an entirely new creature, to a very great extent on an existing model. The hereditary descent (to which Mr. Howard refers) of not only physical, but mental and moral qualities, seems to me a strong argument for the view that we derive our *whole* nature, and not our material elements only, from our parents.

Materialistic evolution has no more resolute opponent than Dr. Lionel Beale; yet the doctrine of vitality maintained in his many works appears to be, and I believe really is, wide enough to cover not only the derivation of πνεῦμα from ψυχή, but the whole field of a strictly Christian evolution.

Mr. Howard (p. 216) regards the unity of plan in the Creator's mind as a sufficient explanation of the unity manifested in His creation, without having recourse to any ideas of "derivation." Doubtless it is sufficient on the theory of "special creations," since the Divine Designer must adhere to His own design. But surely it is equally consistent with the theory of the execution of that same design through "derivative creation." Which theory is the more probable must be settled hereafter by patient observation and careful induction. This only (as Mr. Howard would be among the first to allow), and not the set of the popular current, nor even the authority of great names, must ultimately decide. But as Mr. Howard has laid just stress on the convictions of such men as Agassiz and Von Baer, I may observe that an increasing preponderance of eminent biologists are accepting the doctrine of evolution in some form or other. And many of these and of their humbler allies would say, I believe, as was said by Charles Kingsley, that it has "opened a new world to" them, "and made all that" they see around them "if possible even more full of divine significance than before."—(*Memorials of Charles Kingsley*, vol. ii. p. 156.)

REPLY BY MR. HOWARD.

I feel indebted to Mr. Lea for the opportunity he has afforded me of giving some explanation of my views of "Christian evolutionism." The enforced brevity of this reply may render it in some respects unsatisfactory; but it will not, I trust, be found wanting in courtesy to those who hold this modified doctrine, and whom I know well how to distinguish from the materialists of Haeckel's school.

I may assume without offence that the ideas received by a number of Christian men are not, *necessarily*, *Christian ideas*. To solve this question we must refer to the common standard of Christian truth in the Scriptures. Otherwise there is no certainty that novel views, "opening a new world" to the recipient, may not prove as injurious as the heresies that have infested the Church in all ages, and which have always come in with the boast of superior illumination; the Gnostics rejoicing in light and consolation which the more conservative portion of the Church might gladly have shared if they had not feared to desert the old "wells of salvation."

maintain then, that there is *really* but one doctrine of evolution, and that, as I have sought to show, this is essentially atheistic, or rather *pantheistic;* that it may be in part held by Christians, but is no part of Christianity. "Evolution," according to Mr. Lea, "necessarily postulates a starting-point." This starting-point, *according to the Scriptures*, being a miracle of the most stupendous magnitude, and, in the case of man, of the most wonderful proportions. "The first man, Adam, was made a living soul." * He was created at once *perfect* and the head of all the human race. "In Adam *all* die," they all share in the results of his transgression. There can be no Christianity where this is denied; and the truly affecting and consoling portion of the burial service to which I have referred loses all meaning to the mourners, who so generally in this country find a source of consolation in the words of Scripture there quoted. All hope in "the last Adam" is gone.

This creation of Adam was accomplished, according to the Scriptures (which Christ declared cannot be broken) in a manner most inconceivable and objectionable in the view of science; in fact, only to be received by faith. Jehovah Elohim formed man out of the *dust of the ground* (not out of a previously existing ape) and *breathed into his nostrils the breath of life*, and man became a living soul." This is not "*derivative creation*," but it is all we have to rest upon—*this* or *nothing!* As to speculations concerning what God *might fittingly* have done, I look upon them as more suited to some other place where time could not be unprofitably wasted.

> "Others apart sat on a hill, retired
> In thoughts more elevate, and reasoned high
> Of Providence, Foreknowledge, Will, and Fate,
> And *found no end, in wandering mazes lost.*"†

If the Old Testament in Genesis, and the New in 1st Corinthians, hold good, there is no question that man is a special creation. A continually developing mollusk or an improving baboon could not stand at the head of the human family, involving all mankind in the consequences of its [his ?] actions.

As regards the rest of creation, we are not told in what manner to explain the expressions—"Let the waters bring forth abundantly"; "Let the earth bring forth the living creature." I freely confess I have no conception *how* this could take place, and that I only receive the notion as an article of faith. I am elsewhere told‡ of "quaternary compounds," assumed to be transparent, since they have never been seen, consisting of eight atoms of carbonic acid, six atoms of water, and one of nitrogen, which somehow have the gift of coming to life.§ In these, if

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* 1 Cor. xv. 45. † *Paradise Lost*, Book ii., l. 557, &c.

‡ *Physical Life*, by A. Buchanan, M.D., President of the Faculty of Physicians and Surgeons of Glasgow, and one of the Vice-Presidents of the Glasgow Philosophical Society (page 34).

§ These are natural constituents of the atmospheric air, which, on being diffused through water, combine with the mineral matter which the water holds in solution, and so (!) form an *exoplasm* which assumes the organic form, correspondent to its chemical constitution.

they were not *intangible, imperceptible,* and *invisible,* and if they could be seen to be imbued with life, I should reverently believe, but with as sincere astonishment as if I saw an image of plaster of Paris suddenly endued with living breath ; and I should then at last think I saw Genesis enacted afresh before my eyes !

The Scripture informs us, in accordance with all modern discoveries, that everything was created *very good* in the sight of God. The Creator did not form imperfect essays of things to be afterwards evolved and their defect remedied by natural selection. Each creature is made after its kind, למינה,* and apparently *after a pre-existing idea* in the mind of the Creator, every plant in the field *before it was in the earth,* and every herb of the field *before it grew.* There is order, fixedness, and design from the first, and this is essentially the opposite to all that is involved in the doctrine of evolution, however modified. The Creation, as seen in Scripture and as studied in the records of geology, is perfect in each era from the beginning. The universe, as seen by the consistent evolutionist, is continually self-evolving, but still imperfect, and having its blunders rectified and its imperfections remedied, by a pseudo-divine power. The latter, or Pantheistic view, cannot be made consistently to agree with any one portion of Christian revelation.

All Christians believe in the watchful care and superintending hand of God extended over all His creatures, and many identify this with the Darwinian doctrine of " Natural Selection," or the improved phrase " survival of the fittest." I shall endeavour to show the difference as far as my space will allow. Both these evolutionist expressions are designed to convey the idea of continual improvement, of advantageous change resulting in development from one form into another, higher, more advantageous, or in some sense *fitter,* according to our views of creation.

Now, I am bold to assert that whatever may be the occupation of the imaginary power of Darwin, such is not the occupation of Divine Providence. The ways of Providence are confessedly mysterious ; but as regards the best field of observation we possess, they do not result in what would be, *to our apprehension,* the survival of the *fittest.* I care not what standard of fitness is adopted, it will be found that " the race is not always to the swift, nor the battle to the strong, neither yet bread to the wise, nor yet riches to men of understanding, nor yet favour to men of skill ; but time and chance happeneth to all."

Has it not been said with some show of truth that—

> " The good die first,
> And they whose hearts are dry as summer dust
> Burn to the socket " ?

It may be said that all this is explained by a future life. Let us turn then to the physical organization of man. Has this improved by the survival of the fittest ? All history, and I believe all geological research, shows the contrary. Whatever interposition of Divine power may have been put

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* Gr. *ἰδέα.* See Ges. Lex.

forth, when God beheld and drove asunder the nations, to render the different races of mankind suited to their various abodes; there is no such "selection" now. Every one knows that the children of English parents degenerate in India, probably also in Australia. The French, according to their own calculations, would soon die out in Algeria if left without fresh settlers. I hope I shall be pardoned for suggesting that the vigorous arterial circulation suited to the Teutonic race when called to populate the damp forests and marshes of ancient Europe, is not compatible with the powerful overstimulus of sunlight in America. From some less obvious cause it is not thought that the Spaniard thrives well in South America; and yet, if we judge by the success of these nations in taking possession of these countries, they are the *fittest* to survive.

If we turn to the animal creation, I suppose every one will admit that the fittest do *not* survive. If we study the Assyrian sculpture or the Egyptian records, we find more noble, more varied, and higher types of animal life, than any that now exist in those; and if we judge of fitness by aptness for domesticity, we learn that the Egyptians had succeeded in making useful to themselves, more than the few animals which we either do not now possess, or at least not as tamed creatures. If we go back a certain number of years, we find by the records of the past that man contended with and subdued animals of giant bulk and proportions, from which, if armed only with flints, he would, I suspect, now be glad to flee. (See Job xli. 30, original.)

There has been no improvement in the vegetable creation since the days when Solomon spake of trees, from the cedar-tree that is in Lebanon even unto the hyssop that springeth out of the wall. The only change has been that the fittest have *not* survived. The choice balsam has as much perished from Jericho as has the *reem* (unicorn) from the Jordan. The apples of Sodom and the grapes of Gomorrah may still be referred to as examples of "the survival of the fittest," but the vineyards have perished from Engedi, and "the clusters of Camphire" might be difficult to meet with. (Canticles i. 14.) The cedars of Lebanon have for the most part fallen to supply materials for the ships of Tarshish, as their congeners the deodars of the Himalayas have been hewn down, to a large extent I fear, in order to supply sleepers for railways. The Americans begin to mourn over their ravaged forests; and everywhere man has been destroying the beauty and even the utility of creation. Many plants and animals have perished; and "natural selection" has not furnished us with one new species of either. In 3,000 years this power has done literally nothing.

Mr. Lea thinks that I either misapprehend or misrepresent "the survival of the fittest." This is not the case, for I see it all around me; but what is the result?—simply that in this contest "the big battalions" do not always have their own way. The result of the struggle is that an infinite *variety* survive, and if you say these are the fittest to survive, you simply enunciate the proposition that the combination of circumstances happens to have favoured these the most.

At this season of the year (May) the varied kinds of grass and herbage seem emulously engaged in solving the problem "which shall survive." Moreover,

in the portion of my garden set apart for the cultivation of the e s common British plants, it is a daily care to prevent these from being elbowed out of existence by the seeds from the meadows taking root amongst them. The fields around me show that "natural selection" succeeds almost as well as artificial cultivation, for land on which for twenty or thirty years I have bestowed some pains with different artificial manures, seeking to improve the herbage, does not much surpass that on which no such care has been bestowed. If the plants of grass und herbage were counted in a square yard of each, I fancy there would be but little difference either in the *variety* or the *plants* themselves, after all my efforts to assist some in the struggle for life.

Why, then, do I quarrel with this expression—"the survival of the *fittest*"? My objection is simply to the last word, *and* to that which is implied in it. Fittest for what? For the good of man? I suppose not. Taking the particular instance of what is in sight whilst I write,—fields and trees, adapted for the use and pleasure of man. Are these in their natural condition? So far from it that in the time of our British ancestors all was, as far as we can learn, a wild forest, and even now the soil appears most adapted to the growth of trees. Man has altered all this, and that only too effectually—I wish he had left us some specimens of the fine old secular oaks of the Druids—so that we have an unknown period of *forest*, a millennium of cultivation, and next, if the rage for building continues long enough, the district will form part of "a province covered with houses," filled with people engaged in a life-struggle to realize the survival of "the fittest." Which of these three states, or the three in succession, was the original design of the Creator—the *fittest* in His sight? All is under the control of a watchful Providence, no doubt, but what of "the fittest"? I do not ask whether the *optimist* view is correct, or whether the English climate is the best that can be conceived, or her pastures the most fertile in the world, nor do I enter on the questions brought before us in Scripture as to "the groaning of creation." I feel too much my restricted space. I ask simply what is meant by "the fittest"?

I answer that it is a cautiously-guarded phrase, meant to take the place of "Natural Selection," and to *insinuate*, without stating the questionable fact, that there is a power existent ready to take advantage of every slight variation that might possibly be advantageous to the plant or animal, and so, gradually to develop legs and wings where they did not exist, or to form an eye or an ear by gradual moulding; or in the end to bring out man as the crowning point of this mysterious jugglery of the universe. God is deprived of the glory of His attributes! The heavens declare the glories of evolution, and the whole varied Kosmos shows the admirable effect of "the survival of the fittest"! This is why I object to the phrase.

My conviction is, that however subtilely woven the theory may be, it is a piece of new cloth patched on to the old garment of Christian revelation, which cannot by any means be made to adhere—that *Christian Evolutionism* is pre-eminently a failure.