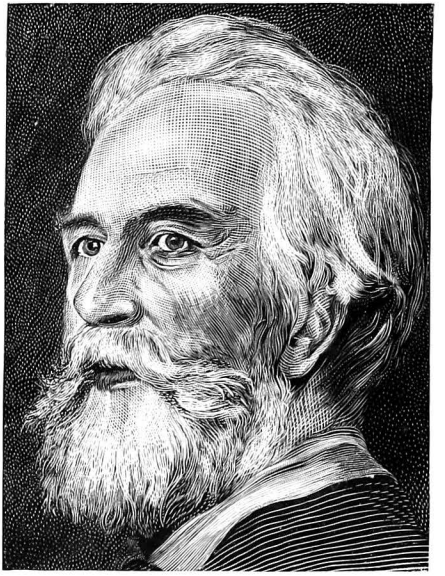
HAECKEL'S CRITICS ANSWERED

JOSEPH McCABE



From the painting by Franz von Leubach, 1899 (reproduced in "Jugend")

HAECKEL'S CRITICS ANSWERED

BY

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[*Issued for the Rationalist Press Association, Limited*]

WATTS & CO.,

17, JOHNSON'S COURT, FLEET STREET, LONDON, E.C.

1910

PREFACE TO SECOND EDITION

SINCE the first edition of this work appeared, the continued and unparalleled success of Professor Haeckel's book has attracted a further series of criticisms. The fact that the *Riddle of the Universe* circulates to the extent of nearly half a million copies in England and Germany, and has been translated into nearly a score of languages, is a sufficient answer to those who would belittle its significance Unfortunately, the "replies" to it are rarely worth serious perusal, and I need say only a few words on the latest crop of straggling criticism

In particular, I must comment on an effort that has been made to discredit Haeckel's work by asserting that the venerable zoologist has confessed to having tampered with, or "falsified," the illustrations to his scientific works. As I showed in the *Literary Guide* (May 1, 1909), the charge, as it is circulated in this country, is a complete misunderstanding, if not a deliberate misstatement, of the facts A German writer of little repute, Dr Brass, first published the accusation, and Haeckel humorously replied that "six or eight per cent." of his drawings were so "falsified" The publication of these words in the religious Press, without the explanation he at once added, and without any notice of the later development, is only a piece of the lamentable insincerity with which Haeckel has been treated He plainly explained (*Berliner Volkszeitung*, December 29, 1908) that he had merely done what "the vast majority" of scientific men were accustomed to do in the illustration of their works The supposed confession was merely an ironic refusal to take the charge seriously To say, moreover, that there was anything misleading in Haeckel's drawings of embryos is ludicrous He gives the drawings of many other embryologists, and even photographs, for the purpose of comparison, side by side with his own. Where he sketches a hypothetical animal—which is extremely rare—he plainly indicates this

The sequel also must be recalled At once forty-six eminent scientists of Germany signed a strong repudiation of the charge, and one of them —Professor Rabl, one of the leading German embryologists—retorted with deadly effect (in the *Frankfurter Zeitung* and the *Freidenker*, March 15, 1909) that Dr. Brass himself had been flagrantly guilty of the very practice he was

unjustly charging against Haeckel Professor Keibel and Professor Hertwig, two other authorities of the first rank, passed equally severe strictures on the scientific work of Dr Brass

That so ridiculous a charge should have been circulated in this country, and the sequel wholly concealed, is, unhappily, typical of the whole controversy The fresh replies to the *Riddle*, which lie before me, are generally tainted with the same dishonesty of tactic and triviality of aim. As I pointed out in 1903, Haeckel has the great majority of his colleagues with him in most of his conclusions Where a certain number of them differ from him is on certain high and distinct issues, especially on the question of deity, and serious criticism should be directed to these Instead of this, the fresh series of critics, like the older ones, lose their way, and confuse their readers by assailing positions (such as the "law of substance"—*i e*, the indestructibility of matter and energy—and the fact of evolution) which are an established part of science, and waste whole pages on phrase-chopping, misquoted or misunderstood statements, and irrelevant issues

Two eminent men of science in this country have entered the field to some extent since 1903 To Sir Oliver Lodge I have replied in a separate publication (*The Origin of Life*), and to Principal Lloyd Morgan, whose fine attitude towards his great colleague in zoology is a standing rebuke to the clerical Lilliputians who have heaped abuse on Haeckel, I have devoted a few pages (as well as to several other critics, such as Dr Saleeby) in the preface to the fifth edition of the *Riddle* (1906) Principal Lloyd Morgan is a Monist He admits the evolution of mind and rejects the doctrine of personal immortality, but retains a belief in a supreme controlling intelligence This is generally the attitude of those few of our scientific men who to-day profess any form of religion That attitude must be considered with respect, and I must refer the reader to the seventh chapter of the present work for my appreciation of it

On the other hand, most of the criticisms are too trivial or uninformed to be taken seriously Such are the slight and superfluous papers published by Dr Marcus (*Monism*), the Rev L C C Hunt (*Rationalism Controverted*), Allen Clarke (*Science and the Soul*), and Robert Blake (*Haeckel's Fallacies*), and two anonymous works, *Hegel, Not Haeckel* (which does not touch Haeckel) and *Haeckel's Riddle Criticised* (the least informed of all) Hardly more worthy of notice, in spite of their authorship, are the Rev J F Tristram's *Haeckel and His Riddles* and Professor J G Tasker's pamphlet, *Does Haeckel Solve the Riddles?* The former is an encyclopædia of petty

criticisms without point, or founded on misquotation or misinterpretation of Haeckel Its author's acquaintance with science may be judged from his airy assurance that "few scientists" now admit the origin of the living from the non-living The overwhelming majority of zoologists admit it, in the only sense in which Haeckel does Professor Tasker's few pages bring no new point to the controversy, and are marred by much misinterpretation of the words both of Haeckel and myself.

More pretentious are the works of the Rev Mr Ballard (*Haeckel's Monism False*) and Father Gerard (*The Old Riddle and the Newest Answer*) If Mr Ballard had reduced his 600 pages to 100, had been more sparing with his vulgar abuse of his opponents, and had not so frequently manipulated the passages he quotes from the *Riddle* and the present work, he could have given us a readable criticism As it is, his work is merely an enlargement of that unfortunate apologetic of his to which many pages—too many pages, my readers say—have been devoted in this work, where all his serious points are met The Jesuit writer, Father Gerard, has given us a remarkable work If it had been written forty years ago, it would not have been without point, as a recent publication it can only serve to establish finally the charge that we bring against Catholics of lagging half-a-century behind the world Nine-tenths of his authorities are at least twenty years old He spends pages in proving that Haeckel does not know the meaning of scientific "law," or in refuting such plain scientific truths as the evolution of the horse He tells us that science has thrown no light whatever on the origin of life or sense, and that the scientific way to approach the question of the primitive origin of life is to study its condition to-day! The culmination of all this extraordinary ignorance of recent scientific progress is reached when he gives (in an old form) Haeckel's twenty-two stages in the pedigree of man, and quotes some ancient writer as saying that "not one of these creatures has ever been seen, either living or fossil" Father Gerard not only approves this, but adds, "In this way Haeckel habitually solves the Riddle of the Universe" Any tyro in science could have informed him that to-day *we know every single one of these stages*, either in living or fossil form, or both The whole work is stultified by this complete ignorance of the last twenty years of scientific progress

J M

January 1, 1910.

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HAECKEL'S CRITICS ANSWERED

CHAPTER I

SOME GENERAL CRITICISMS, AND A LESSON IN MODESTY

SOME forty four years ago a young German medical man was spending laborious hours in an effort to penetrate the secret of the living organism From his earliest years he had been powerfully attracted to the study of life He had written a small work on botany whilst he was yet a boy at the gymnasium. He had then had the advantage of a training for the medical profession under such masters as Kolliker and Johannes Muller He had published an essay on crabs in 1857, and in 1859 he was pursuing a most important inquiry into the microscopic life that fills the blue waters of the Italian coast But his many lines of research had not as yet led to any large conclusions He stood perplexed between the discarded views of the older biologists and the dim vision that was slowly breaking upon the scientific mind of the time His own revered master had insisted on the fixity of the various species of organisms, but it was an age when every note of the time spirit whispered "advance" in the ears of the younger men The despotism of Genesis had been broken by the new criticism, and the Mosaic barrier to research was being trampled under foot. The young scientist, then in his twenty-seventh year, returned to Berlin in 1861, and heard that during his absence an English naturalist had published a startlingly revolutionary view of the whole kingdom of life He obtained a copy of *The Origin of Species*, and saw at a glance that a great truth had been discovered In the light of the new theory of evolution, fulfilling the intuitions of Goethe and the speculations of Lamarck, the vast realm of animals and plants began to exhibit the order and rationality he had so long sought

The very valuable and brilliant work he had done in Italy secured for him a professorship at the University of Jena, and he at once devoted himself to the creation of the new biology In 1863 (his twenty-ninth year) he gave an able address on the new theory before a congress at Stettin, where all the most distinguished scientists of Germany were assembled It was his baptism of fire in a life-long campaign against error and prejudice The vast majority of the scientists present scoffed at Darwin's idea, and said it was not a matter for serious discussion "The harmless dream of an after-dinner nap," said one distinguished zoologist, and another said they might as well discuss "table-turning" A famous botanist present said there was not a single fact of science in its favour, though Darwin's book alone contains an overwhelming mass of evidence In France the great Cuvier was crushing the young theory with the weight of his authority From the pulpit of Notre Dame the brilliant Lacordaire was assuring men that "its father was pride, its mother lust, and

its offspring revolutions" The young naturalist went back to Jena with a stern and grim resolve to pursue truth through fire and water, and, as Huxley was putting it after a like experience, to "smite all humbugs" that lent their authority to error Five years later he published his *Generelle Morphologie*, which Huxley calls "one of the greatest scientific works ever published," and which considerably advanced the liberation of Germany from the old error Two years afterwards he published his *Natural History of Creation*, of which Darwin said that, had he read it earlier, the *Descent of Man* would probably never have been written With phenomenal industry, with brilliant success, and with a moral idealism of the highest order, he continued his research into the nature of life and the nature of man, and long before the close of the century he was in the foremost rank of men of science

His progress was impeded by the usual conservative hostility For years the ecclesiastical party strove to drive him from the university, and enforced a boycott of him and his family. One day a prelate approached the Grand-Duke of Weimar, and urged him to put an end to the scandal of the heretical professor "Do you mean to say," asked the Grand-Duke—for the spirit of Goethe still lingered in the court of Weimar, "that the professor really believes these things he teaches?" "He certainly does," assured the cleric "Then the man is only doing what you are doing yourself," was the amiable retort At another time the professor himself approached the head of the university, Dr Seebeck, an orthodox thinker, and offered to resign his chair, to end the trouble, as he would never swerve one inch from the path of integrity and faithfulness to what he considered to be the truth Dr Seebeck bade him remain, and his name has, in return, taken the name of Jena to the ends of the earth. His books have been translated into twelve languages. His name will rise first to the lips of any informed student in the civilised world, from Yokohama to St Petersburg, from San Francisco to Calcutta, if you speak of zoology or embryology He holds four gold medals for research, and more than seventy diplomas from so many academies and learned bodies all over the world, who have desired to have his name on their roll of members or associates When, in 1881, the Asiatic Society of Bengal resolved to nominate six special "centenary honorary members," he was the one chosen for Germany On the occasion of his sixtieth birthday, ten years ago, the *élite* of the scientific world sent their greeting to the man "who has devoted his life in unselfish devotion to science and to truth, who has opened new paths and inaugurated fresh knowledge wherever he has turned, and who has ever given his best for the moral welfare of humanity"

That is the real Ernst Haeckel

That is the man whom our ecclesiastical M A 's and our D D 's have lately been accusing of "scientific humbug" and "insolent dogmatism" and "childish credulity" and "mendacities" and "rhodomontade," of being "an essentially ignorant guide," "an atrophied soul," and "a rude, ill-mannered, ignorant child," of "poisoning the minds" of the people and leading them "back into barbarism," of "prostituting himself," of making "misrepresentations so gross and glaring as to make it extremely difficult to credit him at once with mental ability and sincerity," of "having forfeited all right to speak as a serious scientific man," and of being "so flagrantly prejudiced, so false to fact, and so insolent in tone, as to require much self-control to keep one from flinging the book away in disgust" I am not quoting itinerant Christian Evidence lecturers, but the deliberately published observations of Dr Horton, Dr Loofs, and the Rev. Mr Ballard

We need not tender our sympathy to Professor Haeckel. He has been listening to language of this kind ever since

he published his famous *General Morphology* in 1866 He may have by this time a kindly theory that it comes naturally to a mind that breathes a mediæval atmosphere, and that still holds the general principles on which the Holy Inquisition was founded But it is worth while investigating how all this lurid language is reconciled with the culture and scholarship and tolerance which are claimed for the modern clergyman The writers of these picturesque phrases would indignantly repudiate the notion that they were angry merely because Haeckel's views of the nature of man and the constitution of the universe contradict their own, and tend to diminish the number of their followers They do, indeed, reject the substance of his speculations, but their *quarrel* is with the manner in which he pursues and expounds them A few years ago he published a summary of the opinions he had arrived at on a vast number of problems of science, philosophy, history, and religion As he saw his great colleagues pass on one by one to join "the choir invisible," he decided to draw up this "last will and testament", to look back over the sombre fields of half-a-century of warfare, and sum up the issues of the conflict. In Germany his *Riddle of the Universe* sold 9,000 copies in two months, and has led to an appalling outpouring of controversial ink In England it was eagerly and extensively welcomed in the more expensive edition, and in the cheap form it is circulating to the extent of nearly 130,000 copies I have waded through the turgid flood of criticisms it has called forth, and will deal first with those charges which tend to palliate the outrageous phrases I have quoted before I proceed to the criticisms of its substance These ponderous names are not flung out, we are told, from a secret consciousness that sober criticism would have little force They are reluctantly penned out of regard for the ethic and aesthetic of controversy Professor Haeckel, whom Mr. Mallock has saluted in the *Fortnightly Review* (September, 1901) as "one of the most eminent and most thoughtful men of science in Europe," whom an antagonistic reviewer in *Knowledge* describes as "impelled by no motive but a love of truth," and says that "to know him is to love him," and "there are few who have worked harder and at the same time, more brilliantly, for their day and generation," whom the *Westminster Review* regards as "a great biologist and thinker," and whom even Dr. Dallinger calls "a man of large scientific attainments, a biologist of the highest repute, and possessed of the keenest acumen" (*The Creator*, p 18) —this Professor Haeckel has, it seems, greatly violated the good taste and the ordinary morality of literary work in his *Riddle of the Universe* Mr Ballard epitomises the charge very neatly in the *British Weekly* The book, he says, "teems with exhibitions of bitter prejudice, arrant dogmatism, unwarranted assumption, uncalled-for insult, logical failure, and self-contradictions", and the misguided British public calls for five editions of it; in spite of all the abuse that is heaped on it and all the secret and public manœuvres that are directed against its circulation

A desperate champion might ask the reader to reflect on the atmosphere of invective in which Haeckel has lived for the last fifty years—from Lacordaire's tracing of the parentage of evolution to Dr Talmage's sermons on the subject only four years ago—and might recall that even dainty prelates like Bishop Wilberforce could utter bitter insults in that charmed region He might argue that a Haeckel was not pledged to turn the other cheek to the smiter He might point out that it is not soothing to have had to spend half a life in overcoming what is now acknowledged to be a foolish resistance, yet see the same theological forces arrayed at a more advanced position to-day But, in truth, we shall do better to ask, what is the æsthetic and ethical standard of controversy cherished by Dr Haeckel's critics, and

how far does he really fall below their shining example?

There is Dr Horton, for instance, whose sensitive nature is outraged by Haeckel's rude comments on some of the Christian beliefs. Now, I have been a priest and I know how largely rhetorical this kind of indignation is, and how effective it is sometimes in preventing a book from being read. As a fact, one who was present when Dr. Horton delivered his philippic tells how, when the preacher read out in tremulous tones the famous mother-in-law passage (and the like) from the *Riddle*, his audience was really shaking with suppressed laughter. However, let us examine Dr. Horton's discourse,[1] and learn the better manners which he desiderates in Haeckel. He opens with a reference to "the depths of degradation and despair into which the teaching of Haeckel will plunge mankind," though, of course, to speak of Dr. Horton's views as degrading would be considered insulting. Then, though "there has been no more diligent and successful investigator of the facts of nature than Ernst Haeckel during the century that has passed," he is a child at moral and religious reasoning, "a rude, ill-mannered, ignorant child;" he is "an atrophied soul, a being that is blind on the spiritual side." The "spiritual side" being a blend of moral and intellectual faculty (if it is anything more than imagination), this is grave; but Dr. Horton says it "in the interest of souls and truth." Presently he finds Haeckel an "utterly unsatisfactory and essentially ignorant guide," an "unthinking mind" with whose "obvious weakness and ignorance" and "childish credulity" "the rationalist press gulls the ignorance of the public." Dr. Horton admits that modern science "must gradually affect the view of man, even the view of God, which we drew from the matchless revelation of the first chapters of Genesis" [this in Hampstead, in the year of grace 1903!], and must modify "the naïve, but essentially correct, conceptions of our ancestors"; but Haeckel asks too much. I will touch in the proper place Dr. Horton's brief argumentation on the origin of life and the origin of the mind,[1] and will only admire here the delicacy with which he points out the spiritual consequences of monism. "Men who have no belief in God and immortality sink to the level of the brutes," and Haeckel is "anxious to sweep us back into this barbarism under the name of progress." Haeckel is not conscious of the degradation that has passed upon his spirit" through rejecting the particular solution of the world-riddle which Dr. Horton recommends, but in any one who does so "the soul is shrunk, the mind is warped, the very body must carry its marks of degradation." It is true that the preacher's sense of humour awakes at one point, and he disavows any intention of imputing these "bestial levels" to Haeckel himself, but he seems to forget the reservation, and ends in a most ludicrous strain of commiseration. There is nothing half so insulting and offensive in Haeckel.

Passing by Dr. Loofs (whose little work is one of the most spiteful and painful diatribes that has issued from a modern university), as he does not claim to be an English gentleman, we may turn to the Rev. F. Ballard for an exhibition of those manners which Haeckel has neglected to cultivate. Mr. Ballard is said in the religious press to have proved that "Haeckel doesn't count," and it will be expected from the precision and force of his indictment of Haeckel's manner (which I have quoted above) that this

[1] It is published in the *Christian World Pulpit*, June 10th, 1903.

[1] Dr. Horton's knowledge of the controversy may be tested very well by his statement that Bois-Reymond, Vogt, Büchner, and Baer, "perhaps four of the greatest men of science in the nineteenth century in Germany," came to "the recognition of spirit as the author of consciousness." Not one of the four ever recognised anything of the kind, as we shall see. Bois-Reymond and Baer remained agnostic, whilst Büchner and Vogt were actually the leaders of German materialism up to the moment of death.

scientific clergyman will be quite the Beau Brummel of religious controversy He has written a chapter on *The Riddle of the Universe* in his *Miracles of Unbelief*, but this has been swallowed up in his great attack in the columns of the *British Weekly*. The later articles of this series refer to the able editor of the *Clarion*, and Mr Blatchford has shown a sufficient command of appropriate language to dispense with my services I confine myself to the first three articles (July 23rd, 30th, and Aug 6th) It proves, on examination, that twelve columns out of the thirteen are mainly preliminary comments on Haeckel's morals I will deal with the thirteenth column (which will turn out to be very largely a question of *Mr Ballard's* morals) in its proper place, and will here briefly examine the general criticisms.

Dogmatism and dishonesty are the chief points Mr. Ballard charges, with an infinite variety of phrasing, against the absent Professor Now, one would really be disposed to see something in the first point, since it is so persistently urged by Haeckel's critics Unfortunately, when one looks closely into the grounds of the charge it begins to totter, and when one compares Haeckel's words with those of his critics, one wonders what dogmatism really is There is, for instance, that admirable writer of the *Christian World*, Mr J Brierley ("J B."), who stooped in some unguarded hour to attack Haeckel. The *Riddle* is "one of the most amusing books this generation has seen" because "its dogmatism is so naive" "Professor Haeckel has found everything out," says Mr Brierley "He has exploded the old mystery, and found it a bag stuffed with sawdust There is nothing to wonder at in suns and systems They are just matter and force, and there is an end." Now, the *Christian World* is a fine paper, and "J B" is one of its sanest contributors, yet this passage is astounding Whence did a hostile reviewer in the *Sheffield Daily Telegraph* get the opposite impression that Haeckel "is modest and unassuming in the claims he makes for his system"? How came the *Westminster Review* to call it "a careful and conscientious endeavour to construct a theory of the universe in harmony with the teachings of modern science"? Read the second page of the preface to the *Riddle* "The studies of these world-riddles which I offer in the present work," you read, "cannot reasonably claim to give a perfect solution of them, they merely offer to a wide circle of readers a critical inquiry into the problem, and seek to answer the question as to how nearly we have approached that solution at the present day What stage in the attainment of truth have we actually arrived at in this closing year of the nineteenth century? What progress have we really made during its course towards that *immeasurably distant goal*?" Those words—and you will vainly seek their equal in modesty in any religious riddle-solver in the world—meet the eye at the very opening of the book, and they are substantially repeated at its close (p 134)[1] "The answer which I give to these great questions," Haeckel continues, "must naturally be merely subjective and only partly correct." Was there ever so singular a "dogmatist"? "The one point that I can claim is that my Monistic Philosophy is sincere from beginning to end" "My own command of the various branches of science is uneven and defective, so that I can attempt no more than to sketch the general plan of such a world picture, and point out the pervading unity of its parts, however imperfect be the execution" "In taking leave of my readers, I venture the hope that, through my sincere and conscientious work—in spite of its faults, of which I am not unconscious—I have contributed a little towards the solution of the great enigma." If that is dogmatism, and the average theological pronouncement is fragrant

[1] I quote throughout from the cheap edition of the *Riddle*

with modesty, we shall need to reconsider our moral terminology [1]

But Mr. Ballard would tell us there are other passages in which "the most arrogant dogmatism" breaks out Well, Haeckel has told us the book is uneven and sketchy, that its parts were written at different times, in different moods, and, knowing there was no inconsistency of thought, he may have trusted to the intelligence of his readers to adjust any mere inconsistency of expression But the truth is, that Mr Ballard's choice examples (given in his third article) of "unmitigated dogmatism" are little short of ridiculous "Thus we have got rid of the transcendental design of the philosophy of the schools" and "The unprejudiced study of natural phenomena reveals the futility of the theistic idea" are two of the shorter quotations Clearly, Mr. Ballard must mean that Haeckel should have interposed "in my opinion" in these sentences. Does Mr. Ballard do that? Does any sane and literary writer do it who expects to have intelligent readers? Professor Haeckel is by no means a Social Democrat, but he does credit "the general reader" with intelligence enough to relieve him from saying "this is my opinion" at every third line. He has gone out of his way to warn the reader from the beginning that his conclusions are "merely subjective" In not one of these cases does he represent a conclusion as being unanimously accepted. On the contrary, Mr Ballard and his friends are never tired of pointing out how Haeckel, *on his own showing*, is contradicted by his own colleagues in Germany. The whole matter is too absurd to prolong. Haeckel's "dogmatisms" are the ordinary ways of expression in adult literature. They shine with modesty in comparison with theological utterances, and they are guarded from misinterpretation on the part of the uninformed by a most rare and conscientious warning in the preface.

Finally let us consider the charge of misinterpretation, trickery ("jugglery," the Rev. Rhondda Williams says), and general dishonesty of method To deal with this fully would be to anticipate my whole book here, the reader will be amply informed for judgment in the sequel. But we may, in the meantime, profitably run our eye over Mr. Ballard's twelve columns of moral censorship. In the last chapter of *Miracles of Unbelief*, Mr Ballard says "we find misrepresentations so gross and glaring as to make it extremely difficult to credit the writer at once with mental ability and sincerity" (p. 350). In immediate justification of this, Mr. Ballard quotes Haeckel's statement (p 46 of the *Riddle*) that even some Christian theologians deny the liberty of the will. This Bachelor of Divinity seems unaware for the moment that the Calvinists notoriously denied freedom on the very ground indicated by Haeckel, and that the greater part of the Catholic theologians (the Thomists and Augustinians) are accused by their colleagues of being, logically, in the same predicament. A more paltry justification for so grave a charge it would be hard to conceive. The only other point in the chapter worth noting is the comment on abiogenesis, and this will be met at a later stage.[1] I turn to the pages of the *British Weekly*, and their blush of righteous indignation

The only point that concerns us in

[1] An amusing feature of this delinquency of Mr. J. Brierley's—which I sincerely regret to have to notice—is that it follows upon a fine article on "Candour in the Pulpit"—that is to say, on the lack of candour in the pulpit and of honesty in apologetic literature. So that, almost side by side with this unhappy passage, one reads "A foremost modern theologian, by no means of the radical school, has recorded his significant judgment that one of the main characteristics of apologetic literature is its lack of honesty; and no one who has studied theology can doubt that it has suffered more than any other science from equivocal phraseology" (*Christian World*, August 20th, 1903; p 10)

[1] But the many admirers of Mr Ballard who wish to know the worst at once may refer now to p 40, and see how their apologist garbles his quotation from Haeckel, misrepresents his position, misstates the attitude of science, and so wins a glorious victory—over the Decalogue.

the first article is a curiously spirited attack on my opinion that the *Riddle* is "unanswered because it is unanswerable," and it is instructive to consider this Take down your copy of the *Riddle*—do not contract the slovenly and expensive habit of trusting a controversial writer, and I will give you pages throughout, which Mr Ballard never does—and notice that I wrote this in November, 1902. Mr. Rhondda Williams had not then written his pamphlet, Dr. Horton had not preached his sermon, and Dr Loofs's book was unknown in England The only "reply" in the field was a hastily added chapter to Mr Ballard's *Miracles of Unbelief*, which one may be pardoned for not having discovered by 1902 Further, I wrote with pointed reference to Dr Beale's pathetic promise of a reply in the agony column of the *Times*, Oct 1st, 1900, a promise which he withdrew by referring later (Dec 19th) to a tiresome collection of letters from the *Lancet* which he had published in 1898 Moreover, I pointedly wanted an answer to the most important thesis of the book, the evolution of mind, which, I find, even Mr Ballard had not met Mr Ballard's selection of spontaneous generation as the chief point—whereas Haeckel only offers it as "a pure hypothesis," and it is only an incidental (though necessary) consequence of his system—is unworthy of a serious scientific man So, brushing aside criticisms of Haeckel's views on Christ and the Immaculate Conception, which have nothing to do with the integrity of his system, I deplored "the silence or triviality of his opponents" But note how Mr Ballard manipulates this innocent observation Premising that I am "doubtless honest," and that "the apostles of free-thought, of all men, might leave others free to think for themselves," and so on, he tells me it was answered by himself (in an obscure corner of an obscure book) and —by anticipation! That encourages him to call my statement an "untruth"

In the second article my enormity grows Readers are told that I assert the "monistic mechanism 'has been for ever established' as the all-sufficient origin, means, and end of everything", whereas I most clearly said only that "the case for the evolution of mind" had been "for ever established" Later we have a reference to "the reactionary assurances of an ex-ecclesiastic to the effect 'that all Christian faith is shipwrecked and all Christian convictions amongst the breakers'" The unsophisticated reader will learn with surprise (in spite of "to the effect") that this, whether reactionary or not, is not a quotation from me And finally the growth is complete, and I am made to "sneer at the triviality or the silence of the opponents of the mechanical theory of the universe" Mr Ballard, F R M S, clearly makes a very improper use of his microscope at times

So it is with my innocent remark that in the *Riddle* we have a "masterly treatment of the question of the evolution of mind" "Masterly" soon grows into "more masterly," and Mr Ballard airily asks. "I really want to know *why*, for some of us who make no profession to be experts, Dr Haeckel's treatment should be more 'masterly' than that of, say, Dr Wallace"; and in the end "May we not then ask Mr McCabe, or Mr Blatchford, why, or by what authority, they proclaim that Prof Haeckel's treatment is so much more masterly than that of all others as to foreclose the question?" The perversion of my phrase into a comparison and the implication that I fail in respect for Dr Wallace or any other distinguished thinker come very oddly from the pen of this literary *censor morum*

Yet this is a fair sample of Mr Ballard's procedure—and is in fact a great part of his procedure, or I should not have dwelt on it The only other important element in Mr Ballard's preliminary twelve columns is his industrious collection of authorities to

oppose to Dr Haeckel I shall speak presently of the proper merit of this, but must touch a few points of it here to finish the consideration of Mr Ballard's standard of controversy He constantly affirms that Haeckel is opposed by the majority of scientific authorities We shall see what this really amounts to, but let us consider it here in the light of the more important question whether they support Christianity I have carefully examined the list of writers quoted against Haeckel by Mr. Ballard, and this is the result In the front rank are the three eminent scientists, Lord Kelvin, Sir O Lodge, and Dr A R Wallace Their convictions every man will respect who respects himself, but—two of them are Spiritists (having therefore, an alien and empirical source of faith, and holding views on the future state which Christian teaching rejects), and Lord Kelvin gives a very slender support, as we shall see Then there are Dr Beale (who confesses in his latest book that he is fighting a vast majority), Dr Croll (who denies the liberty of the will), Dr Stirling (whose contribution is the same as Dr Beale's), Dr. Winchell and Sir J W Dawson (geologists of a past generation, who defend the literal interpretation of i Genesis Sir J W Dawson thinks geology only claims 7000 years for the life of man, and that "the deluge is one of the most important events both in human history and the study of the later geological periods"), Professor Flower (with ten lines of qualifications, but whose only contribution to the subject seems to be an address at a Church Congress, in which he sharply tells the clergy they have done mischief enough in the past, and had better leave evolution to men of science, two short phrases about an "eternal power" and the "Divine government of the world" seem to constitute his slender theology), Dr A Macalister, Professor Le Conte and Mr Fiske (American evolutionists and Pantheists), Mr Row (the Christian Evidence lecturer), Dr Cook (the American Christian evidence lecturer), and Lord Grimthorpe (the Vicar-general of York, whose "legal and scientific mind" may be seen at work in his *Letters on Dr Todd's Discourses on the Prophecies*) The rest of Mr Ballard's list consists of professional theologians "Dr" This, and "Professor" That, usually turn out to be graduates in divinity I am not for a moment slighting the scientific acquirements of men like Dr Dallinger, Mr Newman Smyth (one of the few apologists who retain the character of a gentleman amidst polemical work), Dr Iverach, Mr Ballard, Mr Profeit, and Mr Kennedy, I am not so unintelligent But it would be absurd to say that the publications of these professors of apologetics and doctors of divinity have the same value, as replies to Haeckel, as those of scientific laymen The result is that Mr Ballard's list is totally and gravely misleading to the uninformed Rubbish like the "Present Day Tracts" and antiquated work like Winchell's and Dawson's and Stirling's and Wainwright's are mixed up with the good work of Newman Smyth and Dallinger and Kennedy. Evolutionists and non-evolutionists, theists and pantheists, Christians and non-Christians, are hastily thrown together He drags in Prof W James to rebuke Haeckel, the average reader will have little suspicion that James rejects the title of theist, speaks scornfully of Mr Ballard's God, and is not sure of the immortality of the soul All this is gravely misleading

Clearly, Mr Ballard's ideal of controversy is not much superior to that of Dr Horton Yet this budding controversialist has the effrontery to tell Haeckel that "if he has no sense of shame, then we have a sufficient object lesson as to the failure of 'monistic religion' to develop even an elementary degree of morality" This is provoked by statements which Haeckel quotes with transparent honesty from writers named in his book We have seen how an equally coarse outburst was prompted by a statement (as to the free-

dom of the will) which is literally correct The only other specific criticisms offered by Mr Ballard relate to the nature of matter and the origin of life In both cases he gives a mere travesty of Haeckel's position. We shall take them in detail later (though the reader may find them at once by means of the index, if he desires) For the present we take our leave of these graceful guardians of the taste and ethic of controversy

"What sort of an age do we live in?" asked the *Prager Tageblatt*, when it saw the clerical and scientific Lilliputians of Germany shooting their insults at the distinguished scientist We are living, still, in an age when religion is made to consist essentially in certain speculations about the nature of the universe, which were framed, in substance, thousands of years ago, an age when any independent speculator on the nature of things must expect to arouse a bitter antagonism if his conclusions differ from those of religious tradition. Religion is, in a most important aspect, "a cosmic doctrine," to quote the words of Mr Mallock "Religion and science," he says, "touch and oppose each other primarily as rival methods of explaining the .... universe taken as a whole, man forming part of it" Until a short time ago theologians held that their particular cosmic speculations had the distinction of a supernatural origin, and they damned people who called them into question To-day the gilt is wearing off the legends of Genesis, but the hereditary spirit of intellectual arrogance goes more slowly To-day there are many theologians who call themselves truth-seekers, and there are a few who write and speak as if they *were* truth-seekers, and not truth-fulminators But the sad truth is that the majority are morally hampered by a conviction of the sacredness and the exclusive truth of certain speculations, about God and the soul, which they have a corporate charge to defend Every man who opposes them is constructed into a hater of their religion and a menace to human progress. The diminution of their followers seems only to increase their violence "Already," says Mr Rhondda Williams, "it is the fact that the cultured laity on the one hand and the bulk of the democracy on the other are outside the Churches"[1] Yes, people are seeking the truth, out in the light of day, and they distrust a tradition that has broken down section by section as the century advanced Haeckel, starting from a most comprehensive knowledge of living nature, has reached out to certain conclusions on the cosmic mystery It will not avail to caricature his conclusions and vilify his person and motives and method Neither he, nor his translator, nor his publishers, dreamed of thrusting his zoological authority down people's throats, except in so far as his book deals with zoology His further conclusions must be met on their argumentative merits His whole system must be judged by rational evidence Dust-throwing and mud-throwing are not the methods of truth-seekers, they are the devices of timid or foolish partisans

But before I enter upon a systematic examination of Haeckel's system and the criticisms it has provoked, I wish to expose one further misrepresentation of a general character Almost all the critics endeavour to make us distrust Haeckel by attributing to him a solitary and isolated position in the scientific world Even if this were the case, it would only be an incentive to examine his views with the greater care Copernicus stood alone throughout life Darwin was opposed by most of the scientists of his time Wolff enunciated a profound truth which was not accepted until long after his death Robert Owen preached a whole series of social truths that we all accept to-day Further, all writers do not regard Haeckel as isolated Mr Mallock, in his *Religion as a Credible Doctrine*, not only takes him to be the supreme living representative of scientific philosophy, but says that he and his

[1] *Does Science Destroy Religion?* p. 29.

colleagues "are correct in their methods and arguments—that the attempts of contemporary theologians to find flaws in the case of their opponents, or to convert the discoveries of science into proofs of their own theism, are exercises of an ingenuity wholly and hopelessly misapplied, and exhibit too often an unreasoning or a feverish haste which merely exposes to ridicule the cause which they are anxious to defend."[1] Dr. Lionel Beale speaks throughout his *Vitality* of the majority being on Haeckel's side in that controversy. Dr. Iverach speaks in his *Theism* of "scientists," in a general way, as refusing to go with him. But the misconception it is particularly needful to clear up is as to the relation of Haeckel's Monism to Agnosticism. When Mr. Ballard speaks crudely of the majority of modern scientists being opposed to Haeckel, the uninformed will conclude that they are, therefore, more or less with Mr. Ballard. We have corrected that impression by giving the list of all the scientific laymen of England and the United States, of recent years, that Mr. Ballard has been able to get under one very broad religious umbrella. It bears only a small proportion to the whole, even when we have added Professor Henslow and a few more later on. On the other hand, the average educated man would say that Haeckel is a materialist and atheist, and the great bulk of our men of science reject both names. Haeckel, it is true, equally rejects the name materialist, but we may defer that point to the next chapter. Our average educated man has no illusion as to Huxley, Tyndall, Clifford, Darwin, Bain, Sully, Maudsley, Spencer, Ray Lankester, Karl Pearson, and scientists of that type (or those types) favouring what Mr. Ballard would call religion. These have professed Agnosticism; and the silence on the religious question of the vast majority of our scientific men must—especially in view of the feverish alertness of the Churches to drag them on to platforms when they are known to be in the least favourable—I should say, be construed in the same sense.

Now, Agnosticism is held to be more or less respectable. Mr. Ballard quotes Huxley and Darwin and Tyndall with a light heart and without the least recourse to his red ink. Haeckel is abused because of his "dogmatism." But let us refrain from raising dust, and see what the difference really comes to. I might quote Lord Grimthorpe, whose "legal and scientific mind" Mr. Ballard has warmly recommended to us: "As for professing to believe neither alternative, atheism or theism, . . . that is not only probably but certainly wrong, and, indeed, is so impossible that any man who thinks he has come to that conclusion is mistaken, and is at present an atheist."[1] But I think a writer of that type ought to be left in his grave. Listen, however, to what one of the ablest living thinkers of England says on the matter: "The Neutral or Agnostic Monism now in vogue amongst scientific men . . . is scientifically popular mainly because it is still essentially naturalistic, and disparages the so-called psychical aspect as epistemologically subordinate to the physical. . . This monism escapes the absurdities of the old materialism more in seeming than in fact . . . it is materialism without matter. . . . In this monism the mechanical theory is still regarded as furnishing a concrete and complete presentment of the objective world. . . If dualism is unsound, there seems to be no agnostic resting-place between materialism and spiritualism."[2] I do not subscribe to all this, but the high authority of the writer encourages me to say that the custom of opposing our

[1] *The Fortnightly Review*, September, 1901; p. 400.

[1] At the close of *The Origin of the Laws of Nature.*

[2] Professor J. Ward, *Naturalism and Agnosticism*, p. 207, vol. ii. So Professor Case, in the article on Metaphysics in the tenth edition of the *Encyc. Brit.* says Huxley, Tyndall, and Spencer, only escape materialism by being inconsistent,

Agnostic scientists to Haeckel—especially when fairly ancient quotations are dug out of their works in support of it—is totally misleading.

The difference between them is this (setting aside for the moment the question of idealism): Haeckel's system is a comprehensive theory covering the universe, whilst they remain on ground which they feel to be very solid. They affirm the evolution of all things, of matter, of solar systems, of species from lower species, of man, of religion and ethics. But they decline to skate at all on thin ice. Whether the universe had a beginning, whether evolution has been purposively guided, whether or how life arose out of non-life, whether consciousness is of the same texture as physical force, whether death makes an end of it—all these things they prefer to leave to a later generation. Where they do *affirm*, they agree with Haeckel; but they consider his further affirmations premature, to say the least. They agree with him that the religious theory is quite uncalled-for by the facts of science; but they think it too early to frame counter-theories. This is the real significance of those famous conversions of German scientists of which every critic of Haeckel has made so much. Du Bois-Reymond, Virchow, Baer, and Wundt spread their affirmations over the universe in their younger days. At a later period they restricted themselves, like Huxley or Darwin, to positions which seemed impregnable. They retreated to Agnosticism on the more advanced questions. It is absurd to find Haeckel's critics representing them as having gone over to theism or Christianity.[1] Like Huxley and Tyndall (in his agnostic mood) they only decline to follow Haeckel in a constructive theory of the origin of life and the relation of consciousness to brain, and the strenuous denial of God and immortality; but they shrink just as severely from the constructive theories and the dogmas of Haeckel's critics.

In that sense Haeckel stands apart, though far from alone. Is he justified in leaping the abysses from which his colleagues shrink? Would it be wiser to keep to the solid ground? To put no rounded system before the world? We can judge best when we have covered the whole ground over which his system extends. Meantime, remember three things which are lost sight of in the dust of this controversy. Firstly, Dr. Haeckel does not claim anything like equal value for his views on all points. He knows perfectly well how the evidence differs, and how at times he must bridge a chasm with "a pure hypothesis," as he calls his theory of abiogenesis; though he does not even put out a hypothesis without sober ground. His system is an elaborate structure of demonstrated truths, convincing theories, and rational hypotheses of all grades of strength. The critic who confuses the latter with the former, and thinks he has destroyed "the fundamental axiom," when he has only shown that some outlying hypothesis *is* only a hypothesis, does not evince much discernment or a scrupulous desire to let truth prevail. Secondly, dualism, or theism, may not logically rush in if one

[1] Haeckel is read a ferocious lesson in manners by all his critics for putting a certain construction on their change. Let it stand. I am chiefly concerned with the truth or untruth of his ideas. I see, therefore, a far more grievous sin in the almost general misrepresentation of the nature of these "conversions." Dr. Horton, we saw, slipped in Vogt and Büchner, the most advanced materialists of Germany, as converts to spiritualism. Mr. Ballard inserts Romanes, of whose conversion Haeckel was totally unaware when he wrote the book, and whose change of views differs *toto cœlo* from that of Virchow or Wundt. All essentially misstate the real "metamorphosis." It was merely from dogmatic monism to what Dr. Ward calls "agnostic monism." It lends no support to theism or spiritualism. Prof. Haeckel assures me that "even to-day these men are styled *atheists* by German ecclesiastical writers." Read Mr. Kennedy's attack on Du Bois-Reymond's heterodoxy, after his "Ignorabimus-Rede," in his *Natural Theology and Modern Thought*, pp. 42-65. Darwin used stronger language about Virchow than is to be found in the *Riddle*.

of Haeckel's particular hypotheses breaks down. Between Haeckel and Martineau or Fiske lies the broad region of neutral or agnostic monism. And thirdly, this is the ordinary procedure of science. It throws out the light bridges of its hypotheses far in advance of its solid march. They *may* be withdrawn later. More probably they will gather strength as the years roll on, and be at length absorbed in the growth of the impregnable structure of scientific truth.

CHAPTER II

THE UNITY OF THE WORLD, AND THE LAW OF SUBSTANCE

WHAT, then, is this monism which has aroused so much bitterness and antagonism? Once more, before we can proceed to a sober and patient study of the position of Dr. Haeckel, we find it necessary to lay the dust which his critics have raised. There is the definition given by the Rev. Ambrose Pope, who seems to have led the opposition to Haeckel in the Clarion controversy. Mr. Pope disposes of the system—which it has taken Dr. Haeckel a laborious life-time to construct—with a marvellous and quite papal facility. It was made, he thinks, during three "half-day excursions" out of Haeckel's own province. From these he returned with certain "assumptions" which contain, with almost ludicrous clearness, the conclusions he wanted to reach. We will have a word on these "assumptions" (which are really the *conclusions* of years of observation and reflection) when the time comes. But incidentally Mr. Pope defines monism, or, as he calls it for some occult reason, "physiological monism." "Briefly," he says, "the universe is not dual in its ultimate nature, viz., spirit (or soul) and matter; but single (monistic), viz., matter (or substance)." Mr. Pope goes on to say airily that "this is another of those innocent-looking hypotheses" from which Haeckel derives his atheism, &c. How any man can fail to see that this is not an assumption, but the most laboured conclusion of Haeckel's system—not the base but the apex of his pyramid—passes comprehension. Meantime, it is formulated in utter defiance of Haeckel's words, and one might think Haeckel would be consulted on the matter. He says (p. 8) that monism does "not deny the existence of spirit, and dissolve the world into a heap of dead atoms" and that "matter cannot exist and be operative without spirit, or spirit without matter." Dr. Horton and many others have the same confusion. The Rev. Rhondda Williams says: "He recognises that there is something which is not material (spatial) which we may call mind, or soul, or spirit. But if this spiritual something is treated as the mere product of matter, or the mere function of the material organism, its reality is denied, *i.e.*, it has no real spiritual nature." But Haeckel has nowhere said that spirit (or force) is a product of matter. There are scientists who resolve matter into force, but no one ever attempted the reverse, except in

the sense of reducing force to motion, which Haeckel certainly does not.

Monism is so clearly defined at the very commencement of Haeckel's book (p. 8) that these gentlemen must have convinced themselves he gave an improper definition in order to escape the odious label "materialist." Before we proceed, let us be perfectly clear why this odium does attach to the word "materialism." It is well worth while, for here is one of the strangest and most common sophisms of the hour. Materialism is the name for two totally different things, which are constantly confused. There is, in the first place, materialism as a theory of the universe—the theory that matter is the source and the substance of all things. That is (if you associate "force" or "energy" or "motion" with your "matter," as every materialist does) a perfectly arguable theory. It has not the remotest connection with the amount of wine a man drinks or the integrity of his life. But we also give the name of materialism to a certain disposition of the sentiments, which few of us admire, and which would kill the root of progress if it became general. It is the disposition to despise ideals and higher thought, to confine one's desires to selfish and sensual pleasure and material advancement. There is no connection between this materialism of the heart and that of the head. For whole centuries of Christian history whole nations believed abundantly in spirits without it having the least influence on their morals; and, on the other hand, materialists like Ludwig Büchner, or Vogt, or Moleschott, were idealists (in the moral sense) of the highest order.[1] Look around you and see whether the belief or non-belief (for the Agnostic is in the same predicament here) in spirit is a dividing-line in conduct. There is no ground in fact for the confusion, and it has wrought infinite mischief; while it has rendered, and still renders, incalculable service to conservative religion.

In his *Natural History of Creation* Professor Haeckel admitted that his monism was not far removed from scientific materialism. But there is still so gross a confusion on the subject that it is very natural for him to refuse the name. Indeed, he could not logically accept it, and no one who is well informed in recent physics will accept it, unless he is allowed to interpret it in his own way; a right which seems to be denied to men like Dr. Haeckel. Glance at any scientific work, and you will find that it speaks as much, if not more, about force than about matter. Hence if critics insist on calling materialism a belief in "dead atoms" and "hard atoms," and "solid atoms," and nothing else, there are no materialists to-day, if ever there were? We shall see more presently about modern notions of matter and force, but may take it that Haeckel, in proper scientific spirit, attaches as much importance to force as to matter, and does *not* make any absurd attempt to derive force from matter.[1] Further, he identifies "soul" or "spirit" with force. Mr. Williams says this is a polite way of denying its existence, and Mr. Pope would say it is an assumption. It is neither one nor the other, but a most serious and characteristic conclusion of Haeckel's researches. I am now stating his position, not the grounds for it (which will come in due time). He concludes that the thinking and willing force in man—what we call his mind or spirit—is identical with the force that reveals itself in light and heat. In other words, he is forced to think that spirit and energy are one and the same thing, and so he uses the names indiscriminately. But he is further convinced, on grounds we shall see presently, that matter and spirit (or

[1] See sketches of their lives in *Last Words on Materialism*.

[1] Yet even the writer of the article on Metaphysics in the 10th edition of the *Encyclopædia Britannica*, who devotes two columns to the *Riddle*, joins in this general misrepresentation.

force) are not two distinct entities or natures, but two forms or two aspects of one single reality, which he calls the fundamental substance. This one entity with the two attributes, this matter-force substance, is the sole reality that exists—to use a Greek word, the *monon*—the one nature that presents itself to our contemplation in the infinitely varied panorama of the universe.

This position is logically, as I said, the culmination of Haeckel's system. For the convenience of this brief description I take it as the starting point of that network of explanations, theories, and hypotheses which constitutes the monistic philosophy. There is a most important school of philosophers who will challenge even the existence of this matter-force substance, as we shall see presently, but for the vast majority of men of science, as well as of ordinary folk, this matter-force element is the one obvious reality. In this Haeckel's critics are at one with him. It is when Haeckel goes on to say it is the *sole—mon-on*—reality that the conflict begins. The view which Haeckel opposes is that there is another element in existence, totally distinct from this matter-force reality: that the mind of man cannot be an evolution from the matter-force substance, and that this substance itself could not have evolved into the orderly universe about us except under the guidance of a still higher intelligent principle, God. Now, it would be quite legitimate to say that we are as yet so imperfectly acquainted with this matter-force reality that it is premature to say what it can or cannot do. That is the Agnostic position, rejecting alike the dualist theory of Mr. Ballard and the monistic explanations of Dr. Haeckel.[1] But monism is more ambitious. Science has now amassed enormous quantities of facts concerning every part and aspect of the universe. The monist believes we can already, with this material, sketch in broad outline, at least, the upward growth of the great world-substance until it is transfigured in the beauty of the living organism, and becomes self-conscious in the mind of man. Everybody admits to-day, says Mr. Mallock, that the inorganic world is "an absolute monism." The monist proceeds to bring the realms of life and consciousness into this matter-force unity, and to show that we are not warranted in claiming that its growth needs a designer or a controller. He will go on until he has embraced the whole life of humanity, science, art, religion, and ethics, in his single formula.

Do not misunderstand me to the extent of supposing, as so many strangely do, that the monist is bound to have a theory ready for every phenomenon under heaven. We find even the ablest of Haeckel's critics claiming that monism breaks down here, or fails to explain there, and then with a chant of praise fluttering the banner of dualism in the breach. Such a course is absurd. If the monistic theory fails anywhere, the next attitude that logic enforces is agnosticism, or reserve of judgment. If Haeckel's theory of the origin of life, or of heredity, or of consciousness, or of morality, or of Christ, will not stand the strain of rational examination, this does not impair the general system of monism. The heart of the system is (1) the affirmation that a great matter-force substance (or nature) is unrolling its potentialities in the universe about us (which no one denies), and (2) that we have no rational evidence that there exists any other substance (or super-nature). To say that Haeckel is bound to explain everything or die, is a grotesque assumption. He has plainly disavowed so foolish an ambition. It may be that before the last red rays of our dying sun fall upon the eyes of the last of our race, some millions of years hence, the mon-

[1] But I must repeat—so persistent is the misrepresentation—that this agnostic position is as antagonistic to Christianity as monism is. Its quarrel with what it calls the premature theories of the monist is a purely scientific or philosophical matter, and is totally unconnected with religion.

istic philosophy will be complete. That is the "infinitely remote goal" he spoke of. But, as I said, science has already accumulated so vast a library of knowledge that we may venture even now to draw the outline of an extensive view of the universe in the monistic sense. That is what Dr. Haeckel does in the *Riddle of the Universe.* He has spent half a century in seeking truth. He has fought side by side with the finest scientific thinkers of the last century in overcoming an historic resistance on the part of the Churches. No one who is not convinced that humanity has already, at the very beginning of its higher life, reached the final truth, will be diverted by the sneers and gibes of heated partisans from a patient study of his conclusions. No one who believes that truth is a sacred possession, and the first condition of lasting progress—no one who feels that dignity and sincerity are the first qualities required in its pursuit—will allow himself to be turned from the true and vital issues by a petty and frivolous criticism of irrelevant details.

The plan I have adopted is to state first the almost undisputed unity of the inorganic world, then proceed to consider its evolution, and pursue the process of development through the successive stages of life, consciousness, and reason. But I have already said that an important group of philosophers challenge our right even to the inorganic world as a base of operations. Age after age philosophy has rung the changes on the familiar bells—materialism, idealism, spiritualism, realism. To-day the system in favour in the schools is idealism. According to the idealists the naïve belief of the average man that he lives in a material universe, which lay here in space before humanity began to furrow its soil, and will lie there still when the last man has dropped into his eternal tomb, is a delusion. The arch-sophist, Berkeley, comes along, and explains that the orange he thinks he is vulgarly injecting into a material cavity he calls a stomach, is only a bundle of sense-impressions which he quite gratuitously supposes to be caused by a material object, and his stomach is a fiction. So with the whole of material life. It is a kinematoscopic display in the mind—not, as far as we know, taken from life. Berkeley opined that God was the operator of the instrument. Idealists generally have dispensed with the operator now. The show unwinds itself by some occult law of the mind. In either case "this too, too solid flesh" *does* melt, and thaw into something thinner than "an everlasting dew." Matter is a mental construction, force is the same, the world they make up cannot be otherwise. There is, of course, the agnostic position, that we do not know whether this kinematoscopic panorama is a photograph, or a diagram, of a real world, or no. But all idealists, and they are the vast majority in philosophy to-day, sternly insist that the matter and force which the scientist manipulates are mental counters; that he is dealing with *his idea* of matter and force, whether or no an eternal reality corresponds to these. Hence it is that so many cultivated reviewers set aside Haeckel's system with polite disdain. His realism—his habit of talking of matter and force as familiar objective realities—is too naïve.

Now this philosophy so obviously cuts out the root of Haeckel's system that some of his clerical critics have put on superior airs and borrowed phrases from it. If the very existence of matter and force is doubtful, clearly monism is in a parlous state. They forget one thing. If idealism excludes, or throws doubt on, the objective reality of matter, it in the same proportion destroys the Christian position. What is the meaning of the Incarnation, or the death of Christ, or the whole historic foundation of Christianity, if the material world and its history are subjective? Dr. Iverach sees this very well, and warns his impetuous colleagues. "In truth," he says, "we must arrive at a conception which leaves room for real individuality; that will

recognise the uniqueness of every person, and yet place every person in relation to every other person and thing that is, has been, or will be. It must allow reality to history, and permit a real progress and real events in it. It must recognise human activity as a factor in the world's history, and recognise somehow that good and evil, happiness and misery, righteousness and sin, are not appearance, but stern realities, which philosophy and theology must deal with."[1] There are, of course, important divines amongst the idealists, such as Dr. Caird, but they are neither consistent nor likely ever to be literally adopted. The Catholic Church is intensely realistic. Its philosophers, Dr. Ward, Dr. Mivart, Father Maher, Father Clark, etc., have never yielded a step to the reigning fashion of idealism. In a word, the defenders of religion whom Haeckel opposes are as "naïve realists" as he is. It is only the more short-sighted who meddle with the edged tools of the modern metaphysician.

But the philosophers themselves, the aristocracy of the intellectual world! Are we to go on with our construction in total disregard of their protest? I believe Haeckel is quite right in doing so. As Mr. Mallock says, these idealist dreams are not "the mere raving which at first sight they seem to be." On the other hand, the common fashion idealists have of saying that the man who refuses to take them seriously must be altogether ignorant of their philosophy—a species of arrogance peculiar to idealists and Roman Catholics—is absurd. Few cultivated men are ignorant of their arguments. But the average man of science, the average historian, and the average man of affairs, sweep away their theory as, in the words of Mr. Mallock, "a fantastic, though ingenious and learned, dream.[2] "If philosophers," he says again, "instead of confining themselves to the solemn altitudes of existence . . . would condescend to take their examples from the common events of life, they would avoid many of the mistakes which expose them to the just ridicule of the vulgar." The historian is hardly likely to admit that the stupendous drama he is engaged in reconstructing is not the real play of living passion. The astronomer is not prepared to see in the vast expanse of the heavens only the unreal mirage of his ideas. The physicist contemptuously repudiates the idealist's interpretation of his matter and force. The question is raised, said Sir A. Rücker, in his presidential address to the British Association in 1901, "whether our basic conceptions are to be regarded as accurate descriptions of the constitution of the universe around us, or merely convenient fictions," and he gave an emphatic adhesion to the former. His speech ended with a claim that ether and the atom are not mere mental fictions, not mere "working hypotheses," but "objective realities." His successor in the presidency, Professor Dewar, no less strongly repudiated "the ancient mystifications by which a certain school shatter the objective reality of matter and energy." Indeed, signs are not wanting of a coming change amongst the metaphysicians themselves. The immense difficulty of explaining how we can perceive an external world is familiar enough to every thinking man. But philosophy must try again. The material world is more convincing than all their difficulties. The article on "Metaphysics," by Professor Case, in the latest edition of our greatest Encyclopædia is one long warning that the reign, or the nightmare, of idealism is over, and that we shall shortly return through "the anarchy of modern metaphysics" (as he says), to a normal belief in the reality of a material world, the reality of war and disease and poverty and ignorance, and the rationality and validity of social enthusiasm and scientific investigation.

With Professor Haeckel, then, we pass

[1] *Theism in the Light of Present Science and Philosophy*, p. 305.

[2] *Religion as a Credible Doctrine*, p. 202. Mr. Mallock gives an admirable summary of the system, as presented by its latest and ablest expositor, Professor James Ward.

by our perplexed metaphysicians, and smile at their supercilious comments. We turn to the spreading panorama of inorganic nature as the first embodiment of the monistic substance.[1] There should be no criticism for us to meet here, but the eagerness to deny and to discredit and to score a point—as if we were conducting a mimic Parliament in some dull provincial town, instead of being sober searchers for truth—has been so feverish that we shall find it breaking out into all kinds of frivolous criticisms.

When you look up at night into the heavens you see some three or four thousand stars scattered through space. Each is an incandescent sphere, rarely less than three million miles in circumference, and usually separated from its fellows by billions of miles of space. It would take some 750,000 years to count the distance in miles to the nearest of them. Some of them can be proved to be at least 1,500,000,000,000,000 miles away. With the use of a good telescope the number of these world-masses runs up to more than a hundred millions. Yet even then we seem to be only at the fringe of the question of the magnitude of our universe. When a telescope containing a highly sensitive photographic plate is directed to what seem to be dark and empty parts of space, and is kept in that position for eight or ten hours, the plate is found to bear the faint imprint of a fresh myriad of worlds. They are so far distant that, though they are 150 times more luminous than limelight, and though the waves of light they send us have been falling on the plate—a plate that would take a picture in the merest fraction of a second in day-time—at the rate of 700,000,000,000,000 per second, many of them fail to make the least impression after six or eight hours' exposure. We have no ground for supposing our most powerful instruments bring us to anything like a limit to the universe.

Is the universe infinite? Dr. Haeckel speaks of it as infinite and eternal, and this is just one of those typical cases where the monist outruns the agnostic. The criticisms which have been passed on the phrase "infinite" (we shall speak of eternity later), as applied to the material universe, are not very discerning. There are critics who imagine that Haeckel must advance no statement for which he cannot furnish empirical proof; whereas he has told us from the first page that, as a sensible thinker, he employs his faculty of speculation (taking care that it starts from facts) as well as his power of observation. Then there are critics who insist on thinking—it is very convenient for their purpose—that he lays the same stress on every line of his system, and so cry "dogmatism" wherever the evidence is slender. We must approach the subject more reasonably. The question is, does the evidence of astronomy point in the direction of limits or of illimitableness? Philosophy has nothing to say against the infinity of the cosmos. "We have no evidence," says Dr. Ward, "of definite space and time limits; quite the contrary. . . . we certainly cannot prove that the universe as a whole is measurable and therefore finite. And when we pass to more purely *a priori* considerations, the case against a universe with fixed and finite limits is equally strong."[1] The idea of a limit is in fact unthinkable, and the evidence of astronomy is far from suggesting it. "Is the universe infinite? Who can say?" asks Dr. Dallinger. He refers to the fairly definite scheme of

[1] A certain school would have us admit that, because our conviction of the reality of the external world is incapable of demonstrative support, we should grant the same privilege to the belief in God. There is no analogy whatever. We cannot get away from our belief in the real world. The idealists themselves assume it in their arguments—as when they take the physicist's analysis of sound or light, to throw doubt on our hearing or sight. There is not a particle of this irresistibility about the idea of God. We can trace its roots and reject it without the slightest inconsistency.

[1] *Naturalism and Agnosticism*, vol. i. p. 195. Dr. Ward does not, of course, say the cosmos *is* infinite.

our milky way, but says "it may be but a complex particle in a universe of universes, stretching on for ever and ever over the bourneless immensity of the unknown."[1] Briefly, what evidence we have is totally against the idea of a limit, and that idea is so unimaginable that it would never have been suggested but for theological considerations. Dr. Haeckel prefers to rely on the scientific indications. I reserve for a separate chapter the discussion of Prof. Wallace's curious views on the subject.

The next step that science takes is to establish the unity of this immeasurable universe. There is no question to-day about the identity of the matter which composes these innumerable and widely distant worlds. The spectroscope is a more delicate analyst than the apparatus of the chemist. It has detected poison and convicted criminals where chemistry has been mute. And the spectroscope will tell us the chemical constituents of Arcturus, 1,500,000,000,000,000 miles away, as confidently as it will analyse the matter in the laboratory. It needs for its operation only a ray of light from the matter in question. We have thus learned that the material of the stars is the same as that of our earth. We may find different elements here and there; we may find matter in states we cannot detect or produce on earth. But the ancient idea that the heavens were made of a superior substance is totally discredited. From end to end of the known universe matter is one. It is also established that a more subtle form of matter, called ether, fills the interstellar spaces and penetrates into the very heart of the most solid substances. Even the apparently rigid particles of a block of iron are really swimming in miniature oceans of ether.

But this is not unity, it is a wonderful variety, some of the critics exclaim; you give us ether on the one hand and some seventy-four different kinds of ponderable matter on the other. The latter part of the objection is not now seriously urged. For years the indications in chemistry pointed towards a real unity of the chemical elements, and to-day no one has any doubt whatever that they are all multiples of some simpler form of atom. The unity of oxygen, hydrogen, iron, gold, and so on, is completely accepted. Astronomers have observed in some of the stars matter which seems to be actually in a transition stage; and physics, which has made gigantic strides of late, seems to have detected the same phenomenon in its laboratories, as Sir O. Lodge points out in his brilliant Romanes Lecture for 1903. The elements have been built up by evolution from some simpler and homogeneous substance. That is the belief of all physicists and chemists, and it is based on a mass of facts. Mr. Ballard thinks it useful, or wise, to raise the dust even here. He says (third article—not the one in which he charges Haeckel with dogmatism) that Haeckel frankly confesses—as he does—his lack of expert knowledge of physics, and adds that these "ultimate questions of molecular physics of necessity determine our conceptions of the constitution of matter, and so are fundamental to the whole of his monistic theory." This is mere dust-throwing. The *unity of matter* is a necessary part of the monistic theory, but this is given in the commonest and the finest manuals of physics as an established and accepted truth; *how* the various elements arose from one form of matter is a subject of merely speculative interest to Dr. Haeckel, and is not yet settled. But Mr. Ballard plunges deeper, and says Haeckel's confession of weakness in physics "does not prevent his recommending 'the brilliant pyknotic theory' of J. C. Vogt to the acceptance of every biologist." Then he begs the

[1] *The Creator*, p. 14. Strange to say, Dr. Dallinger immediately continues: "If that be so, we can make no useful inference from our *finite* universe": and shortly after actually infers that the world was created on the ground that it is "finite"! "What is finite begins to be, must have been caused to be" (p. 14). If Haeckel had proceeded in this slovenly fashion, what an outcry there would have been.

reader to study the stale criticisms of Mr. Stallo "before accepting the Vogt-Haeckel theory as final," and later says Haeckel "decides that the conception which best suits his purpose is the one to be generally received." He then reads a lesson on the impropriety of misleading people, and, finally, after a bewilderingly tortuous run, appeals to the expert physicists Stewart and Tait and Lord Kelvin to prove—quite irrelevantly—that there is a Supreme Being. The whole passage is too ludicrous to analyse in detail, but I must point out two things. Firstly, Mr. Ballard has no more doubt than I have of the unity of matter, which is the only serious point in question; Haeckel can fit into his system any theory of the evolution of matter that physicists decide to adopt. Secondly, Mr. Ballard quite misrepresents Haeckel's attitude towards the "pyknotic theory." He does not say "it is the one to be generally received," but says (p. 78) he "thinks it will prove more acceptable to every biologist who believes in the unity of nature" than the other theory. The foolishness of the whole episode is seen when one reflects that this somewhat old (1891) theory of Vogt's is infinitely nearer to the theories which are being discussed to-day than the "kinetic" theory which he dislikes.

The unity of all ponderable matter is, then, an accepted doctrine, but we meet fresh difficulties when we turn to ask if there is a unity of ponderable and imponderable matter (or ether). Here, indeed, we meet a critic of a friendly disposition whom it is courteous to hear. A writer in the *Reformer* says, "it will be news to most of us that the ether is the original and fundamental matter, since it is in its properties, so far as known, pretty nearly the antithesis of all we understand by material"; and he describes ether as "a material substance which has none of the properties of matter, and has most of those usually associated with spirit." Whether ether has the properties of spirit or no depends on what we mean by spirit. Theologians mean nothing like ether, but spiritists (who seem to be generally materialists unconsciously) frequently do. In any case both Sir O. Lodge and Sir A. Rücker meet the objection for us. Sir O. Lodge, in his Romanes Lecture (1903), says some physicists admit two kinds of inertia, and he himself boldly advocates the unity of electricity and ponderable matter. "An electric charge," he says (p. 4), "possesses the most fundamental and characteristic properties of matter, viz., mass or inertia." Sir A. Rücker, in his presidential speech (1901), sweeps the objection away as unphilosophical. "We cannot," he says, "explain things by the things themselves. If it be true that the properties of matter are the product of an underlying machinery, that machinery cannot itself have the properties which it produces, and must, to that extent at all events, differ from matter in bulk as it is directly presented to the senses."[1] The affinity of ether and ponderable matter is not questioned in science, whatever the actual *degree* of affinity may prove to be. And the proof is advancing rapidly. I have said that the astro-physicist finds a transitional matter in the heavenly bodies, and now the terrestrial physicist announces[2] that in his experiments with the new element, radium, he witnesses the actual break-down of the ponderable atom into a form of matter he associates with electricity. In fact, every modern theory

[1] These principles also dispose of the critic in *Light* who finds Haeckel "very uneasy" at having to fit ether into his scheme, and thinks his "annexing" it is "desperate work at this hour of the day." Seeing that the whole trend of physics has been ever since in the direction which Haeckel follows, I should say the *criticism* is "desperate work." *Light* thinks ether is "ending the old materialism" and making for spiritist monism. As I said, it depends what you mean by spirit. Religious philosophy has always meant "unextended substance." Ether is just as quantitative as the most ponderable of the elements.

[2] See Sir O. Lodge's Romanes Lecture, 1903, and the discussion at the recent British Association meeting.

of the atom implies its origin from ether, or their common origin.

Haeckel is, therefore, fully justified in taking from physics and chemistry his thesis of the unity of matter. No man of science disputes it, and it is a purely scientific question. With regard to the unity of force, there is even less difficulty. It is now notorious that the forces of the universe are interchangeable, and are regarded in physics as so many varieties (chiefly differentiated by wave-movements of different lengths) of one fundamental energy. I am not, of course, including here the disputed "vital force" and the human soul, which later chapters will discuss. But the unity of the forces with which the physical sciences deal is beyond dispute. We have thus so far simplified the visible universe as to detect beneath its kaleidoscopic variety the operation of one form of force and one form of matter from end to end of the universe. The next and final step as far as the unity of the material universe is concerned is to bring together this matter and force themselves.

Dr. Haeckel has done this by saying that matter and force (or spirit) are "the two fundamental attributes, or principal properties, of the all-embracing divine essence of the world, the universal substance." He further admits that "the innermost character" of this substance is still totally unexplored; and in the end seems to question its existence altogether (p. 134). Here, of course, the critics are active. In the first place let us examine the alleged arbitrariness of this conjunction of matter and force. It is a perfectly sound scientific and philosophic procedure. We not only know no form of matter without force, but we cannot imagine it. It could not act on our organs of perception. On the other hand, we know no force apart from matter (or ether). Force seems to be always embodied or substantiated in matter. Each is an incomplete reality; or, rather, they are two sides, or two different manifestations, of one reality. That is in full accord with scientific teaching. But what does Haeckel mean by making this reality, or substance, of which they are the manifestations, the central mystery of life at one moment, and doubting its very existence the next? A patient examination of what Haeckel says, and a little less eagerness to score rhetorical points, would have enabled Mr. Rhondda Williams and other critics to see what he meant. He warned them that the *Riddle* is a sort of "sketch-book," and they might have expected a lack of complete harmony of expression. Haeckel says (p. 134): "We must even grant that this essence of substance [more correctly, the essence of this substance] becomes more mysterious and enigmatic the deeper we penetrate into the knowledge of its attributes, matter and energy, and the more thoroughly we study its countless phenomenal forms and their evolution. We do not know the 'thing in itself' that lies behind these knowable phenomena. But why trouble about this enigmatic 'thing in itself' when we have no means of investigating it, when we do not even clearly know whether it exists or no?" The Greeks long ago started the notion that the properties or attributes of a thing were really distinct from its substance. The mediæval philosophers made them as distinct as the skin is from a potato, and so it became a general custom to speak of the essence or substance of a thing as being hidden within or underneath a shell of properties. The senses stopped short at the shell, but the intellect somehow penetrated to the kernel. Kant's critical philosophy destroyed this supposed privilege of the intellect, but substituted for the substance-and-properties idea the equally false and arbitrary notion of phenomena (qualities or attributes that reach the senses) and noumena (or "things-in-themselves," which would be food for the intellect, if it could reach them). In both cases there is the veil of phenomena, or properties (colour, sound, shape, etc.), and the veiled and inaccessible substance, or essence, or noumenon. Now, many

of us deny to-day that there is any solid ground for the distinction at all, and that is what Haeckel means. You say, he argues, that matter and force are only phenomena, and that there is an underlying "thing-in-itself." If there is, he says, it is as mysterious as ever; but I see no good reason at all for thinking that matter and force *are* a screen or veil hiding something else. They *are* the one eternal substance or reality. It is a pure fallacy to say that in ordinary experience we are dealing with a shell of properties or phenomena, and not with the realities themselves. Therefore—logic sternly enjoining us never to multiply entities without necessity—I take it that matter and force are the world-substance breaking upon our perception in two different ways.[1]

To illustrate the point further, and to meet a further class of critics, let us hear what science says about these properties or phenomena of things. Let us take the familiar ones, sound and colour. Are you unaware, we are severely asked, that science has shown these to be totally subjective? Yes, I am quite unaware; though I know perfectly well what science has done. I am writing over a green table-cloth. Science tells me that this really means that the material covering my table is of such a molecular texture that it absorbs a number of the waves of sun-light which fall upon it, and only reflects the blue and yellow waves. These it sends to my retina at the rate of some hundred billion per second: they cause a peculiar movement in my optic nerve, and finally in my brain, and—I see green. So, as I write, the clock strikes twelve. That is to say, the metal molecules of the bell are thrown into a violent oscillation; they cause waves in the surrounding atmosphere; and the intricate mechanism of the ear turns these into a modification of my auscultory nerve and brain. And all this elaborate description of objective movements and objective agencies is supposed to have made colour and sound "subjective!" In point of fact, it has done away with the old shell of properties (though it is a question how far people ever did say their sensations of colour and sound were objective) and brought us into direct touch with realities. And as all the unnumbered objects about us constitute, fundamentally, *one* matter and *one* force, we are face to face with the one fundamental reality. We do not "know all about it." That is the grossest perversion of Haeckel's words. To borrow the fine metaphor of Sir A. Rücker, we see it in a light that is still dim, but we *see it*. It is for the future to complete the outline and fill in the detail, as the light grows.[1]

Thus we have given in terms of science the world substance, the matter-force reality, which is the constructive starting point of Monism. The rest of our work consists in eliminating the additional substances or forces which theists, spiritualists, or supernaturalists would compel us to add to it. It only remains here to say a word of what Haeckel calls the fundamental "law of substance." And first as to Haeckel's idea of a "law." A fair-minded reviewer in the *Inquirer* (March 9, 1901) says: "The distinguished author seems to have failed to see that to imagine a *law* as an *active power* is every whit as 'anthropomorphic' as to imagine a God of manlike form as feeling." A writer in *Knowledge* (January 30, 1901)—from whom the *Inquirer* probably borrowed—

[1] And that is not only the literal, but the only rational, meaning of "phenomenon." Prof. Haeckel readily endorses my explanation of his position.

[1] From these principles the reader can answer for himself the often-heard criticism: You build up the universe by matter and force, but what do you really know about matter and force themselves? The answer is: Go to a good library, and ask for a few recent manuals of astronomy, geology, chemistry, physics, and physiology. If they do not deal with matter and force, they deal with fictions. The fallacy of the criticism is, of course, that science deals with this impostorly shell of "phenomena," and does not reach the "essence" or the "underlying reality."

puts it as strongly: "To scientific minds who regard laws of nature as merely conceptual formulæ summing up certain sequences of experience, it may seem that to replace a deliberate architect and ruler of the world by 'the eternal iron laws of nature' is to be guilty of an anthropomorphism precisely analogous to those on which the illustrious author pours contempt," and he says, "evolution travels through the book like a creator in disguise." It would be rather curious if one of the ablest living scientists did not know what science means by "a law." I say science, because there is here no discrepancy of views. That "law" only means "a summing-up of experience," a uniform mode of action of this or that force, is a platitude of natural science. Said Professor Dewar in his Presidential Speech: "When the scientist speaks of 'a law of nature' he simply indicates a sequence of events, which, so far as his experience goes, is invariable, and which therefore enables him to predict." But the "law," or mode of operation, of an agency is so closely connected in our minds with the agency itself that we frequently substitute the one for the other. It is strange to hear that this deceives any one.[1] When a scientist speaks of the *law* of gravitation, or the *law* of evolution, producing or compelling certain results, he invariably means the *force* of gravitation or the agencies of evolution.

We come, finally, to what Mr. Ballard strangely calls Haeckel's "irrational law of substance." The law of substance is one of the most undoubted truths of modern science. It is merely the union in one sentence of two of the proudest results of modern physics, the indestructibility of matter and the conservation of energy—which are, said the *Manchester Guardian* critic, "precisely the oldest of all man's discoveries in the cosmological field." No particle of matter is ever annihilated or created; that is the first axiom. Recent experiments have actually seen the breakdown of what has been called the "atom," and have seen particles chipped off it; but only another form of matter is produced. The observations have been so broad that physicists have felt justified in concluding that indestructibility or permanence is a property of matter. The same has been experimentally demonstrated of force.[1] Both are constant in quantity, though ever-changing in form and distribution. Since we have seen reason for associating matter and force so closely, it is necessary to combine the two axioms likewise. The great fundamental reality is constant or permanent amidst all its qualitative changes. That is the first and firmest law or feature of the monistic substance.

We have now seen that Professor Haeckel is in full accord with the latest scientific teaching in his doctrine of the unity of the visible world. We have seen (1) that matter and force are realities; (2) that there is at bottom one supreme form of each; (3) that there is no reason for holding them to be distinct realities, and so we unite them as aspects of one substance or reality; and (4) that this substance is, as far as extended observation goes, constant and indestructible in its quantity. We may now proceed to consider the evolution of this matter-force reality into the infinite complexity of the visible universe.

[1] Does any one quarrel with us for saying that "the law" compels us to pay taxes, and so forth?

[1] As to the difficulty alleged to rise from radio-action, Sir O. Lodge says there was "never any ground" for concern about the theory.

CHAPTER III

THE EVOLUTION OF THE INORGANIC WORLD

WHERE shall we begin in a description of the growth of the universe? Can we go back to a stage beyond which the imagination cannot penetrate with its ceaseless questioning? It is impossible for us to hope ever to do this. Wherever we start in our construction, we shall start with positive building material, and the imagination, if not reason, will ask endless questions about its previous history. All that we can do is to set out from a definite and recognised point, the nebula from which our particular solar system has been formed. From this, once we have traced the broad lines of the evolution of our sun and planets, we may, in the light of the discoveries and speculations of modern science, look back into the appalling abysses of past time and out over the boundless panorama of the universe.

With what is known as the nebular hypothesis we need not linger. Haeckel has sketched the outline of the theory, and there is no relevant criticism of it. "There is no doubt," says Dr. Iverach, "that some form of the nebular theory is true."[1] There are clerical writers who seem to think it profitable in some obscure way to point out defects in the theory, or to prove that the evidence for it is not overwhelming. What they gain by such efforts is not clear. The question has long since passed beyond the sphere of theology. Catholic astronomers like Miss Agnes Clerke accept it as eagerly as atheists. No man of science entertains the smallest doubt to-day that it correctly describes in outline the formation of our solar system. Once upon a time—it may have been fifty million years ago, as Dr. Iverach says, or it may have been one hundred or more, as others think—the part of space we occupy was filled with a cloud (not necessarily a "fire-mist") of infinitely attenuated matter. By the action of its inherent and natural forces this nebular matter entered upon a process of condensation and disruption. Portions of it—whether or no they were cast off in the form of rings, which broke into irregular masses—condensed into the several planets of our system, and were set in revolution round the central mass. This central mass, the sun, is still condensing and pouring out the heat which its compression causes. The smaller masses, such as the earth, cooled in time and formed a solid crust at their surface. This outline is accepted by all educated people to-day. Quibbles about the details of the process are best left to expert astronomers to deal with.

Our solar system is as a single snowflake in a shower, but we have already seen that it in every verifiable way resembles its fellow flakes. It is of the same stuff as they, and is ruled by the same laws or forces. We have undeniable ground to extend our nebular theory to other worlds than ours, and take it as the key to the formation of all the stars that fill the immeasurable heavens. Indeed, we find worlds in every stage of development, as required by the theory, when we sweep the sky at night. We find nebulæ stretching sometimes over billions of miles (as the nebula in Orion), and patches cut out of them, as it were, to form stars. We find clusters of thousands of stars (as the Pleiades) with the remnants still clinging to them of the gigantic nebula they were developed from. We find nebulæ and stars illustrating almost

[1] *Theism in the Light of Present Science and Philosophy*, p. 35.

every step of the process. We find dark stars, extinct suns, which point to the complete accomplishment of such a process. Astronomers are of late years disposed to think the number of these extinct suns is enormous. Moreover, at times a new star flames out in the sky, announcing the recommencement somewhere of the familiar drama of world-formation.

In a word, the evidence of astronomy forbids us to look upon the evolution of the material universe as a continuous process in a straight line of which we might picture a definite beginning and for which we might anticipate a definite end. The life-force of the great substance only dies down in one corner of space to be relit in another. The dark stars which indubitably have run their million-year long course are only waiting to be reanimated by collision or some other cosmic accident. The nebulæ are embryonic worlds before our own eyes. The blue-white stars are in the prime of life. The red stars (with certain peculiarities) are slowly dying, but may rise again any day from their tombs. Science, as Dr. Mivart said in *Truth*, "points to no beginning." Nor does it help us to approach the subject from another point of view. We have not only the evolution of cosmic masses to explain, but the evolution of the chemical elements themselves, or of ponderable matter, from the finer medium from which all physicists believe it has been developed. If we had any scientific evidence which justified us in going back to a stage when ether (or whatever the "prothyl" may turn out to be) alone existed; and could then show how atoms of ponderable matter arose by condensation of it, or by the formation of vortices in it; and could see these atoms being grouped into the complex atoms of oxygen, gold, sulphur, &c.; and could further trace their aggregation into meteorites, and the meteorites into nebulæ, and the nebulæ into solar systems—even then we should in reality be no nearer the beginning. The "prothyl" (or "first matter," a name which does very well to designate the much-sought elementary substance) might very well be only the last term of a previous universe-drama. The cyclic process may have gone on for ever as far as science can tell. But in point of fact the universe does not as yet give indications of any such continuous process. The universe is developed piecemeal, star by star. The hundred millions that we see shining to-day are by no means "the universe."

We have here a drama of life and death on an almost inconceivable scale, but the point I want to bring out is that even the most daring speculations of science bring us no nearer to a beginning than we are to-day. Dr. Haeckel has been roundly abused for speaking of the universe as eternal. I think it is quite clear that, if we confine ourselves to *scientific* considerations, he is using a very proper kind of language. Here is a matter-force reality which is constant and indestructible in its ultimate quantity; and though we can go back millions of years on solid evidence, and billions of years on fair speculation, we find no more suggestion of a limit in time than we did in regard to space. Certainly, the greatest number of billions of years we could imagine would not be nearer to eternity than a day is. I merely say that if any one suggests a limit in time for the cosmic process he will not find the shadow of a justification in science. Critics seem at times to employ a curious logic in dealing with this question. "Finiteness" and "infinity" are words with a strong odour of metaphysics about them. Let us take it that it is a question simply whether the universe had a beginning. Now, some critics naïvely assume that it is our place to prove that the universe, or matter, or force, or motion, never had a beginning. That is a novel kind of logic. Here is the universe given, and if any one makes the very pregnant and formidable assertion that there was a time when it did not

exist, and that it came into existence out of nothing, he must have a very positive and firm ground for his assertion. As far as scientific experience of matter and force (or motion) goes, they are not entities that slip in and out of existence, but are constant. Yet we have Mr. Rhondda Williams talking of "the mystery of the primitive push" as having always been the great difficulty of mechanism. He tries at first to make a scientific difficulty of it: "Galileo, the founder of physical science, laid it down as the first principle of dynamics, that every movement of matter could only be explained by another movement of matter, and that has been a recognised principle of science ever since."[1] Well, that looks like a very strong confirmation of Haeckel's thesis that matter and motion must be eternal. But Mr. Williams goes on: "The difficulty was to explain how matter began to move, what caused the first movement, what gave the primitive push?" But science, we have seen, knows nothing whatever about any "primitive push." It is a purely gratuitous assumption. Dr. Horton might refer us to "the matchless revelation of Genesis," and we might suggest that the Babylonian astronomers of 6,000 years ago are not very safe guides. Mr. Williams is content to assume the fact of this "primitive push" without saying why he thinks there was one. More than that, he is greatly excited because Haeckel declines to attempt to explain it until some good reason has been shown for thinking there ever was such a thing. He tell his admiring audience that Haeckel says "the origin of movement is no difficulty because it never did originate, he explains by simply denying! What evidence does he adduce? Absolutely none." Dr. Haeckel, one would think, can hardly be expected to spend time in finding scientific proofs for the first chapter of Genesis. His position is negative. Eternity is a negative concept. We do not prove negations in logic, or in real life. Mr. Williams further says he has no objection to Haeckel holding this "as a belief," but he "does object to his contention that this type of monism is based upon empirical investigation." This is an unfortunate confusion. The essence of Haeckel's position is negative. But he goes beyond the agnostic chiefly on the ground of (1) the astronomical evidence, and (2) the constancy of matter; and those constitute empirical evidence. But to take them as more than suggestions, and to ask empirical proof that the world is eternal is rather funny. Finally, Mr. Williams says Haeckel is equally unsatisfactory about the origin of consciousness. This just illustrates Mr. Williams's essential confusion. We *know* that consciousness had a beginning, so there is no analogy; and in point of fact Haeckel, as we shall see, devotes whole chapters to the origin of consciousness.

Now this is a fair illustration of the dreadful confusion which rules in the minds of the people who put on very superior airs about Haeckel's "dogmatic" affirmation that the universe is infinite and eternal. They almost always assume, often in sweet unconsciousness, this most important thesis that there was a time when matter or motion was not. It is one of the largest assertions that was ever made on the poorest of sophisms. The scientific evidence, such as it is, favours Haeckel's negative attitude.[1] Philosophy is equally mute.

[1] *Does Science Destroy Religion?* (p. 13).

[1] It is true that Mr. Mallock thinks one might plausibly infer from what is called the *entropy* of the universe that it had a beginning. This is the only case where Mr. Mallock allows that scientific evidence even seems to help theism. But we shall soon see that the theory of entropy is totally unable to bear the strain of such an inference. Sir J. W. Dawson, one of the scientists Mr. Ballard raises from the dead to answer the *Riddle*, says science does not regard the universe as eternal "because, when we interrogate it as to the particular things known to constitute the heavens and the earth, it appears that we can trace all of them to beginnings at more or less definite points of past time." Even at the time this was written it was false in fact and unsound in logic.

The Greeks held that matter was eternal. "It is not more difficult," says Mr. Mallock, "to suppose an eternal, self-existing and self-energising substance than it is to suppose an eternal and self-energising God." But Christian scholars have, in the interest of dogma, tried to prove that the universe must have had a beginning. We have seen how Dr. Dallinger skipped from "bourneless immensity" to "finiteness," and concluded that "what is finite begins to be." The last link of his curious chain is hardly better than the others. Dr. Iverach suggests the argument, but abandons it (Ch. I., *Christianity and Evolution*). Dr. W. N. Clarke says: "The things that we behold, mutable though magnificent, bear the marks, not of original, but of dependent existence. Somehow existence has been caused."[1] Such an argument could only be elaborated with the aid of a mediæval metaphysic which we do not take to-day as a measure of things. Dr. Clarke, indeed, retreats to the position that even if it were eternal we should need a "character-giving Spirit" along with it; a point we shall discuss later.

To sum up: neither philosophy nor science points to a beginning of the scheme of things. In view of the constancy of matter and the inconceivability of a creation out of nothing, very strong evidence would have been required to make us accept this beginning. As it is, the only source of the assertion is the first line of Genesis and a concern for theistic evidence. Professor Haeckel has preferred to be guided by the suggestions or indications afforded by scientific evidence. "Science points to no beginning," as Mivart wrote. "We have no evidence of definite space and time limits; quite the contrary. . . . And when we pass to more purely *a priori* considerations, the case against a universe with fixed and finite limits is equally strong."[2] Every effort to assign a beginning fails. We should never have heard of it but for "the matchless revelation of Genesis."

Let us now turn to consider whether science has anything to say with regard to the end of the universe. As far as our solar system is concerned, the teaching of science is firm. Our sun can only sustain his terrible vitality by shrinking a certain number of feet every century. He is doomed, as far as astronomy can see, to die, like the dark stars that already lie in the vast cemetery of space. The air and water will disappear from the surface of our planet, and for a time the heat of the sun will beat upon the white tomb of all the hopes and all the achievements of humanity. The moon is the skeleton at our feast. Its yawning sepulchre points out the fate that awaits us.

> Thou too, oh earth—thine empires, lands, and seas—
> Least, with thy stars, of all the galaxies,
> Globed from the drift like these, like these thou too
> Shalt go. Thou art going, hour by hour, like these.[1]

Perhaps Jupiter and Saturn will even then teem with life, and their astronomers study nightly the scarred and silent face of the planet we enliven to-day.[2] But from planet to planet the hand of death will travel. Then one by one, astronomers believe, the planets will fall into the shrinking bosom of the sun and eke out its failing vitality. At last the blood-red sun will die out, and continue to speed through space at twelve miles a second, a dark, solid, silent, and gigantic sepulchre. Physicists talk of ten million years. It is an hour in eternity.

[1] *An Outline of Christian Theology*, p. 109.
[2] Prof. J. Ward, quoted previously.

[1] Mr. Mallock's *Lucretius*.
[2] When Prof. Lionel Beale says (*Vitality*, p. 4) that "the more recent discoveries as to the constitution of our sun and the planets as well as the fixed stars, render it most improbable that life exists in these or other orbs," one can only gasp with astonishment. There is no truth whatever in it; and the mere idea of people living in the stars—at a temperature of several thousand degrees—makes one uncomfortable.

For this is only a relative end. The whole hundred-million-year drama of our history will be, in our present cosmical perspective, only the subsidence of a tiny ripple on the bosom of an illimitable ocean. Millions of similar dramas had been played out before ours began; and when silence shall have fallen successively on the planets of our system, the great nebulæ that lie against the background of space will be but waking into existence. Moreover, the dark stars, and the new stars that appear at times in the heavens, point to an indefinite prolongation of the process. The colliding of two of these extinct suns—two globes of perhaps 800,000 miles diameter (like the dark companion of Algol)—would generate heat enough to reduce them to a nebulous mass, pouring out for millions, if not billions, of miles; and the force of gravitation would ensure a further condensation and world-formation. Actual collision is, indeed, not believed to be necessary; in cases an approach within a few million miles is believed to have led to a stellar conflagration. Moreover, there are stars so stupendous (take Arcturus, for instance), and moving at such inconceivable speed through the universe, that we can only look upon them as destructive anarchists. The universe, taken as a whole, has all the appearance and promise of "perpetual motion."

Recent writers have, however, appealed to the theory of entropy as a scientific indication of an end of the process. Briefly, all energy can be (and is daily) converted into heat, but heat is not all reconverted into electricity, &c. This seems to forecast a time when all the working energy of the universe will be dissipated, or lost in a generally diffused heat. Mr. Mallock has pointed out (though Lord Grimthorpe and others had done so years ago) that if this were true the universe cannot have been eternal. We should have reached the final stage long ago. Haeckel has described and rejected the theory. It only remains for me to show how the very latest pronouncements of science quite confirm his position. Physicists generally are by no means disposed to allow that, because in our laboratories a certain quantity of the heat-force cannot be reconverted, we may jump to a cosmic conclusion on the matter. Mr. Mallock admits that many physicists reject it altogether, "but since others equally eminent maintain that there is no escape from it—so far at least as our present knowledge extends—it is necessary to consider how it may bear on the point at issue." The parenthetic clause contains the essential weakness of the theory. It assumes an acquaintance with cosmic processes which science is very far from possessing. Sir O. Lodge deals with the point incidentally in his recent Romanes Lecture. "So long," he says, "as there is only a force of one sign at work it would seem that ultimately the regenerative process must come to an end. The repellent force exerted by light upon small particles, however, must not be forgotten; and there are other possibilities." These possibilities have been emphasised by the most recent discoveries in physics, in connection with radio-action, so that Haeckel was more than justified in declining to accept the hasty and unwarranted conclusions of the entropists.

Sir O. Lodge suggests an analogous theory with regard to matter—a kind of entropy of matter—but he suggests only to reject it. He and many distinguished physicists see in the phenomena of radium, which have so greatly agitated the world of physicists of late, an actual breakdown of the atom. Electrons (units of electricity) are detached from matter at an electrode, and it is believed that these electrons are really "bits chipped off" the atoms. It is a "reasonable hypothesis" that an atom of ponderable matter is made up of these electrons. An atom of hydrogen is something like the hundred-millionth of a centimetre in diameter; yet an electron has only about one-thousandth the mass of an atom of hydrogen. It is calculated that 700 electrons would go to make the hydrogen

atom, 11,200 to make the atom of oxygen, and so on with the other elements. Not that these electrons are to be pictured as locked in each other's embraces to form a solid atom. If the atom were magnified to the size of the Sheldonian Theatre, its constituent electrons would be "like full-stops flying about the room." They occupy the atom by their forceful activity, not by bulk. These electrons are thought to be the ultimate units of which the atoms of ponderable elements are built—though no doubt Sir Oliver would allow that there remains the question of the formation of these electrons themselves from a continuous medium. But the most curious fact is that in the experiments on radium the atoms seem to disintegrate and give rise to other forms of matter, which break up in their turn. This seems to point to a dissipation of matter into electrons corresponding to the dissipation of force into heat. But Sir O. Lodge reminds us at once of the impropriety of founding such large cosmic theories on our laboratory experiments. "There may be regeneration as well as degeneration," he urges, and he points to the analogy of the collision of stars.[1] Theoretical physics is making rapid pace to-day—too rapid, some physicists say. But the whole of its recent discoveries and speculations go to confirm those physical theorems which Professor Haeckel took from the physics of the time when he wrote (1890–5), and built into the structure of his system—viz., the unity of matter and force, the indestructibility of matter and conservation of energy, and the evolution of the ponderable out of imponderable matter and its natural aggregation, by gravitation, into nebulæ and solar systems. Monism can easily accommodate itself to any rectifications of the details of these theorems.

[1] On the whole question see the Romanes Lecture for 1903—which recalls the brilliant expository work of Professor Tyndall—and the proceedings of the Physical and Mathematical Section at the meeting of the British Association, September, 1903.

We are thus made acquainted with the second great law of the universal matter-force reality—evolution. Avoiding metaphysical and abstract formulæ, and keeping as closely as possible to the facts of science, we learn from the study of inanimate nature that the life of this great reality stretches as far behind and before us in time as its substance stretches over the abysses of space. We find it in a condition of orderly and continuous development. Chronologically, we cannot reach back to any stage of the process where we discover a continuous and homogeneous form of matter and force diffused through space. But physical analysis brings us almost within sight of such a "prothyl" (first-matter) and of the connecting link between ponderable and imponderable matter. If we can to-day witness the disintegration of the atom, we are completely justified in forming theories of its integration; and the theories find strong empirical confirmation in the astro-physical observations. We can trace the upward growth of our "prothyl" into the familiar chemical elements with their immense variety of properties—and it may be noted, in face of the recrudescence of old metaphysical theories as to these new properties, that the new elements (formed in radio-action, for instance) sometimes only acquire their distinctive qualities with very sensible gradations. The titanic forces of the universe—already differentiated into heat, electricity, gravitation, &c.—mould the new-formed matter into meteorites, nebulæ, stars, and solar systems. Man looks about him on a vast and restless ocean of being, on the surface of which the life of his whole race is no more than a momentary bubble.

There are two points to be considered before we follow Dr. Haeckel into the more contentious field of biological evolution in which he possesses an almost unique authority. We have to meet the charge that Haeckel tries to bully and depress us with the magnitude of this "cosmological perspective," and we

must see how far his opponents accept this teaching of modern science. Mr. Ballard declares that this "latest pseudo-gospel from Jena is as miserably belittling and depressing as it is intellectually invalid and practically unworkable." A critic in the *Daily Chronicle* expresses the same sentiment (as to depression), and it has been repeated by many of the reviewers. There is an excellent English proverb about the proof of a pudding which might have saved these writers if they had heeded it. Haeckel himself is by no means depressed by his "cosmological perspective," if he is saddened at times by the slow progress of truth. No Rationalist is ever heard to complain of or to betray the faintest depression at his position. Sometimes, indeed, with that marvellous alacrity of his, the theologian flies to the other extreme, and says the Rationalist must infallibly come to the practical conclusion to eat and drink and be merry. It is curious that we, who are credited at times with making too much use of reason, should be held to make so little use of it in the ordering of our lives. Quite certainly one effect of this perception of our infinite littleness in the universe at large, with its yawning cosmic sepulchres on every side, is to make us eager to enjoy our present life. Quite certainly we say to ourselves, in the words of Omar,

> "Ah! make the most of what we yet may spend
> Before we too into the dust descend.
> Dust into dust, and under dust to lie,
> Sans wine, sans song, sans singer, and sans end."

We have not the remotest idea of being depressed or bullied by the immensity of the universe or its sepulchral aspect. That would be folly, not rationalism. Moreover, it would be equal folly to plunge into those sensual depths which are so strangely said to be the alternative to depression. Life is too precious a thing to be squandered on every impulse. Its potentialities must be reasoned out. The promise and the prospect of developing its higher gifts must be pondered. Science, art, literature, social and political activity, refined intercourse, and sweet homes—those are the most precious gifts life offers to us. We are rationalistic enough to prefer the higher to the lower, to prefer gladness to depression.

The objection is, in fact, a purely captious one. Haeckel's belittlement of man is relative. It aims at discrediting the traditional and arrogant doctrine of man's uniqueness, which has done so much to obstruct the advance of truth in the nineteenth century. Even if it were depressing to learn that we are *not* compacted of a special material, and that the universe is *not* a toy-theatre for us to play our parts on before the angels, we should welcome the truth and speak it. The code of morals that consults our likes and dislikes does not find favour amongst Rationalists. But depressing the truth certainly is not; and it is only belittling in a narrow, comparative sense. One of Haeckel's critics proceeds to show that, "if we look at evolution from above downwards, man is still the chief thing in the universe." With a passing reminder that we do not know the whole of evolution—we do not know what the process may have produced in other planets—we need only say that here is, of course, another aspect of the question. But to suppose that it has been overlooked, and that the belittlement is other than comparative, is quite gratuitous.

The last point we have to deal with here is: What is the attitude of the opponents of Monism on the teaching we have seen thus far? As far as the inorganic universe is concerned, they accept the teaching of science, and are usually content to add to it a theistic supplement. They generally deny, as we saw, the infinity and eternity of the universe; and we have discussed the grounds of their denial. The more impetuous and less informed of them have some vague notion of rendering service to religion by criticising (for the edification of their followers) every

advance of scientific theory. Even Dr. Dallinger protests that the nebular hypothesis is not "an undisputed and established fact of modern science." Others, like Mr. Ballard, recommend the study of sceptical writers like Stallo. All these petty criticisms might profitably be left out of religious controversy. They tend to no conclusion now. There was a time when theistic evidence meant the detection of gaps in the scientific view of the world, and a rush to fill up the gap with supernatural action. It is beginning to dawn on the more enlightened of our theists that this is weak in logic, and dangerous in practice. Who could number the gaps they have occupied during the last two centuries—and deserted? They are beginning to see at length—what they were begged to consider from the beginning—that a gap in scientific construction may only mean our temporary (or even permanent) ignorance, and does not necessarily imply a real breach or defect in the action of natural agencies. We shall see more of this later. Meantime Mr. Mallock says: "If we compare the evidences in favour of the monistic doctrine generally with the objections urged by religious dualists against it, the great difference between the two is this: that whilst the objections of the latter are isolated, disconnected, casual, the existing evidences of the former cohere and dovetail into one another like numbered stones designed for some vast edifice: and whilst the missing evidences of the monist are one by one being found, the objections of the dualists are in daily process of being discredited."[1] Hence, he says, "educated apologists of all schools accept evolution to-day," and he quotes Professor Ward as saying that, if there has been any interference in the cosmic process, it "took place before the process began, not during it." And Professor Le Conte, whom Mr. Ballard recommends us to read, and who accepts evolution from the atom to the human mind, says: "Evolution is no longer a school of thought. The words *evolutionism* and *evolutionist* ought not any longer to be used, any more than *gravitationism* or *gravitationist*; for the law of evolution is as certain as the law of gravitation."[1]

So theistic writers are beginning to repudiate the theology of gaps. "How slow of spirit we have been to learn that the Divine Spirit does not work through gaps," says Mr. Newman Smyth.[2] Already we see a tendency to prove on theological principles that the world *must* have been evolved, from the primary matter (and there is a disposition to let this be eternal) up to the human mind; that evolution is the one divine process, and that the old idea of successive interferences in the work is too undignified altogether. This language will be heard from every village pulpit in fifty years' time. We need not be spiteful about it; but, on the other hand, these advanced theologians, who know it, might understand the irony and humour of a great scientist who has lived through the struggles of the last fifty years. At present the spectacle we witness is not unlike that of the competitors in a walking-match. In front are a few laymen like Professor Le Conte and Mr. Fiske (who have nearly dropped their theism for greater lightness on the way). Mr. Rhondda Williams and Mr. Newman Smyth are not far behind. Canon Aubrey Moore and Dr. W. N. Clarke would be well in the running if they were still here. Mr. Ballard, who thinks "Christian thinkers have every reason for accepting evolution as the general method of world-growth" (but makes a tremendous pother when it comes to the evolution of life), and Dr. Iverach, who is not anxious to quarrel with evolutionary terms "except in so far as they become the symbols of a mechanical evolution" (but *does* raise much dust as he goes along), are at a third stage. Mr. Ambrose Pope, who thinks

[1] *Religion as a Credible Doctrine*, p. 78.

[1] *Evolution and Religious Thought*, p. 66.

[2] *Through Science to Faith*, p. 20.

"the theory of evolution is a scientific hypothesis, true only in the sense that it explains all the facts to hand at present, true in exactly the same sense in which the theory of creation, as found in Genesis, was at the time it was written," comes a bad fourth—in line, however, with the average "cultured" preacher and the leader-writers and reviewers of the *Tablet*, *Guardian*, and *Church Times*. Then we have a straggling line of Christian Evidence Lecturers, tract-writers, preachers, and leader-writers in the *Methodist Luminary*, &c.; ending in bunches of suburban curates and rural vicars, who are still handicapped with heavy old copies of the Bible.

All this puts a peculiar difficulty in the way of the Rationalist. If he attacks the attitude of the advanced minority, Christianity at large repudiates his criticism; if he tilts at the conventional beliefs, the little band of the intellectuals use excited language. There is hardly a single question on which we have anything like a solid front to meet. This will be clearer as we proceed. As regards the inorganic universe, we may say that no Christian scholar of any serious influence questions its unity, its actual constancy (or its first law—the law of substance), or its formation by gradual development (its second law—the law of evolution) from a primitive matter. They rest their dualism, as far as visible nature is concerned, on (1) the need for a creator of matter and force, and (2) the need for a directive intelligence. With the first point—or with its groundwork—we have already dealt, and will deal again in the chapter on God. The second point must be very clearly grasped. It is the last conceivable quasi-scientific argument for the existence of God. It will confront us throughout the next three chapters, and it will before long be the only argument of "physical theology." In its general formula it runs: Although science can assign the efficient or physical causes of the complex phenomena about us, it cannot say *why* they produced just these phenomena and not different ones; and the more clearly science shows that an elaborate phenomenon—say, thought, or life—is only the outcome of a long and intricate evolutionary process, the more pressing is the need to admit that the evolutionary agencies were guided and controlled by intelligence from the first. The argument is not a new one, of course, but the best-informed theistic apologists are warning their colleagues to fall back on it at once, and to abandon the defence of temporary gaps and petty criticisms of science. "We are not," says Dr. Iverach (though he will forget it later), "of those who are constantly looking about for imperfections in a mechanical or other theory in order to find a chink through which the theistic argument may enter. If that were our position, the argument for theism would soon be a fugitive and a vagabond on the face of the earth; each advance of science, each discovery of law, would simply drive the theistic argument to find a new refuge."[1] So Mr. Newman Smyth says: "The assurance of faith cannot be maintained from a fortified critical position outside the province of the evolutionary science." And Mr. R. Williams declares: "I do not worship a God who only fills gaps, nor hold a religion whose validity depends on missing links." Teleology is the word. The scientist will show you everywhere certain forces co-operating to produce certain complex results. Point out that these "blind" erratic forces must have been guided in their co-operation, especially if the result is beautiful or orderly or beneficial or admirably adapted to produce a certain further result.

The advantage of "the new teleology"

[1] *Christianity and Evolution*, p. 26. Observe the excellent description of what the theistic argument *has been* for some time and the naïve proposal of this as a mere contingency. We shall find, too, that the old Adam is still strong in Dr. Iverach, and he is still keen on gaps in practice.

—which is the "old teleology" re-enamelled—is obvious. Science may now strain its mechanical causes as it pleases to explain the origin of life and consciousness. The more stupendous the results it claims for physical agencies, the clearer will it be that there were design, guidance, and control. Moreover, the argument comes into play from the very first step that evolutionary science takes. The best illustrations of its application will be found in Dr. Iverach and Mr. Profeit.[1] They follow step by step the teaching of physics and chemistry, and pause at the end of each paragraph to admire the wisdom of the creator with Paleyesque devotion. Behold the primitive matter mould itself into electrons and atoms. Whence did it get the power? How came a blind force to put together the electrons in such an orderly series of atoms with such wonderful chemical adaptations to each other? Behold the ponderable matter grow into nebulæ and solar systems. Who distributed the elements so nicely amongst the various nebulæ? Who distributed the elements *in* the nebula, and broke off the whirling rings at the proper moment, and set the planets going at the requisite speed, that a system of perfect order resulted, and was found to be just suited for the sustenance of life?

Now let us be perfectly clear. This argument is to be the great reply to Haeckel, and it will recur all through. It thinks it differs from the old Paleyism in this: it can grant science the power, either now or in the future, to give a complete explanation on physical lines of the up-building of an atom or a world. As it says, science may explain *how* these things were done. It adds that every thoughtful man must ask also *why*—why the process took place at all, and why it took this particular line, with such a lucky termination for us, rather than any one of a thousand others. They say: Let Haeckel explain the whole world-growth on mechanical principles, from the formation of the first atoms of hydrogen to the solidification of the last planet. That only tells *how* natural forces built up the world: we want to know *why*. So we can allow the naturalist or mechanical view to be complete in itself, yet leaving full room for us.

In order to avoid the repetitions and the confusion which this design-argument leads to, I propose to take the hint offered and keep quite separate the questions *how* the world was made and *why* it was so made. In this and the following three chapters we shall see how the world was made; in the seventh chapter we shall discuss the teleological argument in its principle. We shall see that the theistic evolutionists are by no means prepared in practice to allow that science can explain *how* all things were made, or to assign adequate efficient causes for the more complex phenomena. The first line of defence had better hold as long as it can, in case the second should be not quite impregnable. As to inorganic nature, however, there is no serious hesitation. The inherent or native qualities of the matter-force reality (I am not shirking, but deferring, the question why it has these qualities at all) are generally admitted to be the adequate efficient explanation of the formation of atoms and stars. The first serious challenge rings out when we come to the frontiers of living nature.

[1] *The Creation of Matter.* Mr. Ballard tells us this may count as a reply to the *Riddle*. It has been published since the *Riddle*, but does not seem to mention Haeckel's book.

CHAPTER IV

THE ORIGIN OF LIFE

No sooner do we pass from the consideration of inorganic nature to a discussion of the origin of life than we encounter in a severe form the perplexity I have previously indicated. Do theists or dualists deny that Haeckel may legitimately extend the monistic interpretation to the problem of life? At once we have to deal with a straggling line of contradictory thinkers, instead of the fairly solid front which we desire to face. A large number of the authorities recommended to us as correctives of Haeckel's philosophy entirely agree with him in his theory of the spontaneous generation of life, and are content to add, as before, the teleological consideration. A large number severely criticise his position—and therefore that of their own advanced colleagues—even from the point of view of physical or efficient causation; and there is every grade of vacillation between the two. It will be interesting to see first how far the doctrine of the first appearance of life by abiogenesis is accepted by theistic writers.

It is well known that Dr. Mivart defended the doctrine with great ability for the twenty years preceding his death. To-day Father Zahm and other Catholic scientists are no less willing to admit it. That Professor Le Conte and Mr. Fiske accept it goes without saying. Dr. W. N. Clarke is disposed to grant it: "Life, when its time came, may have come in by direct creation; so may human life or the life of other species; or the whole process of unfolding may have been continuous, impelled by only one kind of divine movement from first to last." Whether God has performed specific acts of creation from time to time is a question for evidence, which lies outside the field of theology."[1] Mr. Newman Smyth admits that it is now irresistible: "While the fact is now universally admitted that non-living matter cannot now be organised into a living form except through the prior agency of life, on the other hand the momentum of all our scientific knowledge of the continuities of nature leads modern biology to the assumption that the organic substance at some time has been raised and quickened from the deadness of the inorganic world."[2] Mr. Profeit also is willing to admit the evolution of protoplasm, though only "as the result of working intelligence."[3] Dr. Iverach, who is also anxious to stress the teleological aspect, nevertheless admits that life was "implicit in the whole"; though we shall find him raising superfluous difficulties later.

Thus in his allegation of the fact that life was evolved out of non-life Professor Haeckel finds himself in quite respectable company. The sonorous philosopher of one of our dramatic and sporting papers (the *Referee*) delivered himself as follows some months ago (March 1st, 1903): "At the very threshold of this great theme we encounter the eternal question as to how life began at all, and here the scientist cannot help us." It would be

[1] *Outlines of Christian Theology*, p. 132.
[2] *Through Science to Faith*, p. 17.
[3] *The Creation of Matter*, p. 96; his proviso is, of course, shared by all these evolutionists. We are for the present concerned only with efficient causation. When Mr. Profeit goes on to tell us that when protoplasm appeared "the stars clapped their hands for joy," we can hear the rustle of his surplice. The evolution must have taken millennia, if not millions of years. There was no psychological moment for applause.

interesting, and not a little enlightening, for "Merlin" to investigate this—under the circumstances—remarkable phenomenon of a group of ardent religious apologists subscribing to the doctrine of abiogenesis. But "Merlin" might quote a number of scientific men (of ecclesiastical standing) who make the same affirmation in yet stronger language, and who denounce Haeckel with some vigour for representing abiogenesis as a scientific theorem. There is Dr. Horton, the admirer of Vogt and Büchner, who assures us that "no leading man of science treats it [Haeckel's theory of the origin of life] seriously." But the leading opponent is Mr. Ballard, and we will treat his criticism at respectful length. It will lead us, sooner or later, into the heart of the difficulty.

It will be remembered that in his attack in the *British Weekly*, in which he emulates the spirited Dr. Loofs in literary manner, he devotes the bulk of his articles (about twelve columns out of thirteen) to preliminary observations, and then turns, "for sheer relief," to criticise Haeckel from the scientific point of view. I will strike off superfluous errors as I go along, and deal with the essence of his objection afterwards. "To begin with," he says, "its fundamental thesis is utterly unscientific, viz., the assumption of the actuality of spontaneous generation." To begin with, I may repeat, this sentence contains three grave and essential misrepresentations. Spontaneous generation is very far from being the "fundamental thesis" (or the "fundamental axiom" and "crucial proof" he elsewhere calls it) of the *Riddle*, or of Haeckel's system; it is not an "assumption," but a serious conclusion; and Haeckel does not claim that spontaneous generation takes place to-day. It is preposterous to suppose that Haeckel's fundamental thesis should be one that many Christian scholars accept, and the reader will already understand that, though it is necessarily involved in Monism, it is no more "fundamental" than ten other propositions. But Mr. Ballard proceeds to make good his statement. He says Haeckel "'frankly acknowledges that spontaneous generation is 'an indispensable thesis in any natural theory of evolution. I entirely agree with the assertion that to reject abiogenesis is to admit a miracle.'" "An," one may observe, is different from "the," and "indispensable" from "fundamental"; but that is a comparative trifle. No page is given, but if you do look up the passage (page 91) you find that Haeckel is saying that *Professor Naegeli* represents it as "an indispensable thesis," and that "the assertion" should be "his assertion." It would not do, I suppose, to let readers of the *British Weekly* know that Haeckel does not stand alone, so the quotation is manipulated. Moreover, the phrase, "to reject abiogenesis is to admit a miracle," is quoted by Haeckel from Naegeli, but the quotation marks are omitted by Mr. Ballard. The reader may judge if the fact of Haeckel's agreeing with Naegeli justifies this. I know that Mr. Ballard quotes the passage fairly in his *Miracles of Unbelief*. My second point, that it is not an "assumption," will be clear when I come to resume the evidence for it. The third point is that if Mr. Ballard uses "actuality" in the ordinary sense of the word, as the ordinary reader will suppose, he gravely misstates Haeckel's position. That he does imply that Haeckel claims spontaneous generation to be "actually" occurring is clear from his appeal to those scientists (Tyndall, Pasteur, &c.) who disprove no more than this. As a fact Haeckel says (p. 91): "I restrict the idea of spontaneous generation—also called abiogenesis or archigony—to the *first* development of living protoplasm out of inorganic carbonates." Further, Haeckel refers the reader to his earlier work for details, and Mr. Ballard himself quotes therefrom that Haeckel only offers the doctrine as "a pure hypothesis" without experimental support.

Haeckel's position is, then, properly stated, that we have no evidence that

living things now arise by spontaneous generation; that the monistic view of the universe, which other scientific evidence commends, requires the birth of living things from non-living in the beginning; that he finds no peculiar qualities in the vital force which forbid the extension of the law of evolution to it; and that he therefore sketches a purely hypothetical suggestion of the mode of transition on broad lines. A really careful and impartial inquirer would see that the essential part of this position, from the logical point of view, is the third part of it—the conviction that there is no peculiar feature of the vital force which forbids us to assume its evolution. Evolution is a known law of the cosmos—or "the general method of world-growth," as Mr. Ballard says. We apply it until we are pulled up by some phenomenon of a specific nature that seems impossible to have been evolved. But Mr. Ballard utterly disregards this chief strength of Haeckel's position (supported by the whole of this chapter of the *Riddle*), proceeds to flourish weapons which do not reach that position at all, and concludes that Haeckel is "utterly without scientific warrant," or, as he has previously said, he "sets at defiance the latest and most exact findings of science, and cuts the Gordian knot by sheer assertion of that which is essential to his hypothesis, but is itself undemonstrated, and, we may venture to add, on good authority, undemonstrable." His procedure is so typical of the usual confused discussion of the subject that we may follow him to the end.

After saying that Haeckel offers no proof—which we will discuss presently—he goes on to overwhelm him with the "conclusions of experts." "Between the inorganic and the organic, there is, according to all the facts now known and the consensus of modern science concerning them, a stage in which, to quote Mr. Wallace, 'some new cause or power must necessarily have come into action.'" We are defending a gap after all, you see; though Mr. Ballard says it is not essential to do so. Further, it is not only "utterly without scientific warrant," but "emphatically" contradicted by "the conclusions of such experts as Tyndall, Pasteur, Drysdale, Dallinger, Roscoe, Kelvin, Beale, &c."; and "for modern science, speaking generally and carefully, spontaneous generation is as dead as Huxley's Bathybius." One's mind goes back involuntarily to those clerical spontaneous generationists and the horrible levity with which they have deserted the gap. The truth is, as those who know anything of the controversy will have seen long ago, Mr. Ballard is throwing dust. He knows perfectly well that the only point on which scientists are agreed—and Haeckel is quite with them—is that abiogenesis does not take place to-day; that is a thesis which Haeckel has explicitly disavowed. The experiments of Pasteur never purported to prove anything else, and never could. His favourite Professor Beale admits his own solitude: "Physicists and chemists look forward with confidence" to further experiments, and "think to acquire a knowledge of the manner in which the first particle of living matter originated."[1] He cannot quote a single biologist to say that his science is against Haeckel's "hypothesis" of abiogenesis in the past. I will presently quote more than one in favour of it, in the sense of endorsing Haeckel's most important point—that there is no essential difference between vital force and non-vital force. He, a bachelor of science, has blurred the distinction between actual abiogenesis and archigony, which is essential, and which has been pointed out for twenty years by men of science. And this is the culmination of his attack on Dr. Haeckel, and, I suppose, the chief justification for the gross epithets he has showered on one of the most venerable figures in the scientific world.

Mr. Mallock says: "It was formerly

[1] *Vitality*, p. 7.

supposed that they [life and man] were produced by isolated creative acts; but we now know that they are the results of an orderly process of evolution. The theist of to-day admits this as fully as anybody." Unfortunately, we see that there are theists, who are held to be men of scientific culture and liberality, who do not admit it, and we must discuss the subject patiently. This is largely the result of people like Mr. Ballard, in their eagerness to draw up a long list of "sound" literature, recommending all kinds of antiquated works. For instance, one of the authors he urges us to read on this question, "Principal Chapman," assures his readers that Büchner and Haeckel assert "life *now* can be reproduced out of inorganic conditions," and attacks the "asserted possibility of artificially producing organic compounds" —which are produced artificially by the score to-day; whilst his general culture may be measured by his giving the motto of the Büchner school as: "Ohne Phosphor ohne Gedank." This does not tend to the advancement of truth. Let us have a clear idea what the real position of Haeckel's theory is in science.

I have stated it in four theses, and will deal with these separately. In the first place, scientists of all schools are agreed that we do not know a single case of abiogenesis taking place to-day. Curiously enough, religious philosophers in the Middle Ages believed that any number of highly organised forms of life (such as bees) were produced daily by spontaneous generation. It was science that first opposed them. However, a few decades ago a group of materialistic scientists made a stand for abiogenesis as an actual occurrence, and there was a fierce controversy. It was a purely scientific quarrel, Tyndall opposing them as firmly as the semi-vitalist Pasteur. It was abundantly proved that no living thing we are acquainted with to-day is developed without living parentage. This is that "teaching of science" (to which Haeckel fully subscribes) which Mr. Ballard and others so confusedly represent as opposed to Haeckel. Science draws no inference, and logic can draw no inference, with regard to the primeval origin of life from this negative evidence. This has been pointed out time after time, as it was by Sir W. Turner in his Presidential Address in 1900.

Haeckel's second point (in my analysis of his position) is that we have ample reason to regard evolution as a law of substance, or a law of nature. We have seen how completely scientific this thesis is. "Evolution," said Canon A. L. Moore, sixteen years ago, "may fairly claim to be an established doctrine."[1] And we have quoted the Rev. Newman Smyth's opinion that "the momentum of all our scientific knowledge of the continuities of nature leads modern biology to the assumption that the organic substance at some time has been raised and quickened from the deadness of the inorganic world." As a matter of scientific procedure, then, we are bound to assume that life arose by evolution *until* it has been proved that the vital force is something specifically distinct from physical force, and could not have been derived from it. That is both the scientific and the logical way of looking at the question. The scientist does not depart from his ordinary methods without grave reason; nor does nature. Nature evolves, wherever evolution is not impossible. The really important point is, then, this question whether there is something so peculiar about vital force that we cannot suppose it to have been evolved; and we find accordingly that Haeckel devotes several pages to the point. I will not repeat, but only supplement these from other scientists; though, as we will discuss the question of the nature of life more fully later (in the chapter on Lord Kelvin's intervention), I will not say more than is necessary for our purpose here.

[1] *Science and the Faith*, p. 162: one of the works Mr. Ballard recommends to us.

Let me begin by quoting this admirable warning to those who affirm that nature could not have evolved life without a divine interference: "In spite of all present-day scientific generalisations, and these based on the widest inductions possible to us, we have no warrant whatever for the assumption that the possibilities of the universe end where our human apprehension of nature has reached its *ne plus ultra*." Does Mr. Ballard recognise the words? They are taken from his own preface to his *Miracles of Unbelief*. A theistic philosopher, Professor J. Ward, also says: "Of the origin of life, if it ever did originate, we have absolutely no knowledge. But, on the one hand, there is no definite limit to the possible complexity of mechanical processes, nor any definite limit on the other, to the possible simplicity of life."[1] These are timely warnings to the theist not to build on gaps in biology. Yet Dr. Horton tells his trustful congregation that science has "not discovered what is that *vast bridge* which spans the regions which, to the eye, appear so near." And a reviewer in the *Church of England Pulpit* says the gap between the living and the non-living is "now wider than ever." If you seek the authority for these assertions, you are generally met with a reference to Professor Lionel Beale. Now, Prof. Beale is an able scientist and original worker, and we will examine his claims about protoplasm in a later chapter. Meantime, we may recall that it was he who so pathetically protested in the agony column of the *Times* that Haeckel's asseverations in this chapter were not in accord with the teaching of science, and later referred the anxious world to his little work on *Vitality*. Now, when we peruse *Vitality* we are given to understand almost from first page to last that Professor Beale is nearly *contra mundum*. "It must be admitted," he says (p. v), "that few scientific men are quite satisfied that vital phenomena may not yet be otherwise explained"; and we have already quoted his admission (p. 7) that "physicists and chemists" look forward to a mechanical explanation of the origin of life.

And in point of fact one can quote a string of the ablest authorities against the claim that vital force has so specific a character that it could not have been evolved. Says the theistic (or pantheistic) evolutionist, Professor Le Conte, one of Mr. Ballard's chief authorities: "Vital forces are also transmutable into and derivable from physical and chemical forces . . . Vital force may now be regarded as so much force withdrawn from the general fund of chemical and physical forces . . . If vital force falls into the same category as other natural forces, there is no reason why living forms should not fall into the same category in this regard as other natural forms."[1] Says Professor J. Ward, another of Mr. Ballard's authorities: "The old theory of a special vital force, according to which physiological processes were at the most analogous to—not identical with—physical processes, has for the most part been abandoned as superfluous. Step by step within the last fifty years the identity of the two processes has been so far established that an eminent physiologist does not hesitate to say 'that for the future the word vital, as distinctive of physiological processes, might be abandoned altogether.'"[2] The "eminent physiologist" is Sir J. Burdon Sanderson, another able authority. In the article on zoology in the *Encyclopædia Britannica*, Professor Ray Lankester says: "It is the aim or busi-

[1] *Naturalism and Agnosticism*, ii, 262. Professor Ward, therefore, assumes life was evolved. The words, "if it ever did originate," must be understood in the idealist sense; and the emphatic denial of knowledge is grounded rather confusedly on the Pasteur experiments.

[1] *Evolution and Religious Thought*, p. 36.

[2] *Naturalism and Agnosticism*, ii, p. 9. Ward and Le Conte, while admitting the mechanical theory as the explanation of "efficient" causation, claim the action of a guiding intelligence. That is a point we have reserved, and it does not affect the present question.

ness of those occupied with biology to assign living things, in all their variety of form and activity, to the one set of forces recognised by the physicist and the chemist." On the physical side Sir A. Rücker, in his presidential speech of 1901, spoke of the recent rise of Neo-Vitalism as merely the result of "some outstanding difficulties" in biology, and he protested that "the action of physical and chemical forces in living bodies can never be understood, if at every difficulty and at every check in our investigations we desist from further attempts in the belief that the laws of physics and chemistry have been interfered with by an incomprehensible vital force." His successor in the presidential chair also protested that science was "not debarred from speculating on the mode in which life may have originated," and he quoted this splendid expression from Lord Kelvin's (then Sir W. Thomson) presidential speech in 1871: "Science is bound, by the everlasting law of honour, to face fearlessly every problem which can fairly be presented to it. If a probable solution, consistent with the ordinary course of nature, can be found, we must not invoke an act of Creative Power." And, finally, when Lord Kelvin recently declared that he understood biologists were coming again to entertain the notion of a specific vital force, he was, as we shall see (or the reader may see now in Chap. XI.), emphatically contradicted by the representative biologists of this country.

The authority of Dr. Haeckel himself on this point is paramount. He has made a life-long study of it. But I have shown that his conclusion is in accord with the general scientific attitude to-day, and that he is not giving us the "science of yesterday," as the dilettanti of the *Pall Mall Gazette* express it. I will only add here a few further considerations that tend to make clearer the question of the primitive origin of life, and will reserve the discussion of Neo-Vitalism until we come to deal with Lord Kelvin and his critics.

It is a matter of some importance to remember that we do not know the nature of the earliest organisms. Living things had to proceed very far in their development before it was possible for their remains to be fossilised and preserved. Palæontology can give us no aid whatever. It is generally assumed that the monera and such simple forms—mere tiny globules of protoplasm—were the earliest in point of time. That they must have been the earliest of existing forms is obvious, but, as Professor Ward suggests, it is conceivable that there were many simpler forms of life before the moneron. We had to wait for the microscope to discover the protists. We may make other discoveries yet; or there may have been earlier forms too unstable to persist. These are "may be's," but remember Lord Kelvin's advice that we must exhaust the possibilities of nature before we invoke "an abnormal act of Creative Power." Canon Aubrey Moore said long ago in connection with the evolution of species: "In this process of evolution there are things which puzzle us, though it would be quite true to say there is nothing half so puzzling as there was, if we had only thought more about it, in the old theory of special creation." That is peculiarly applicable to the question of the origin of life. The notion of a "creative act"—the notion that, at the mere expression of a wish on the part of some infinite being, particles of "dead" matter scrape themselves together without any physical impulse, and, though they are incompetent to see the design they are to execute or the end of their individual movements, build themselves up into the intricate structure of living protoplasm—is a perfect world of mysteries, instead of being an "explanation." We can only have recourse to it when every conceivable effort has been made to explain the phenomenon by the physical impulsion of the atoms by natural forces and by a very slow and gradual development; and science, we saw, is by no means inclined to admit

that its possibilities have been exhausted yet.

But if we cannot get any nearer to the origin on the biological side, it may be possible to do something on the chemical side; and from this side, in point of fact, the "gulf," as preachers call it (compare Huxley's article on Biology in the *Encyclopædia Britannica*), between the organic and the inorganic is being bridged. If you take down one of the apologetic works of the last generation (even some of those Mr. Ballard recommends to-day), you will find that the writers lay great stress on the inability of the chemist to produce artificially certain compound substances which were then only made by the living organism. To-day a large number of these are produced by the chemist in his laboratory. This branch of chemistry is advancing every year, and last year was able to announce the artificial synthesis of a complex organic substance resembling albumen. The "gulf" is narrowing; it is very far from being "wider than ever." Dr. Iverach, one of those hesitating teachers who are continually criticising scientific results with some vague notion of serving religion, says these chemists only "accomplish at great cost and labour and with many appliances what life is doing easily every moment." Very true; but, pray, how long was nature in fitting up *her* laboratory and making *her* appliances? Possibly millions of years in making the protoplasm of the first moneron; certainly many millions of years in evolving those higher organisms which the scientist is set to emulate. One does not see what liberal-minded and scientific men gain by strewing the path with little obstacles of this kind. There are other writers who say chemistry may produce organic substances without number, but it cannot produce an organism. Well, on the theistic-evolution hypothesis, which the abler apologists adopt to day, it took God hundreds of thousands, if not millions, of years to make an amœba, with all the resources of nature completely known to him. And man, with his dim knowledge of natural forces, is to make one in a few weeks, or years! Science is advancing. Let us be patient.

We are now in a position, then, to estimate the criticisms that have been directed against this section of Dr. Haeckel's system. There are two aspects of his position. On the one hand there is the negative side, that we are not justified in rushing into the present gap (such as it is) of scientific knowledge with a "vital force" or a "creative power," which are specifically distinct from the natural forces we have hitherto studied; and there is, further, the positive attempt to sketch a theory of the way in which protoplasm was evolved. The first part is essential to monism; the second is not, and may vary with the progress of science. Both parts are scientifically justified. How widely Haeckel's first position is shared by men of science, and how it is forced on us by the axioms of men so different as Lord Kelvin and Canon A. L. Moore, we have already seen. It is the only logical attitude. When science assures us that it has acquired a perfect knowledge of vital force on the one hand and physical force on the other, and that the two are so widely separated that it cannot conceive the one to have been evolved from the other; *then* there will be time enough to talk of gaps and gulfs and creative power. In the meantime logic forbids us to multiply agencies without need. There is a plausible kind of critic—usually a preacher—who says: Well, Haeckel may enjoy his opinion as long as he likes, and the agnostic may wait eternally for the last word of science, but I find this creator-idea very satisfying, and you may keep your logic for the school. That is the practical man—the man who would think you a fool if you reasoned like that in business. It must be remembered that we are not playing a parlour game with conventional rules. It is a question of truth or untruth, reality or unreality. It is a huge assertion, this of creative action. It at once

brings a new element into our cosmos. We see that the material universe exists. We must not recklessly affirm the existence of anything beyond it; or if we do, we have no guarantee of the truth of our statements. Now, until science has shown that physical force and vital force are *not* transmutable, and that no extension of the former, even into the most elaborate complication, could produce the latter, you cannot extract from the appearance of life a particle of evidence for an interfering cause other than nature.

But Haeckel does not cease to speak as a scientific man when he goes on to offer a positive suggestion as to the origin of life. Science advances commonly by projecting hypotheses in advance of its solid and established positions, and if ever we are to understand the mode of the origin of life it will be by such a procedure. No living scientist is better acquainted with the conditions of the problem than Haeckel, and it would be preposterous to suppose that he has not framed a theory consistent with the known facts. His theory is directly grounded on the established facts of the chemistry of protoplasm. The only possible justification for the criticism offered by scientists like Dr. Horton would be if Haeckel had put it before us as a sort of photographic description of the primeval dawn of life. As Mr. Ballard reminds us, Haeckel only offers it as "a pure hypothesis," consistent with the facts as we know them, and capable of any modification new discoveries may entail.

Thus, when we have shaken off this group of not very enlightened critics, we see that we have advanced a step in the evolution of the monistic universe. We had already followed the great matter-force reality in its development as far as the formation of planets with firm crusts, with heated oceans and an enveloping atmosphere, and provided by a shrinking central luminary with a powerful flood of heat, light, and electricity. Some time in the pre-Cambrian epoch living things appeared in the primeval oceans. This was not a sudden and dramatic entrance on the stage of time, at which the morning stars might clap their incandescent hands; it was the final issue of a long course of evolution. It was the matter-force reality slowly groping upwards through more and more elaborate combinations of the formed chemical elements until a stage was reached when a substance sufficiently plastic to exchange elements with the environing fluid and sufficiently stable to maintain its integrity was formed. To-day this substance (living protoplasm) is marked off by several remarkable properties from inorganic matter. Professor Beale talks much of its "structureless" character. In view of the known extreme complexity of its *molecular* structure, it would be a miracle if it did not exhibit functions widely removed from those of simpler compounds. But the finding of an actual divergence to-day is no obstacle to our entertaining a theory of evolution. No serious scientist questions to-day the evolution of the human body from that of a lower animal species. Yet the connecting links have disappeared. It is a scientific truth that intermediate forms do tend to disappear. We see here, then, only another phase in the unfolding of the cosmic substance, or nature. Neither scientific evidence nor logic compels us yet to admit a fresh reality, a new form of being. We are still monists. Whether nature has needed the guidance of intelligence in this evolution we need not consider yet. First let us establish the fact that nature evolves, from the first union of electrons into an atom to the development of man, by means of its inherent forces, and then we will consider "whence" it got these forces and whether they must have been guided.

Now, given the first tiny globule of living protoplasm, there is no further gap for the theologian to defend until we come to the human mind. For the fifty million years which extend from the

Laurentian epoch to the early Pleistocene we witness the natural evolution of the cosmic substance without any plausible interference. Naturalists "have accepted Darwin's idea," Sir W. Turner tells us in his presidential speech; and he speaks with respect of Haeckel's great share in constructing our ancestral tree. Huxley said a long time ago that he "refused to run the risk of insulting any sane man by supposing that he seriously holds such a notion as special creation." Canon Aubrey Moore wrote sixteen years ago that "every competent man of science believes in the origin of species by progressive variations."[1] "All living nature is of one descent and constitutes one relationship," says Mr. Newman Smyth. "Evolution as a law of derivation of forms from previous forms . . . is not only certain, it is axiomatic," says Professor Le Conte. "The immutability and separate creation of species . . . are doctrines now no longer defensible," says Professor Ward. And Professor Flower (to whose qualifications Mr. Ballard devotes ten lines—much more than Professor Flower ever devoted to theology) told the Reading Church Congress twenty years ago (1883) that the doctrine of the evolution of species was even then "almost, if not quite, universal among skilled and thoughtful naturalists of all countries," and advised the clergy not to burn their fingers again with it.[2] We might fill a book with such quotations.

Happily, there is no longer the need to do so. Darwin lies in Westminster Abbey, and episcopal lips utter his name without a tremor. No one now questions the fact that the species have been formed by evolution; but there are still ecclesiastics who take this occasion to show that they are of a critical rather than a credulous temper. They quarrel with the agencies which science assigns to the task of the formation of species, or with the mode in which science conceives those agencies to have acted. They express an opinion that natural selection and sexual selection could not do this or the other; that the question of the transmission of acquired characters is very unsettled, and so forth. Now, it is in itself a healthy sign of the times that our theologians take an interest in these scientific questions, and as scientific men. But the cause of truth and progress, and the placidity of scientific workers, would be best consulted by keeping these criticisms out of Christian evidence treatises, with which, logically, they have nothing to do. Thus Dr. Iverach discusses the question at great length in his *Theism in the Light of Present Science and Philosophy*. He thinks that natural selection may act on variations, but cannot initiate them, and cannot show why some organisms remain unicellular and others become multicellular. Biologists do not, he urges, prove the indefinite expansiveness of species, and do not explain the special causes which check expansion. In strict logic this has nothing to do with "Theism." If biologists have not adequately explained the process of evolution, we must wait until they have further knowledge. His point is, of course, that the triumph of evolution only means "to transfer the cause from a mere external influence working from without to an immanent rational principle." He is pleading again for that "incomprehensible vital force," as Sir A. Rücker calls it, which we have already discussed and will discuss later.

If it is sufficient to admit natural (physical and chemical) forces in the first formation of protoplasm, we meet nothing to turn us aside from these with any plausibility until we come to consciousness, which I will treat in the next chapter. With that reservation Haeckel's mechanical explanation of the derivation of species is accepted. Professor Ray Lankester says, in the article on zoology in the *Encyclopædia Britannica*: "It was reserved for Charles Darwin in the year 1859 to place the

[1] *Science and the Faith*, p. 165.
[2] *Recent Advances in Natural Science*.

whole theory of organic evolution on a new footing, and by his discovery of *a mechanical cause* actually existing and demonstrable, by which organic evolution must be brought about, to entirely change the attitude in regard to it of even the most rigid exponents of scientific method." The recent letters of Professor Ray Lankester to the *Times*, which I will quote later (Chap. XII.), show that he has not departed from this position. Dr. Croll also admits of the derivation of species: "At present [1890] most evolutionists regard the process as purely mechanical and physical, the results of matter, motion, and force alone."[1] And Mr. Fiske says: "The natural selection of physical variations will go far towards explaining the characters of all the plants and all the beasts in the world."[2]

But do not let us lose our way amidst conflicting authorities. Two objections are formulated, more or less vaguely, against this phase of Haeckel's position; or the two objections may be combined into the general statement that the mechanical explanation leaves some aspects of the derivation of species unaccounted for; and so we must admit, besides the evolving matter-force reality, a telic or purposive principle in the organism and a general controlling intelligence, or at least the latter (Fiske, Ward, Le Conte, &c.). The second opinion does not really conflict with our present purpose, because it assumes that this directing intelligence never *takes the place* of physical agencies. It always acts *through* mechanical causes, so that science is quite right in expecting to build up a perfect mechanical scheme of the development of the world-substance. With its further contention that this mechanical scheme points to an initial designer, we will deal later. It is only the first opinion—that which postulates a purposive principle *in* the organism—which conflicts with the monistic view at this stage. And this second opinion is, frankly, a philosophy or a theology of gaps. It lodges in the breaches, or supposed breaches, in our knowledge of the evolutionary processes, and naïvely takes these to be breaches in the cosmic scheme itself. Remember Mr. Ballard's wise injunction that "we have no warrant whatever for the assumption that the possibilities of the universe end where our human apprehension of nature has reached its *ne plus ultra*"—for the time being, let me venture to add. Which attitude is the more logical and scientific, and the best accredited by experience—this defence of gaps, or the resolution to admit no aquosities or vitalities, or other immaterial entities until science has given a definite and fully-informed decision?

Professor Haeckel adopts the latter attitude, and proceeds to reconstruct the wonderful paths that nature has followed in her journey from those ancient Laurentian waters to the achievements of man. We have three convergent and consonant lines of evidence: the documents of palæontology, or the science of fossils, the documents of zoology (to speak of animals only), and the documents of embryology. From them, as from three synoptic gospels, we retrace the upward growth of living nature. The earliest organisms we can definitely picture to ourselves are simple granules of protoplasm, or structureless morsels of an albuminous matter. In time some of these are formed which live on their fellow-protists, and the distinction of the animal from the plant is adumbrated. Later, some of them develop a nucleus and form definite cells; the cells cling together in colonies and form multicellular organisms; these cells are disposed in a layer or skin with a central cavity, and develop fine hair-like processes by which they can travel through the water. As the ages advance some of these beings fold their cell-layer inwards and form the primitive gut. From these, probably, the flat worms are developed, with a primitive nervous system and reproductive apparatus.

[1] *The Philosophical Basis of Evolution*, p. 2.
[2] *Through Nature to God*, p. 81.

Higher worms arise with primitive vascular and excretory systems, and at length with a rude kind of breathing apparatus. At the next stage the rudiment of a spinal cord appears, and continues to develop until the lowest vertebrates (such as the lampreys) are seen, with their primitive crania, suctorial mouths, and advancing heart. Then comes a great development of fishes with strong dermal armour and increasingly acute organs of sense. Amphibious animals link the fishes with the reptiles, which soon prowl over the earth in huge and terrible forms. Mammals, or warm, red-blooded animals, next appear in the Jurassic strata, and slowly advance through the forms of marsupials and placentals until the lowest lemurs, in the lower Eocene strata (computed to be 3,000,000 years old), bring us within dim and distant vision of the human form. The man-like apes appear in the Miocene period (about 850,000 years ago). Some 600,000 years later the *pithecanthropus*, or erect man-ape, is found to herald the approach of our own race.

Chapter V

THE ASCENT OF MAN

When the third International Zoological Congress met at Leyden in 1895 a Dutch military physician produced two or three bones that he had discovered in Java the previous year, which created a lively sensation amongst the assembled anthropologists. They were merely the skull-cap, a femur, and two teeth of some animal form that had been buried in the upper Pliocene strata nearly 500,000 years ago. The modern zoologist can reconstruct a skeleton almost from a single bone, and the complete outline of the being to which these scanty remains had belonged was quickly restored. Science found itself confronted with the long sought missing link between man and his pithecoid ancestors. The powerful form, standing five feet and a half high when erect, yet still much bent with the curve of its prone ancestors: the great cranial capacity (about 1,000 cubic centimetres), much greater than that of the largest ape, yet lower than that of man, and associated with prominent eye-brow ridges and heavy jaws; in a word, all its features pointed very emphatically to a stage halfway between man and the earlier species from which he and the apes had descended. A loud and long discussion followed Dr. Dubois' address. The celebrated Dr. Virchow stubbornly opposed the conclusion of Haeckel and his colleagues, and was driven from point to point by his opponents.[1] In the end twelve experts of the Congress gave a decision on the remains. Three of them held that they belonged to a member of a low race of man; three held that they

[1] See the account of Virchow's pitiful and transparently prejudiced resistance to evolution in Büchner's *Last Words on Materialism*, p. 97. At a scientific congress in the preceding year, one of Virchow's colleagues observed that his behaviour was "quite enough to justify us in paying serious attention no longer to the great pathologist on this question." In effect, Virchow's opinions on the matter have died with him.

had belonged to a huge man-like ape; and six were convinced that they belonged to an intermediate form, which was rightly called the *pithecanthropus erectus* (erect ape-man). The opinion of the majority has now become the general opinion in anthropology.

This was a dramatic intervention in the standing controversy with regard to the origin of man. Ever since Darwin had, as Professor Dewar says, "illumined the long unsettled horizon of human thought" with his theory of selection and descent, anthropologists had foreseen the extension of the doctrine of evolution to man. Haeckel and Darwin had soon effected that extension in theory. Now the discovery of the *pithecanthropus* came as a remarkable crown to the enormous structure of evidence in its favour. But a distinction had already been drawn between the evolution of body and the evolution of mind. Thinkers like Dr. Wallace and Dr. Mivart offered no resistance, or, indeed, strongly defended, the doctrine that man had inherited his bodily form from a lower animal species, but affected to see a gulf in mental faculty which forbade us to derive man's mind from that of any animal. Since those days the evidence for the evolution of the mind has accumulated until it is at least equivalent to that for the evolution of the body. In the *Riddle of the Universe* Professor Haeckel gives a magnificent summary of the evidence for both theses, for the development of man, mind and body, from an animal ancestor, through which he is closely related to the apes. The subject is one that belongs to the science of which Haeckel is one of the acknowledged masters. It was thought that all serious criticism of the work—all criticism that had the moral and constructive aim of ensuring the triumph of truth—would centre upon these first ten chapters dealing with evolution. The critics have acted otherwise, and we shall see that there is little serious resistance to our extension of the principle of natural evolution to man, and bringing him within the unity of the cosmos.

Let us see first, however, what is the attitude of cultivated thought generally on the subject. We have seen how the defenders of gaps have surrendered the inorganic world to the monist, how a mere handful remain to defend the dualistic theory of the origin of life, and how they have fled before the advance of the Darwinians. We shall now find that they are fast deserting this last breach in the evolutionary scheme. A quarter of a century ago Tyndall shook the world with his famous: "We claim, and we will wrest from theology, the whole domain of cosmological theory." "His successors," said Professor Dewar, in the same city, in 1902, "have no longer any need to repeat those significant words . . . The claim has been practically, though often unconsciously, conceded." Canon Aubrey Moore, whose work Mr. Ballard recommends us to read, urged his colleagues to admit the claim nearly twenty years ago. Wallace's idea, he said, "has a strangely unorthodox look. If, as a Christian believes, the higher intellect who used these laws for the creation of man, was the same God who worked in and by these same laws in creating the lower forms of life, Mr. Wallace's distinction of cause disappears." Again: "We have probably as much to learn about the soul from comparative psychology, a science which as yet scarcely exists, as we have learned about the body from comparative biology."[1] He concludes that the question has nothing to do with religion. Dr. W. N. Clarke is no less clear. "The time has come," he says, "when theology should remand the investigation of the time and manner of the origin of man to the science of anthropology with its kindred sciences, just as it now remands the time and manner of the origin of the earth to astronomy and geology . . . anthropology and its kindred sciences will give an evolutionary answer." Again: "But though there is no reason against

[1] *Science and the Faith*, pp. 203 and 211.

admitting it if it is supported by facts, special creation, whether of the spirit of man or of other new-elements of the advancing order, may come to appear improbable. The larger the sweep of one great progressive method, the more probable does it become that the method is universal. The idea of unity in God's work and method is an idea that tends, when once it has been admitted, to extend over the whole field."[1] Dr. Iverach and Mr. Newman Smyth desert the gap, and refer us to science for the solution; though, as before, we shall find Dr. Iverach raising subsequent and irrelevant difficulties. Professor Le Conte and Mr. Fiske, whom we are told to read, are emphatic evolutionists. Says Le Conte: "I believe the spirit of man *was* developed out of the *anima* or conscious principle of animals, and that this again was developed out of the lower forms of life-force, and this in its turn out of the chemical and physical forces of nature."[2] Mr. Fiske sketches a theory of natural evolution in his *Through Nature to God* (p. 94). Dr. Dallinger allows it is "not by any means other than conceivable that science may be able to demonstrate the actual physical line of man's origin" (quoted by Mr. Ballard). Even Mr. Rhondda Williams believes "evolution is complete from the jelly-fish up to Shakespeare" (p. 26), and says (p. 40): "When evolution reached man she seemed not to be content with making bodies, and devoted herself to the development of intelligence and the noblest feelings."

Haeckel is, therefore, once more in excellent and edifying company. He tells in his latest work (*Aus Insulinde*) how he found himself a few years ago face to face with the religious director of an infirmary in travelling by rail across Switzerland. Observations on the beauty of the mountains led to a discussion of their natural growth, and the nun—little suspecting his identity—informed him that she had obtained her sensible and modern views from Haeckel's *Natural History of Creation!* We shall see in the end that the religious opposition to Haeckel's teaching—his *real* teaching—is crumbling year by year. On our present question of the evolution of the human mind, one may gather from this very general agreement of the cultured defenders of Christianity that scientific and expert opinion can be little short of unanimous. Dr. Wallace, with whose views we shall deal separately, does indeed stand out with a strange obstinacy in the world of science—stands out as Virchow so long did in Germany, as Cuvier did in France—but the doctrine of the evolution of mind is now generally accepted by psychologists. Professor J. Ward says "the unanimity with which this conclusion is now accepted by biologists of every school seems to justify Darwin's confidence a quarter of a century ago."[1] Another distinguished psychologist, Professor Münsterberg, is equally scornful of those who still linger in this breach.[2] Sir W. Turner closed his Presidential address to the British Association in 1900 with a confident assumption of the general acceptance of the doctrine[3]—so far, indeed, as to evoke from a conservative writer in the *Athenæum* a lament that he "carried the evolutionary idea to its logical conclusion with a most uncompromising materialism." In fact, a cultivated and hostile reviewer in the *Manchester Guardian* dismisses the first and

[1] *An Outline of Christian Theology*, p. 225.

[2] *Evolution and Religious Thought*, p. 313. And elsewhere he says that until recently "the grounds of our belief in immortality were based largely on a supposed separateness of man from the brutes—his complete uniqueness in the whole scheme of nature. This is now no longer possible" (*The Conception of God*, p. 75).

[1] *Naturalism and Agnosticism*, ii, p. 7. Dr. Ward is speaking of the complete doctrine of development.

[2] *Psychology and Life*, p. 91.

[3] I shall quote his words presently to show that he held not only evolution, but evolution in the same sense as Haeckel. I shall also quote similar language from the speech of the President of the Anthropological section at the Congress of 1901.

chief part of Haeckel's book with an assurance that "nowadays you cannot startle even the man in the street by telling him the soul has been continuously evolved from the souls of unicellular protists." For my part, I am not prepared to assign Dr. Wallace, or even Dr. Horton, to a lower level of culture than that of the man in the street. But it would be difficult to draw up to-day even a slender list of capable biologists or anthropologists who deny the ascent of man from the rest of the animal world.

This very general agreement of scientific men, accepted, as it is, by the ablest theistic writers of the day, has a formidable support in the facts and the justified assumptions of science. Once it has been proved that the whole development of nature, from the formation of atoms up to the formation of species, has proceeded in a continuous manner; and when it is known, as we do know to-day, that this law of natural evolution applies also to the most elaborate of our thoughts and institutions, to our art, our language, and our civilisation; it becomes clear that there is so strong a presumption for the natural evolution of man that only the most explicit proof of man's uniqueness could prevent us from applying the law to explain his origin. When we find further that man is akin to the lower species in a score of ways which point to derivation, and are quite unintelligible on any other theory, the onus of proof lies heavier than ever on those who resist. We should be scientifically and logically justified in *assuming* the evolution of man, unless and until some grave hindrance is pointed out in the nature of man's structure or spiritual powers. But, as I said, the positive evidence is enormous. As far as structure is concerned we have no reply to meet. The proofs which Haeckel has marshalled so ably in Chapters II.–V. of the *Riddle* have passed unchallenged; nor is there any serious "answer by anticipation" which we should be expected to consider. The analogy of man's structure and his physiological functions with those of other mammals, the significant course of his embryological development, and the atrophied organs and muscles that are still transmitted from mother to child, have convinced a stubborn world at length. That gap has been deserted. It is still thought by some that a gulf remains between the mind of man and that of the other animals, and that here at least they still find their treasured intervention of an external power in the orderly development of the universe. They think that man's mental powers, and what he has achieved with those powers, mark him off too sharply from the psychology of the lower animals for us to admit evolution. Let us see first what distinctions are alleged in support of this assertion, and then we may study the force of the psychological evidence for evolution.

Now, when we turn to the critics of the *Riddle*—either explicit critics or critics "by anticipation"—we find we have to deal with a very meagre group of not very clear or well-informed thinkers. Such phrases as those which Mr. Blatchford quotes from a sermon delivered by Dr. Talmage as late as 1898, that the evolution of man is "contrary to the facts of science," and that "natural evolution is not upward but always downward"—only show the kind of stuff that can be safely delivered in tabernacles. Dr. Horton, another preacher, complains that Haeckel "has not been able to explain the origin of consciousness," or "how the rational life we call spirit has been produced by the physical"; which is a complete ignoring—probably ignorance—of the mass of evidence Haeckel has presented, as we shall see. Mr. Ballard hides behind the respectable figure of Dr. A. R. Wallace, though at other times he seems indesirous to press the objection. We are, in fact, left to face a medley of small points made by the Rev. Rhondda Williams (who admits the evolution of

the mind), Dr. Iverach, and the Rev. Ambrose Pope.

Mr. Pope, you will remember, holds that Haeckel collected the basic material for his system during three "half-day excursions." He himself admits the sufficiency of evolution until we come to the human mind, and then says: "This is psychology, and, like all psychologists, Haeckel starts with certain metaphysical hypotheses. His hypothesis is that mental phenomena are the effects of physical phenomena." This, he says, "looks like an innocent assumption"—to whom, we are not told—but it contains the fatal conclusion, and is "opposed by nearly every psychologist of repute in the world." These men are "expert psychologists," whereas Haeckel is only making a "half-day excursion" from his own province into "another subject entirely." One really begins to suspect that it was during "a half-day excursion" that Mr. Pope studied Haeckel. A grosser travesty of his system it would be difficult to conceive. Serious students will not expect an analysis of it, but I will briefly point out its absurdities. This subject is as much within the province of comparative zoology, of which Haeckel is one of the greatest living masters, as it is in the field of psychology. It is a border question. There was, therefore, no excursion. Indeed, it is not too much to say that this tracing of the upward growth of mind has been one of Haeckel's most absorbing studies; and now his conclusion, based on a long life of study and research, is to be flippantly represented as an "assumption" ignorantly and hastily stolen from a province "entirely" different from his own—a province, moreover, where we are assured it did not exist. Further, of the seven "psychologists of repute" whom Mr. Pope quotes—Windt (Wundt), Hoffding, Ward, Sully, Stout, Dewy, and James—six at least admit the evolution of mind by purely natural processes. I have already quoted the ablest of them, Professor Ward, as a witness to the unanimity of this conclusion.[1]

With the difficulties alleged by Dr. Iverach we will not linger. He seems not to insist on the impossibility of evolution, but urges that man is actually separated from the animals by several marked prerogatives. One of these is language; but as Dr. Iverach admits this is "manifestly a social product"—that is to say, evolved—one wonders why it is adduced at all. Another difference is in his relation to his environment, which he can modify and turn to service; that also is clearly an acquired or evolved faculty. Finally, Dr. Iverach urges man's distinction in the way of science, religion, morality, civilisation, and so on. Experts are agreed, and many theologians are with them, that these are all evolutionary products. They did not exist 300,000 years ago. Nor does Dr. Iverach seriously urge them as objections to the theory of evolution. On the other hand, Mr. Rhondda Williams, who "believes"—though it is "not proved"—that man was evolved, soul and body, makes a prolonged onslaught on Haeckel's position. Before we follow him into his storm-cloud of rhetoric, let us make clear what he hopes to gain by it. He admits the fact of evolution. He claims, of course, that the evolutionary process was divinely or pantheistically guided; a point we discuss later. The only practical question is: Does he, or does he not, admit that the agencies at work in the uplifting of the human species are the same agencies which we have hitherto dealt with? If he does, it is of no real consequence to us that he finds Haeckel's theory of consciousness or of memory at fault. The main point is the exclusion of the new kind of force which was supposed to enter the world with the human mind. It is important to remember—he seems to forget it himself sometimes—that Mr. Williams does not postulate the entrance of a new

[1] In so far as Mr. Pope means that they differ from Haeckel as to the actual relation of brain and mind we shall meet the point presently.

force into the cosmos, but, like Le Conte and Fiske, sees only a further unfolding of the universal spirit. At the bottom his quarrel with Haeckel is not about the evolution of the human soul, or the agencies which evolved it, but as to the relation of *all* soul to brain.

He promises us, then, that he is going to convict the distinguished scientist of "jugglery," and to find him in "a perfect muddle," and so on. The first "conjuring trick" is produced by a little conjuring on the preacher's own part. He cuts in two Haeckel's reference (p. 94) to "the transcendental design of the teleological philosophy of the schools," inserts a full-stop after "design," and then asks us to admire the stupidity or desperateness of a man who first excludes purpose from the universe—"in order to shut out God"—and then finds it in the organic world and calls it "mechanical teleology." If, moreover, Mr. Williams cannot see that the word "design" or "purpose" is used only in a figurative sense in the second application, he would do well to re-study the passage. A similar confusion is found in his criticism of Haeckel's treatment of consciousness and memory. He labours to prove that Haeckel must take the word memory figuratively in its lower stages—which is precisely what Haeckel obviously means. But the justification of applying the word "memory" to the function of a cell and to the human faculty lies in the whole mass of proof Haeckel has accumulated to show that they *are* the same function, and that the one passes gradually, as the nervous system develops, into the other. That is one of the most superficial truths of comparative psychology.[1] Then Mr. Williams turns to "psychoplasm" for more "conjuring." Haeckel is represented as "calling in psychoplasm to account for what protoplasm could not do"—which is false; psychoplasm being the same thing as protoplasm, but in a different relation, just as Dr. Lionel Beale speaks of "bioplasm"—and then as saying that "what springs from it is declared to be only a name for what protoplasm does." Mr. Williams foists on Haeckel a fictitious distinction, and then invites his admiring audience to make merry over the confusion it involves. Any student with a desire to understand, rather than to score rhetorical points, will see at a glance that Haeckel's terminology is perfectly consistent with itself and the facts. Protoplasm is the material substratum of all life; but when it takes on the form of nerve-tissue and becomes the base of nerve-life (which we all agree to call psychic life) it is described as psychoplasm. Just as Mr. Williams's procedure would be called clever from the intellectual point of view, but by a different name from the moral standpoint.

As a last instance of this poor "jugglery" I will quote one more passage. Haeckel, he says, "speaks of certain parts of the brain as 'the real organs of mental life; they are those highest instruments of psychic activity that produce thought and consciousness!' Look at the contradiction in that statement. Certain parts of the brain are said to be at once the *instruments* and the *producers* of consciousness! Talk about a doctor using instruments if you like, but do not talk of the instruments producing the doctor; and especially do not speak as if both statements could be true at the same time." This is a bewildering sort of

[1] We may compare Mr. Ballard's eagerness to point out that, whereas Haeckel grants *us* no souls or wills, he ascribes these even to the cells and atoms. It is the same curious and wilful misconstruction. Haeckel maintains that the force associated with the atom or the cell is the same fundamentally as that which reveals itself in our consciousness. That is the logical conclusion of all his proofs of continuous, natural development. He is, therefore, logically correct in speaking of the "soul" of the atom if we insist on speaking of the "soul" of man. The sensation and will he attributes to atoms are obviously figurative, and merely reminders of his doctrine of the unity of all force or spirit—a unity which Le Conte and Fiske and even Mr. Williams (when he is consistent) also admit.

criticism. Organs, instruments, and producers are clearly used by Haeckel in much the same sense. None but a pedant, or a desperate critic, would abuse us for saying that the stomach was the instrument and producer of digestion; certainly no one would misunderstand us. Thought is not a substantial entity like a doctor. The simile is totally misleading.

Happily, Mr. Williams finds we have arrived at last at the crucial point, and he says that it is: "Does the mind use the brain as an instrument, or does the brain really produce the mind? Haeckel's position is the latter. But do not suppose for a moment that he has any scientific proof of it." Anyone who is acquainted with modern psychology is aware that neither of the positions Mr. Williams puts is held by anybody of consequence nowadays. Spiritualist philosophers do not speak of the mind using the brain; and Haeckel, when you pay serious attention to *all* he says, does not hold that the brain produces the mind. Matter, he has said from the beginning, *never* produces force or spirit. They are two aspects of one reality, as Mr. Williams himself holds (p. 8). The sole question with Haeckel is whether this force we call the human mind is one with the force revealed in the animal mind and also in inorganic nature. That is naturally the first concern of a monist. Force, it is a truism in science, varies with its material substratum. When hydrogen and oxygen are united the resultant force has vastly different properties from what it had before. When water unites with fresh chemical substances, force takes on again a wholly new set of properties; and the more elaborate the material compound, the more elaborate the force. Protoplasm is a most highly elaborate chemical compound with a most intricate molecular structure. It is quite natural to expect the force-side of it to be very distinctive and peculiar; so we agree to connect *life* with the lower forces. But when protoplasm becomes psychoplasm, the complication greatly increases; the force varies in the same proportion. The psychoplasm or protoplasm of the higher animal brain advances still further in complexity, and, moreover, organic structure of the most intricate kind is added. Hence in the human brain, on physical principles, we must expect a manifestation of force vastly different from all that we find elsewhere. We find mind. Haeckel, on the strength of this very clear and scientific reasoning, and of all the facts as to the intimate dependence of mind on nerve-tissue which he gathers into several chapters, and all the facts as to the gradual unfolding of this force we call mind in exact correspondence to the growth in complexity of the nervous system, concludes that he sees no reason for thinking that the mind-force is specifically different from any other kind of force. I will return to this very important point presently. Meantime we see what there is in Mr. Williams's statement of Haeckel's position and his assertion that it is an idle assumption.[1]

[1] I dare not risk fatiguing the reader with a further analysis of Mr. Williams's criticisms under this head. I have treated them at some length, because this is the chief section of his criticism of Haeckel, and because, though this is the chief section of Haeckel's book, no other critic devotes more than a paragraph to it. But I will briefly point out some further instances of Mr. Williams' peculiar method. He says that, "as far as science goes," we are "quite free" to conceive the relation of mind to brain as that of "the musician and his instrument." That is gravely misleading. Science permits no such substantial independence of each other as there is between musician and organ. The only proper metaphor science would allow is the relation of music to the instrument; which is by no means so accommodating to the dualist. With the petty quibble about "truth" I will not delay. But on the next page (23) you will note how Mr. Williams quotes Haeckel's saying that "man sinks to the level of *a* placental mammal" (which no one questions, in substance), and in the next paragraph turns this into the grotesque doctrine "that human nature sinks to the level of *the lowest* placental mammal" (a very lowly beast)! Then he grumbles that Haeckel is "inconsistent in his estimates of man"; though he must know that Haeckel only belittles man relatively to the old theology. Then (p. 24), after a pedantic effort to make Haeckel say the mind of Shakespeare may have rivals in the animal world, he credits him with

Mr. Williams and his colleagues may be advised to take to heart the words of one of the ablest American psychologists, Professor Münsterberg, who is by no means a materialist. "The philosopher," he says, "who bases the hope of immortality on a theory of brain functions and enjoys the facts which cannot be physiologically explained, stands, it seems to me, on the same ground with the astronomer who seeks with his telescope for a place in the universe where no space exists, and where there would be undisturbed room for God and eternal bodiless souls."[1] All this criticism is neither more nor less than an attempt to defend gaps. If Mr. Williams replies that it is rather an attempt to point out gaps in Haeckel's system, the reply is obvious. The essence of Haeckel's system is monistic or negative. Any positive theories he may advance as to the relation of brain to memory or cell to consciousness are scientific theories, grounded on the best available evidence, but not final and unchangeable. If they prove inadequate, or if fresh facts discountenance them, they will be modified. But the essential part of his position remains. "The whole momentum of our knowledge of biological continuities," as Mr. Newman Smyth says, the whole momentum of our knowledge of cosmic processes, indeed, impels us to suppose the human mind was evolved. Where are the obstacles to such an assumption? Where are the specifically different—not merely *very* different, but different in kind—contents of the human mind which forbid us to suppose it? They are disappearing one by one as the sciences of comparative psychology and comparative philology and comparative sociology and comparative ethics and religion unfold their several stories. Everything has been evolved. To talk blandly of the "vast difference" between mind and matter is "an appeal to the imagination" and "an insult to the understanding," says Mr. Mallock. He goes on to censure the dishonest practice of contrasting the mind of the highest man with that of the lower animals. That is not truth-seeking. The truth-seeker will take the highest animal intelligence (as discovered by the observations of Darwin, Romanes, Lloyd-Morgan, Lubbock, and so many others) and the lowest human intelligence (as seen in the Veddahs or Bushmen, or as indicated by prehistoric human skulls) and ask himself whether he finds here a gulf which evolution could not be supposed to have bridged in something like 500,000 years. But if animals have the germ, ask some, why can you not raise one to a higher level? Setting aside the actual results of training, let us ask: Did it, on the theistic-evolution theory of man's origin, take God 300,000 years or more to raise the highest animal species to the miserable level man occupied 50,000 or 100,000 years ago? And do you ask man to do more than this in a year or two?

But, though it is well to remember that the essence of Haeckel's position is the reasoned exclusion of any new force, we are bound to give serious attention to the positive evidence he has accumulated. The verbal quibbles of Mr. Williams have not touched the structure of evidence given in Chaps. VII.–X. of the *Riddle*, and no other critic is in the field. To resume it briefly, we have a fourfold gradation of psychic force, or a fourfold exhibition of the growth of mind. In the first place, we may arrange all known organisms, from the moneron

the opinion that the difference between the mind of Plato and the animal is "slighter in every respect than that between the anthropoid ape and a bird"; whereas Haeckel had said "between the higher and the lower animal souls," which may mean the gorilla and the amœba. Then he finds a difference between the animal and the human embryo in the fact that the embryo will become a man and "the highest animal never will"; which is begging the whole question whether the highest animal has not actually done so. Such is the farrago of rhetoric opposed to us as the only and adequate reply to the most important section of the *Riddle*.

[1] *Psychology and Life*, p. 91.

to man, in a scale of mental faculty, or vital faculty leading up to mental, and we find a sensibly graduated development of mind, corresponding rigidly to the growth of structure in complexity. In the second place, we study the growth of the individual human mind from the impregnated ovum, and we find the same gradual formation of nerve and brain and the same proportionate unfolding of consciousness. In the third place, we learn from palæontology that living things have been developed from each other in the order in which the zoologist arranges his subjects, and which is confidently anticipated by the embryologist. In the fourth place, if we arrange the brains of all known men in a similar hierarchic scale, we find the same rigid correspondence of function and structure, or of mind-action and brain. Then there are supplementary and complementary lines of research. There is the life of the sub-conscious self, which Professor James says is a great world we are only just beginning to explore. Already the explorations show conscious action to be only a small area of mental action; the larger area is mostly mechanical, and the conscious area passes gradually into it and out of it. As Mr. Mallock says: "The human mind, like an iceberg which floats with most of its bulk submerged, from its first day to its last, has more of itself below the level of consciousness than ever appears above it." There are the facts of double and abnormal consciousness, the various kinds of mental paralysis resulting from lesion of the brain, the phenomena of somnambulism and narcotic action and artificial unconsciousness. There are the voluminous determinations of psycho-physics as to the exact correspondence between purely physical and chemical changes in the brain and changes in thought or emotion. There are the zealous investigations of the modern students of child-life and child-brain, showing the same exact relation of development. And there are the most recent and largely successful efforts to localise mental functions in different parts of the brain.

Now, let us be perfectly clear what this enormous mass of convergent evidence really means. When we study the stomach or the lungs in comparative zoology, and perceive the close correspondence, from the lowest to the highest forms, of structure and function, we do not dream of concluding only that the two have a very close connection: we say at once that they are in the relation of organ and its function: we say that the digestive force or the respiratory-force is the same throughout, and we can at the lowest end of the scale connect it with ordinary natural forces. Yet when we have this stupendous mass of evidence converging along a dozen lines to the conclusion that the mind-force is continuous throughout the animal kingdom, and is rigidly and absolutely bound up, as far as every particle of scientific evidence goes, with the nerve-structure, and is, at the lower end, continuous with the ordinary force of the universe, we are told we must draw no conclusion whatever. We are asked to believe that this mass of scientific evidence is quite consistent with a belief that some extraneous force, distinct in kind from the ordinary force of the cosmos, is "using" the nerve-tissue to manifest itself; and that the highly complex force which must result from the intricate molecular texture of the human brain is nowhere discoverable. On scientific principles "these facts," as Mr. Mallock says, "totally destroy the foundation of the theist's arguments." They teach us that, as he says again, "each mother who has watched with pride, as something peculiar and original, the growth of her child's mind, from the days of the cradle to the days of the first lesson-book, has really been watching, compressed into a few brief years, the stupendous process which began in the darkest abyss of time and connects our thoughts, like our bodies, with the primary living substance—whether this

be wholly identical with what we call matter or no."[1] If it were not for the presence amongst us of certain religious traditions about the nature of man's "soul," or mind-force, no scientist would ever hesitate for a moment to draw a conclusion which would be justified by every canon of logic and science—the conclusion that in this vast hierarchy of facts we see the world-force ascending upwards until it grows self-conscious in the human brain. Haeckel's attitude is the strictly and purely scientific attitude.

But, it is further urged, this is only a description of the manner of growth, not of the causes. "Thus," says Professor Case, "in presence of the problem which is the *crux* of materialism, the origin of consciousness, he first propounds a gratuitous hypothesis that everything has mind, and then gives up the origin of conscious mind after all." I have explained in what sense Haeckel attributes mind to "everything"—though a skilled metaphysician might be expected to see that. To the second point I reply that the whole of this evidence is an explanation of the origin of mind. The whole evidence points to the conclusion that conscious mind is an outgrowth of unconscious, and that this is the generally diffused cosmic force. But you cannot derive the conscious from the unconscious, say several critics. The objection is childish. If we are to explain anything, as Sir A. Rücker said, we cannot explain it in terms of itself: the conscious *must* be derived from the unconscious. And as a fact, Mr. Mallock points out, you do get consciousness out of the unconscious every day—in the growth of the infant; or, as Lloyd Morgan puts it, in the development of the chicken from the egg. In any case, the critics plead, you are only saying *how* and not *why* mind was evolved. Now, in so far as this is a plea for teleology, we remand it, as before. If it is anything more than this, it is a plea for gaps and breaches in the mechanical scheme of the universe, building fallaciously (as usual) on the present imperfection of science. Take the development of the embryo. We certainly can do little more as yet than describe its stages. But no one now doubts it is a mechanical process. The assumption that some non-mechanical force was grouping and marshalling the molecules of protoplasm, according to a design of which it was itself totally unconscious, only plunges us in deeper mysteries than ever. Moreover, the facts of heredity, the transmission of bodily marks and features and peculiarities, point wholly to a mechanical or bodily action. The development of the mind on a cosmic scale is still more clearly mechanical. There is not a single fact that compels us to go outside of the range of familiar cosmic forces to seek an explanation.

I will add one or two illustrations from recent science to show how its progress tends more and more to confirm Haeckel's position. Sir W. Turner closed his presidential address to the British Association three years ago with these words (which were duly censured as "materialism"): "At last man came into existence. His nerve-energy, in addition to regulating the processes in his economy which he possesses in common with animals, was endowed with higher powers. When translated into psychical activity, it has enabled him throughout the ages to progress from the condition of a rude savage to an advanced stage of civilisation." Thus is the very language of Haeckel used on our supreme scientific solemnity. The following year Professor D. J. Cunningham (M.D., D.Sc., LL.D., D.C.L., F.R.S.) was the president of the Anthropological Section of the Congress, and his presidential address was devoted to "the part which the human brain has played in the evolution of man." The whole speech was a vindication of the purely mechanical explanation of the rise of man. Instead of

[1] *Religion as a Credible Doctrine*, p. 77. The last phrase is superfluous. No one "wholly identifies" the primary living substance with "matter." Matter and force are two aspects of it, as brain and mind are.

seeking the influence of external powers, Professor Cunningham looks for more prosaic changes that may have led to the segregation of man. The reader who is only accustomed to rhetorical and spiritualistic treatment of the theme will learn with a shock that the mere formation of a habit of setting the hands free for other purposes than locomotion probably had a profound effect on the brain and intelligence. "So important is the part played by the human hand as an agent of the mind, and so perfectly is it adjusted with reference to this office, that there are many who think that the first great start which man obtained on the path which has led to his higher development was given by the setting of the upper limb free from the duty of acting as an organ of support and locomotion." It hardly needed divine intervention or guidance to suggest this change. The hand-centre in the brain is located in such a region that its development must react on the thought-centre. Further it is "the acquisition of speech which has been a dominant factor in determining the high development of the human brain." The centre for facial expression is contiguous to that of the hand, and, as communication began to grow between the primitive men, much facial expression would be used, giving a still further stimulus to the brain. In fine, not only is language shown by the philologist to be an evolutionary product, but the physiologist finds that the distinctive structures in the human brain (though they may occasionally be fairly traced in the brain of the anthropoid ape) which are connected with speech are the outcome of "a slow evolutionary growth." Thus is science coming to determine the physiological line of evolution which gave the first distinction of brain-power, on which natural selection has fastened so effectively.[1]

Thus are the mechanical methods of science bridging the supposed gulf. There is no longer serious ground for claiming a unique position for man, and it is not surprising to find the leading theologians sounding the retreat once more. We are, in fact, beginning to realise that the dualist theory of man never did afford any "explanation" of anything. The connection of soul and body was always incomprehensible;[1] nor is there the slightest intellectual satisfaction in covering up the whole mystery of the mind with a label bearing the word "spirit." Psychology has deserted its old ways and become a science. The theologians will do well not to wait until they are again ignominiously splashed by the advancing tide of scientific research. Their efforts to "show cause" why we should not apply the mechanical process of evolution (whether divinely guided or not) to the growth of man have hopelessly failed.

But before we leave the question it is necessary to consider for a moment the question of the liberty of the will. Here Haeckel's opponents are content to appeal to what Emerson calls "the cowardly doctrine of consequences." We shall consider the moral outlook of a monistic world in a later chapter, but

[1] Let me quote Professor Cunningham's conclusion: "Assuming that the acquisition of speech has afforded the chief stimulus to the general development of the brain, thereby giving it a rank high above any other factor which has operated in the evolution of man, it would be wrong to lose sight of the fact that the first step in this upward movement must have been taken by the brain itself. Some cerebral variation—probably trifling and insignificant at the start, and yet pregnant with the most far-reaching possibilities—has in the stem-form of man contributed that condition which has rendered speech possible. This variation, strengthened and fostered by natural selection, has in the end led to the great double result of a large brain with wide and extensive association-areas and articulate speech, the two results being brought about by the mutual reaction of the one process on the other."

[1] Compare Professor Herbert's desperate predicament in his *Modern Realism Examined*, which we are urged to read: "We may regard the material world as real, but if we do we must deny the existence of all but Creative Intelligence. . . . If the material world is as it *seems*, it contains no minds" (p. 148). Mr. Mallock points all this out to Father Maher very forcibly in his *Religion as a Credible Doctrine*.

may observe in passing that all this kind of reasoning is futile and insincere. It will not make the least practical difference to life whether psychologists do or do not agree to leave unimpaired the old formula of "the liberty of the will." A man can control his actions to a great extent, and will to that extent be responsible for them. On that we have the witness of consciousness. How this apparent power of choice arises in a mechanism like the mind we can hardly expect to understand until the new psychology has made some progress. But the old idea of a "self-determining power of the will" is now "an unthinkable conception," as Dr. Croll (who is on the list of the sound scientists) emphatically says. Mr. Mallock also thinks that "every attempt to escape from the determinism of science by analysis or by observation is fruitless." No sooner do we begin to look closely into our free-will than we find the supposed area of its action shrinking rapidly: we find ourselves in a perfect network of determining influences. Our will is the slave to our desire; we cannot will what we do not desire, nor what we desire the least or the less. Our desire can always be traced to our circumstances, our education, our character and temperament. And our character and temperament — here modern science has had a great deal to say—are determined by heredity and environment. The attempt to break through this network with a cry of alarm about consequences is futile. There will be no practical consequences of an evil character; and the consequences for good of the scientific attack on the old doctrine, from the days of Robert Owen down, have been incalculable. The community is a self-conscious determinism. Now that it knows how much heredity and environment have to do with character and desire, and with the healthy balancing of desires, it will take action. The whole of education and social reform have benefited enormously by the overthrow of the old scholastic notion of the will. Such "freedom" as we now find we have—if we may still use the word—is not different in kind from that which a cat or a dog evinces every day.

We conclude, then, that Haeckel's opponents have shown no plausible reason why evolution should not extend to the origin of man. The great achievements which distinguish man to-day from the animal world—art, science, philosophy, religion, civilisation, language—are known to have been formed, from very rudimentary beginnings, by a long process of evolution. At their root, in the men whose skulls and bones and rude implements are unearthed to-day, we find only a somewhat more elaborate brain, with deeper furrows and more convolutions, a somewhat higher grade of intelligence and emotion, than in the higher animals about us. There is no gulf, no gap: but there is a period of some 300,000 years for natural selection to work in. Comparative anatomy is beginning to trace the steps—quite natural, if not at first casual, steps—by which man ascended in this direction. A chance variation in the use of the limbs could, it seems, greatly stimulate the most important part of the brain. Any increase of brain-power would prove of enormous advantage, and would be "selected" and emphasised at once. In any case the momentum of continuity and the mass of evidence for actual continuity are enormous. It is no less scientific than philosophical to see in the growth of the human mind a further extension of the life-force of the cosmos, a further embodiment of the great matter-force reality which unfolds itself in the universe about us and in the wonderful self-conscious mechanism of the mind.

CHAPTER VI

THE IMMORTALITY OF THE SOUL

UNTIL a few centuries ago a belief in the immortality of the soul harmonised so well with the prevailing conception of the world at large that men were content with but slender rational proof of it. Even then, it is true, the tragedy of death seemed to the eye so final—the curtain seemed to be rung down so inexorably on the conscious soul—that sceptics were not wanting. The Sadducees amongst the Hebrews, the Epicureans amongst the Greeks, and the *materiarii* of early Christian times, rejected the belief entirely. Some of the ablest of the mediæval schoolmen (such as Duns Scotus) went so far as to deny that any rational proof could be devised in support of the belief. But for most men the belief was credible enough, and not unwelcome. Immortality was a familiar idea to them. Not only God and the angels had that prerogative, but the very stars they looked on night by night were believed to be of immortal texture. In a world where the immortal outnumbered the mortal, man could well convince himself that the tradition of his own immortality was true.

But the world has grown into a universe to-day, and from end to end of it comes only the whisper of death. The stars, that had been regarded as fragments of immortal fire, are known to be hastening to a sure extinction. The moon stands close to us always as a calm prophet of death. Such as it is, the corpse of a world, will our earth one day be. Such will our sun finally become; and after him, or with him, the hundred millions of his fellows in the firmament. Countless dead worlds already lie on the paths of heaven; and the millions that are yet unborn will have the same fate. Man now sees in the universe at large no shadow of support for that promise of unending life he has entertained so long.

> "What! shall the dateless worlds in dust be blown
> Back to the unremembered and unknown,
> And this frail Thou—the flame of yesterday—
> Burn on forlorn, immortal, and unknown?"

Death is the law of all things. It is true that the great reality that shapes itself in a million forms never dies. That is *its* first law. But of every single embodiment of its restless energy, of every individual being that pours out of its womb, the path is measured and the fate is written.

> "Life lives on.
> It is the lives, the lives, the lives, that die."

So the position of the belief in personal immortality has changed. The pretty thoughts that supported it, or accompanied it, in the mind of a Plato or an Augustine, crumble beneath the burden some would lay on them to-day. The cosmic odds are against it. It is now the assumption of a stupendous privilege on the part of one inhabitant of the universe, who flatters himself he is exempted from the general law of death. We look up now to no immortal stars for reassurance as we turn sadly from the truthful face of the dead. The angels have retreated far from the ways of humanity. God has shrunk into an intangible cosmic principle. If belief in immortality is to be anything more than a despairing trust, it must appeal to the presence in man of some unique power and promise. But we have seen that modern science completely discredits the "supposed separateness of man from the brutes," to use the words

of Le Conte. The thinking force in him is the same force that reveals itself in the industry and ingenuity of the ant or the affection of the dog. Why shall it survive the corruption of the brain in his case, yet in their case die away as surely as the light dies when the sun sets? It would seem that it is not so much a question of examining Haeckel's disproofs, as of asking where we are to look for the ground of this stupendous claim.

We shall fully consider both points in the light of the criticisms passed on Haeckel's chapter on immortality and the works on the subject which are opposed to him. The actual criticisms will detain us very little, for an obvious reason. Haeckel has already destroyed the ground for any claim of a unique character of the human mind. We have seen with how little success his opponents have tried to impede or retard his progress from point to point of the evolutionary scheme. The very latest researches of science confirm his theses. The ablest Christian apologists yield their arms and desert the long-defended breaches. We have been borne along by the flood of scientific evidence, philosophically considered, as far as the closing thesis of our last chapter. Man is the latest and highest embodiment of the universal matter-force reality. It would seem that the acceptance of this thesis is equivalent to an abandonment of the belief in immortality, but we shall see that evolutionists like Fiske, and Le Conte, and Mr. Newman Smyth still erect feeble barriers. Meantime, let us dispose of the less advanced critics; those who reflect the ideas of the average church-goer and strive to offer some defence of them.

There is Dr. Horton, for instance, who pleads much for "the naïve, but essentially correct, conceptions of our ancestors." Dr. Horton seems to think it most effective to urge that men who do not share the belief in God and immortality live on "bestial levels," and are "shrunk in soul, warped in mind, and degraded in body." The "intellectual strain" of Haeckel's scientific work is kindly said to relieve him personally from these consequences, but one gathers that we who are not great scientists fall under Dr. Horton's merciless logic. "Accustom yourselves," he says, "to believe that God and freedom and immortality are hallucinations; accustom yourselves to the idea that this stupendous order of being in which we live is not a rational order at all, but the mere fortuitous concourse of atoms [!], and by an inevitable logic, as our anarchist friends see, when you have got rid of the first lie, which is God, you quickly get rid of the second lie, which is righteousness, and then you get rid of all the other lies, which are love, and truth, and peace, and joy, and civilisation and progress generally, and poetry, and life." We will not stay here to discuss this insincere rhetoric. It is too great a libel on Dr. Horton himself, if we take it seriously, and too insulting to the intelligence of his readers—who, one may assume, happen to know a few agnostics. Nor need we be detained with the various criticisms in *Light*. The chief of these articles states that Haeckel relies on "physics" to disprove the immortality of the soul; more curiously still, a second writer in *Light* (Jan. 19th, 1901) *does* rely on physics (the conservation of energy) to rehabilitate the belief. The second writer, moreover, completely ignoring Haeckel's deliberate words, assures his readers that he "is terrified at the thought of life beyond the grave," and adopts the grotesque title of "A Frightened Philosopher." We shall not get much light from that side.

Most of the critics we have already passed, attempting loyally to defend one or other of the supposed breaches in the evolutionary doctrine, so that they make little resistance here. When, in the course of the next ten years, they have fallen back on this last position—probably discovering that, on theological principles, man *must* have been evolved

—they will begin to repeat the arguments of Fiske and Le Conte, which we shall presently consider. But there are several critics who, setting aside the question of evolution as not essential to defend, formulate their objection thus. Science proves up to the hilt that brain and mind are correlative. As brain develops, the mind opens—and in strictest proportion. Lesion or other affection of the brain proportionately mars the mental or emotional life. Psycho-physical observations show that the intensity of brain-action quite corresponds to the intensity of mind-action. Let us grant all this. But, they say, all this throws no light whatever on the question whether the mind may not outlive the brain. "It's logic!" exclaims Mr. Brierley, contemptuously, when he comes to this part of Haeckel's scheme. Mr. Williams and Dr. Horton, and others, make the same reply. Indeed, as accomplished rhetoricians, they offer Haeckel a pretty figurative way of conceiving the relation, which may help his sluggish imagination and correct his logic. Mind-action is like the music a master evokes from the piano or violin. A musical instrument maker would, like the psycho-physicist, find an exact correspondence between the ailments and defects of the violin and the disorders of the music, or between the violence of the molecules of string and wood and the intensity and tone of the music. But—Haeckel has forgotten the player! Brain and thought are instrument and music. Where, in Haeckel's philosophy, is the instrumentalist?

A very singular omission on the part of one of the keenest observers in the world! Let us examine the matter. We have seen in the preceding chapter the immense mass of scientific evidence which goes to show that there is an exact correspondence between brain-action and soul-life. The correspondence is just the same in man as in the ape or the dog. As the shadow varies with the object which projects it, so does thought vary with the quality and action of the brain. There is no dispute about this. No induction is based on a wider and more varied range of observations. This correspondence is the same as we find in the case of the heart and its function, the stomach and digestion, or the lungs and respiration. Now, in all these analogous cases we do not seek an instrumentalist. The instrument is automatic. For its formation we look back along a process of natural evolution which stretches over 50,000,000 years. Whether the evolutionary agencies were divinely guided or no will be considered presently, but at all events in the heart and lungs we have automatic instruments, and we never dream of looking for a present instrumentalist. It is the same with the brain of the dog. When the dog dies, we do not ask what has become of the instrumentalist now that the instrument (brain) is broken and the music (thought) is silent. We never dream of there being a third element. But the mind of man is the same mind more fully developed.

In a sense there is a third factor—both in the stomach, the canine life, and the human life—and this is the only truth there really is in this very misleading figure of rhetoric. I have already mentioned a critic who endeavours to deduce the immortality of the soul from the conservation of energy, and this gives us the clue. Critics very stupidly, or very wilfully, represent Haeckel as saying that thought is a movement of the molecules of the brain, just as they say he resolves all things into matter. They ignore the fact that he lays as much, if not more, stress on force than on matter. He holds, of course, that there is fundamentally only one reality, but it is most improper to call that by the name of *one* of its attributes (extension). Thus we have, in a sense, three elements: the instrument, the music, and the soul or energy associated with the brain. When Haeckel speaks of thought as "a function of the brain," he means the *living* brain—the incomparably intricate structure of material elements and

the natural forces associated with them, in which thought arises. We have no scientific or philosophical ground whatever for postulating any further element to explain the music. Is it scientific to make an exception of this living brain, and say it is the only non-automatic organ in the body? Does its relation to the rest of the body give the least support to the notion? Is it scientific to say the living brain is automatic in the whole animal world, but cannot be so in man because the music is finer and more difficult? Does embryology favour the idea? Does philosophy step in, and bid us suspend the scientific method and admit a breach in the scientific continuity?

Probably it is to philosophy they will appeal. These ideas, Dr. Horton says, "rest on the region of thought and consciousness" to which Haeckel "studiously closes his eyes." By all means let us go to philosophy. Kant will tell us that these psychological proofs of immortality are quite discredited. Schelling and Hegel and Schopenhauer will give us the consolation of disappearing in the world-process. Hume and Mill and Spencer will prove more than sceptical. Most modern philosophers will tell us, as Münsterberg does, that "the philosopher who bases his hope of immortality on a theory of brain-functions . . . stands on the same ground as the astronomer who seeks with his telescope for a place in the universe where no space exists, and where there would be undisturbed room for God and eternal bodiless souls." Certainly one can quote thinkers who wish mind and brain movements to be left parallel, with the relation of the two undetermined. But they advance no reasons which arrest the application of scientific method. Here in the mind-life are phenomena that we can examine from two sides—from without and from within. This may seem at first to give a certain uniqueness to the soul-life. But the only soul-life we can examine from within is our own individual experience. Every other man's soul is a matter of objective examination to us; and by much of the same evidence which convinces us of his similar experiences, we are forced to extend conscious mental action to the brutes. So the uniqueness once more disappears. Philosophy will not help or hinder us. Referring to the work of Professor Royce, a distinguished American philosopher and Gifford Lecturer, Professor Le Conte says: "He gives up the question of immortality as insoluble by philosophy. Well—perhaps it is."[1]

Thus (reserving some further philosophic arguments for the moment) we return unembarrassed to our scientific procedure; and "science," Prof. Münsterberg says, "opposes to any doctrine of individual immortality an unbroken and impregnable barrier."[2] The rigid relation determined by psycho-physics, the rigid relation observed in the evolution of the thinking animal, the rigid relation that is recorded by pathology and ethnology, and that lies on the very surface of life, means something more than parallelism. It is easy to quote Huxley and Tyndall in opposition to Haeckel's formula. The one was an idealist in metaphysics; the other has said much more in the monistic sense than he ever said in the agnostic. Proceeding on realistic and scientific lines, we are driven by the rules of induction to regard thought as wholly bound up with brain, and to look for no third element beyond the matter and force of which the brain is so intricately constructed. The mysteries that still linger about consciousness and memory, just as about embryonic development, for instance, are *scientific* mysteries. To build on them would be to repeat the discredited old tactics. If the theories of them which Haeckel offers are unsatisfactory, wait for better ones. They are the light bridges of the monistic system, forecasting the scientific advance. But that, in whatever way, mind-force *is* an evolution of the general cosmic-force.

[1] *The Conception of God*, p. 75.
[2] *Psychology and Life*, p. 85.

and that it therefore affords no more promise of immortality in the individual human mind than it does in the individual motor-car, is a scientific induction resting on a mass of evidence and drawn up in observance of the most rigid rules.

Let us now consider the arguments brought forward in favour of the belief in immortality by those who have not lingered to defend any evolutionary gap, but who freely admit the evolution of the human mind. These are the "replies by anticipation" which, we are told, should have withheld Professor Haeckel from his extreme conclusions. Let us see how puny and fruitless are the efforts they make to overleap the "unbroken and impregnable barrier" that Professor Münsterberg speaks of. Münsterberg himself offers a curious example of the way modern philosophers, especially idealist philosophers, lend a nominal support to religious doctrines, yet are found to mean something totally different from what the world at large understands by those doctrines. As the words I have quoted show, he is as hostile as Haeckel to any belief in personal immortality. "Only to a cheap curiosity," he says again, "can it appear desirable that the inner life, viewed as a series of psychological facts shall go on and on"; and again: "The claim that the deceased spirits go on with psychological existence is a violation of the ethical belief in immortality."[1] Thus he rejects the only notion of immortality which is in any plausible way connected with those moral consequences that are so much urged upon us. However, he speaks of an "ethical belief in immortality," and so is gathered by controversialists into the imposing category of "scientists opposed to Haeckel." The immortality he promises us is no more consoling than that offered by Comte or by Haeckel himself. "Life lives on." It is a natural expression of his idealism. "For the philosophic mind," he says, "which sees the difference between reality and psychological transformation, immortality is certain; for him the denial of immortality would be even quite meaningless. Death is a biological phenomenon in the world of objects in time; how then can death reach a reality which is not an object but an attitude, and therefore neither in time nor space?" He meets the scientific evidence by getting rid of the body and death, and the material world altogether.

Professor W. James, another able American psychologist whom Mr. Ballard and Mr. Williams and several ecclesiastical papers urge us to read, has made his profession of faith at the close of his recent Gifford Lectures, published under the title of *Varieties of Religious Experience*. We shall see that it does not include a belief in God. On our present question it is little more helpful to the Christian. Professor James is convinced as a spiritist that there are non-human intelligences in existence, but he is not yet convinced that these external intelligences are the souls of men and women who have "passed beyond." So far he lends no real support to the doctrine of immortality. Professor J. Royce, another distinguished American thinker whom the Gifford Trust has invited amongst us, "gives up the question of immortality as insoluble by philosophy"; so Professor Le Conte assures us.

Mr. Le Conte himself, we saw, follows this statement with a candid admission that "perhaps it is." But he is not disposed to yield entirely as yet. Where does so thorough an evolutionist find ground for ascribing this unique prerogative to the human soul? He professes to find it precisely in the "evolutionary view of man's origin." If that view of the world-process which we have hitherto sustained is correct, it follows, he says, that the human mind-force is "a spark of the Divine Energy" and a "part of God." So is the force of a motor car, on his principles. But, he says, the universal

[1] *Psychology and Life*, p. 280.

spirit (Haeckel's universal substance on its force side) has worked its way upward through the hierarchy of evolution, so that it (or God) "may have, in man, something not only to contemplate, but also to love and to be loved by"; and in view of that project, which is not supposed to be a temporary project, man must be immortal.[1] The frailty of the position is obvious. It assumes that the "Divine Energy" (which is Haeckel's substance) was intelligent and had "designs" from the beginning. We shall consider the grounds of this assumption in the next chapter. But, granting it for the sake of the argument, we are asked to conceive this eternally intelligent principle going through a laborious process of evolution in order to reach consciousness in the human mind and admire itself, and love and be loved by itself, in that form; for the mind *is* God, on these pantheistic principles. Moreover, supposing that we could gather this remarkable project, it contains no promise whatever of immortality for the individual; the "Divine Energy" is incarnated in so many forms, and will be throughout the eternal world-process, that the perishing of one form or of one world will hardly diminish its contemplation or its admiration. Further, if man *is* God, how comes he to be ignorant of the project? What becomes (theoretically) of moral distinctions? But this fantastic theory bristles with difficulties.

Mr. Fiske's conclusion is very similar to Professor Le Conte's, as will be expected from the similarity of his premises. The doctrine of evolution, he says, does not destroy our hope of immortality. "Haeckel's opinion was never reached through a scientific study of evolution, and it is nothing but an echo from the French speculation of the eighteenth century"; and "he takes his opinion on such matters ready-made from Ludwig Büchner, who is simply an echo of the eighteenth century atheist La Mettrie."[1] How Fiske could ever pen such an egregious statement about either Haeckel or Büchner is one of the mysteries of religious controversy. After our review of Haeckel's arguments it may very well be ignored. And when Fiske has come to the end of this petty and petulant criticism of Haeckel we find him presenting a conclusion almost less satisfactory than that of Le Conte. The substance of his argument is that "there is in man a psychic element identical in nature with that which is eternal" (p. 170). On the face of it, that is just what Haeckel says. Man's mind-force is a little eddy or focus in the eternal cosmic force. There is no ground whatever for assuming that *as* such it will be eternal, and will not simply sink back into the eternal stream, like all other temporary concentrations. The only difference is that Fiske takes the eternal principle to be conscious and intelligent from the first—a point we discuss in the next chapter.

There remains only the argumentation of Mr. Newman Smyth in his able but pathetic attempt to reconstruct Christian belief on a scientific base.[2] The argument itself is an old one, but it is put with some freshness. He points out that the evolutionary process has just reached an important stage. Evolving nature has at length passed beyond mere animal life and reached the threshold of the spiritual life. Since, then, we discern an upward purpose in evolution, it is impossible to suppose that the process will end now that so promising a stage has been reached. To this we need only reply that, whether or no "purpose" is discernible in nature (which we shall deny), this further evolution will take place in the race taken collectively. This is so clear that Mr. Smyth makes a desperate effort to apply his argument to the individual. He says the "last word of organic development is the individual

[1] *The Conception of God*, p. 77.

[1] *Through Nature to God*, p. 144.

[2] *Through Science to Faith*, p. 265 and foll.

and his worth," and he appeals to "nature's increasing estimate of individuality in comparison with the species." Now, if we take this in the only sense in which it could be conceived to help a belief in personal immortality, it is totally opposed to the scientific evidence. The only way in which nature seems more concerned about the individual is in the perfection which she gives to the individuals of the later species; but this is absolutely necessary if the species itself is to advance. In all other respects nature, as ever, is indifferent to the individual—or, for the matter of that, if we take a long enough perspective, to the species itself.

The supplementary consideration which Mr. Smyth submits is still feebler. He contends that, though evolution is generally continuous, it shows what he calls "critical periods." He instances the changes which take place in a drop of water as it sinks to freezing-point or rises to the point of evaporation. He thinks science does not preclude the possibility of some analogous "critical period" for the human soul. Nay, he says, getting bolder, biology favours such a view. Look how "very slight and easily changed" is the connection between mind and organism at certain times—at conception, in sleep, and when we near death. Biology, he says, shows that "the mind does not need for its birth and its coming to its inheritance a whole body, a complete brain, a fully-formed organ of sense, or so much as a single nerve; a few microscopic threads of chromatin matter in the egg are enough." Hence, if at both ends of life the bond that links mind and body can wear so thin, it is conceivable that it may be dispensed with altogether. Now, this is a most perverse piece of reasoning. At conception, and long after conception, we have no right to say that the mind is there at all. It appears and grows with the brain—that is all the evidence says. The facts point to a conclusion diametrically opposed to that of Mr. Smyth. They show complete and slavish dependence. As to heredity, it is gratuitous to say it is the mind, and not the body, that inherits. Even Dr. W. N. Clarke (who, with many modern theologians, does not believe that the "soul" is transmitted from parent to child) says the facts of heredity point to the mechanical, not the spiritual, theory. At death we see the same rigid dependence of mind on organism, instead of finding anything like a token of an independent mind. The mind flickers and goes out—as far as evidence goes—in exact proportion to the last spluttering and extinction of the physical life of the body. At both ends of life, as throughout its course, the correlation of mind-action and brain-action is rigid and absolute. And, finally, what Mr. Smyth unfortunately calls "critical periods" in nature have not the least analogy to the notion of the mind-force existing apart from its material substratum. A different grouping of the water-molecules naturally gives rise to different properties; so does a different grouping of brain-molecules (in fever, under opium, &c.) give rise to different mental qualities. When we find a case of the properties or forces of a substance parting company from, or changing independently of, the material substratum, we shall have found some ground in nature for the conception of a disembodied soul; but not until then.

Such are the feeble defences which are to-day set up by the apologists who have scientific attainments in the Christian body. On the strength of these ethereal speculations we are asked to resist the weight of the scientific evidence as to the relation of body and soul, and to admit for man a privilege that is unknown from end to end of the universe. We are asked to believe that with the aid of a fantastic and desperate philosophy such as this we can overleap science's "unbroken and impregnable barrier." We are asked to call Haeckel "an atrophied soul" and "a child in spiritual reasoning" because he will not abdicate his scientific method and

procedure in the face of such speculations as these. I have not, it is true, examined the argument for a future life from the alleged exigencies of the moral order; but this is little urged to-day, and we shall see, when we come to deal with the monistic ethics, that it rests on a false conception of moral law,[1]

I have sought, in particular, and stated with perfect fidelity, the arguments of those modern scholars who are opposed to him as being equally informed in science and equally convinced of evolution. The reader may judge whether he or they are the more philosophic, logical, and scientific in procedure.

CHAPTER VII

GOD

WE now enter upon a new and almost the final stage of our direct vindication of monism. If we have succeeded so far in warding off the objections which have been urged against Haeckel's position, if we have shown that the very latest scientific research increasingly confirms his position, it is clear that we have covered considerable ground. We have discerned in the stupendous process of cosmic evolution the growth or the unfolding of one great reality that lies across the immeasurable space of the universe. An illimitable substance, revealing itself to us as matter and force (or spirit), is dimly perceived at the root of this evolution as a simple and homogeneous medium (prothyl), associated with an equally homogeneous force. Then the continuous prothyl, by a process not yet determined, forms into what are virtually or really discrete and separate particles —electrons: the electrons unite to build atoms of various sizes and structures, and the rich variety of the chemical elements is given, the base of an incalculable number of combinations and forms of matter. Meantime the more concentrated (ponderable) elements gather into cosmic masses under the influence of the force associated with them: the force evolving and differentiating at equal pace with the matter (with which it is one in reality). Nebulæ are formed: solar systems grow like crystals from them: planets take on solid crusts, with enveloping oceans and atmospheres. Presently a more elaborate combination of material elements, protoplasm, with—naturally—a more elaborate force-side, makes its appearance, and organic evolution sets in. The little cellules cling together and form tissue-animals, which increase in complexity and organisation and centralisation until the human frame is

[1] Neither have I, it will be noted, referred to the empirical or spiritistic evidence for the persistence of mind, which gains increasing favour to-day. This is not due to any lack of respect for the distinguished scientists who have admitted such evidence, or for the sobriety and judgment of so many about us to-day who receive it. It is due to the utter futility of discussing evidence of this kind. It is of such a nature, resting so largely on delicate moral considerations, that it must in my opinion be left entirely to personal examination in the concrete. But that Haeckel is right in saying the subject is obscured with much fraud and triviality is admitted, not only by life-long students like Mr. Podmore, but by many earnest spiritists.

produced, the life-force growing more elaborate with the structure, until it issues in the remarkable properties of the human mind.

The tracing of this picture is the ideal that science set itself a quarter of a century ago. The success has been swift and astounding. We are still, as Sir A. Rücker said, living in the twilight; but no man of science now doubts that what we *do* see is the real outline of the universe and its growth. But other and different cosmic speculations held the field, and these were ultimately connected with the powerful corporations and the intense emotions of religion. As science advanced theology began a long process of adaptation to the new thought. The ambition of science was to cover the whole ground with a scheme of mechanical and orderly explanation, because the instinct of science felt that the universe was an orderly and continuous structure. The ambition of the theologian was to detect and exult over gaps and breaches in this mechanical scheme, and introduce his supernatural agencies by means of them. We have seen that many of the ablest theistic apologists of our day (Ward, Smyth, Le Conte, Fiske, Clarke, &c.)—almost all, indeed, of those who have scientific equipment—grant the ability of science, now or in the near future, to cover "the whole cosmological domain" with its network of mechanical causation. We have seen that there is a general disavowal of "a theology of gaps" or of the desire to build on the temporary ignorance of science. But a few heroic souls still linger in the familiar trenches, and we have fully considered what they have to say. With Smyth, Le Conte, and Fiske, we have been forced to conclude that so far we have seen in the cosmic process the orderly unfolding of one sole all-diffused matter-force reality, which we commonly call Nature.

But we have throughout, for the sake of clearer procedure, reserved one consideration that these advanced evolutionists have been urging on us at every step—that is to say, the claim that the evolutionary process must have been intelligently set going and intelligently directed. Haeckel is quite right, they say, in claiming that science can give or adumbrate a mechanical interpretation of the whole process. Quibbles about his particular way of conceiving the first formation of life, or of consciousness, and so on, are irrelevant and distressing to the serious thinkers, as is the diversion of the issue by discussing his taste, or his knowledge of history, or his optimism or pessimism. The important point is that he has proved his case so far in its essentials. But he must now meet this last position of his opponents. Was this monistic cosmic process conceived and designed from the beginning, and guided throughout, by an intelligent being, or no?[1] This is the question of the hour, and especially of the coming hour, in apologetics. As I write a journal reaches me containing an interview with Mr. Ballard. Asked whether he thinks "the rehabilitation of religion would come from the scientists," he replies: "I think that the theistic basis of Christianity will have scientific support more than ever. Modern science is pledged to evolution, and Christianity can only be justified scientifically on evolutionary lines." And Professor Le Conte says: "Here is the last line of defence to the supporters of supernaturalism in the realm of Nature . . . it is evident that a yielding here implies not a mere shifting of line, but a change of base: not a readjustment of details only, but *a reconstruction of Christian theology*. This, I believe, is indeed necessary."[2] And we have already seen passages from Ward and others to the same effect.

Here is a dramatic simplification of the controversy, which every thinker

[1] Let us note in passing that this is not necessarily a question of monism or dualism. Mr. R. Williams and others expressly state they are monists, that God is not distinct from Nature. More about this presently.

[2] *Evolution and Religious Thought*, p. 295.

will welcome. Theology will, as before, spread itself over the whole cosmos, but it will be with the repetition of a single formula. There will no longer be ceaseless quarrels as to whether science can explain this or that phenomenon with its natural or mechanical causes. The new attitude is that this mechanical explanation is precisely the work of science, and if it cannot give a mechanical explanation of a thing—say, consciousness—to-day, we will wait patiently till to-morrow. But, the new theologians say, we want to know in addition how these mechanical causes came to co-operate in producing such remarkable structures. With this science has nothing to do, so we close our thirty years' war and sign an eternal truce. Nay, if we look at the matter rightly, these theologians of the twentieth century say it is very desirable that science *should* complete its mechanical interpretation of the cosmos. An automatic universe, evolving by inherent forces from electrons to minds, would be the most marvellous mechanism ever conceived. The mind would be *forced* to look for the engineer. Those ancient theologians who scoffed at Tyndall for his Belfast address were too hasty; so were those who caused Huxley to compare their dread of the mechanical scheme to the terror of savages during an eclipse of the sun; so are those who beat their wings in vain against Haeckel's structure to-day. The materialist will be the truest auxiliary of the theist. If he can only show that the universe is the unfolding of one form of matter and one force (or one matter-force reality), he has put before us one of the most stupendous machines that ever bore the mark of intelligence.

We are then, it seems, approaching the psychological moment in the great drama of the conflict of science and religion. That I am indicating a true tendency will be perfectly clear from the preceding chapters. We have rarely found men of ability or of complete scientific equipment defending the old trenches that barred the advance of the mechanical system of science. We have constantly heard impatient denials of a love for "gaps." But before I proceed to show how Haeckel has met this teleological position, let me quote a few recent writers, both to show that the formula is as simple as I said, and that concentration on this position is the order of the day.[1] I have quoted Professor Ward's opinion that, "if there has been any interference in the cosmic process, it must have been before the process began." Dr. Croll, in his *Basis of Evolution*, distinguishes between producing (mechanical) and determining (directive) forces, and tells the theologian of the future to confine his attention to the latter: "The grand, the difficult, though as yet unanswered, question is this: What guides the molecule to its proper position in relation to the end which it has to serve?" With Mr. Newman Smyth the supreme question is: "Is evolution without guidance or with guidance?" Mr. Fiske says: "There is in every earnest thinker a craving after a final cause . . . and this craving can no more be extinguished than our belief in objective reality."[2] Dr. Dallinger says that, if the mechanical philosophy is true we have "a more majestic design than all the thinkers of the past had ever dreamed." And the sermon preached on the last Association Sunday at Southport by the Bishop of Ripon points unmistakably to the same tendency—even to a pantheistic identification of God with the forces at work in Nature.

[1] There may be a few fond and admiring souls who are looking out for a reference to Mr. Ambrose Pope's third criticism. Briefly, he finds that Haeckel has got rid of God by a third "half-day excursion," in the course of which he discovered a system of "physiological monism," which, as before, contains the fatal germ under an innocent exterior. The joke may be given for what it is worth, but it gets stale. Mr. Pope goes on to say that when you ask Haeckel about the substance he puts instead of God, he says he is not sure whether it exists. Tableau, and exeunt omnes, of course. We have met this point in the second chapter.

[2] *The Idea of God*, p. 137

The new teleology flatters itself it differs very scientifically from the old; for "teleology" had fallen into disrepute during the period of "gap" theology which followed the break-up of Paleyism. It is true that there are differences. Aubrey Moore points out that we now do not forget the past (the evolution) of the organ. Dr. Iverach observes that the new teleologist does not think so much of an "external artificer" as of an immanent directive principle, and that we do not now attempt to deduce scientific knowledge from the "purpose" of a thing. These differences, however, do not alter the essential structure of the argument, which remains the same as when Kant rejected it and Paley drove it to death. We may state it briefly in abstract form to this effect: Wherever in Nature we find several agencies co-operating in the production of a certain result which is orderly or beautiful, we see the guidance of mind. The underlying assumption is that the unconscious forces of the universe will only produce chaos unless they are guided. Pre-conceived design followed up by directive control, or else a "fortuitous clash of atoms," is the alternative put before us. The process of evolution taken as a whole has been so orderly, and had such marvellous results, that we must admit the agencies at work in the process were intelligently guided. To suppose that this process should *chance* to culminate in the appearance of man is said to be incredible. So throughout the whole process we find co-operations, adaptations, orderly and beautiful operations, which speak eloquently of design and control. From the very first step, the making of the atom, to the last, the making of man's brain, we see the finger of God.

A few extracts and references will show that this is a correct summary. As regards the inorganic universe a little work recently published by the Rev. W. Profeit well illustrates the argument. The author starts with the principle that "every form of being must act according to its nature," and goes on to say that "the particles of matter have not in them conscious intelligence, and consequently have not of themselves the power of arranging, and so of producing complex order."[1] He then reviews the teaching of modern physics at length, pausing at every few paces, in the familiar manner, to admire the ways of the Creator. "To deal with every particle of matter in the universe, so as to make it of a special type, to order all, so that they might come under types so few and compact, demanded an amount of thought and work of overwhelming greatness, and could not be the result of chance." Chemistry is "crowded with adjustments, packed with adaptations." The moulding of matter into solar systems of such marvellous symmetry and adaptability to life occasions another outburst. In short, theology can easily run to volumes by repeating "Great are thy works" at every forward step in evolution. Chance is out of the question. "Ah! what foolery it is to deem that a mighty world has been produced by chance." Happily, there are no fools of that particular type amongst us. But "necessity" is equally impotent. "No sane mind"—the young theology keeps up the literary tradition, you see, which made even Fiske exclaim against "the intellectual arrogance which the arguments of theologians show, lurking beneath their expressions of humility"[2]—"no sane mind can for a moment imagine that from the nature of things it was an eternal necessity that the seventy, or thereby, different kinds of atoms should all exist, or be formed in the numbers and proportions of numbers, in which they help to form our great system obeying the orb of day." So it is to be either "fortuitous concourse" or mind; and as the universe is not a chaotic mess, we must admit it was presided over by intelligence from the first.

Dr. Dallinger offers us the same

[1] *The Creation of Matter*, p. 6.
[2] *Outlines of Cosmic Philosophy*, p. 451.

dilemma of chance or control, and urges that to adopt chance "is surely to trifle with the fundamental principles of our reasoning powers." Rationalists, we may say in passing, had a concern for our "reasoning powers" in days when doctors of divinity looked upon them as mischievous. Dr. Croll argues in the same way. Some principle, he says, must determine why a natural force takes direction *A* instead of direction *B* or *C*. The determination of planetary orbits is not so much due to gravitation as to the *way* in which gravitation acted. So in the formation of crystals or organisms. "Out of the infinite number of different paths, what is it that directs the force to select the right path?" Dr. Croll seems to fancy that in this he has suggested a new idea to the world. Dr. Iverach, both in *Christianity and Evolution* and in *Theism*, follows the same line. For the pre-atomic mass to be made atomic, and to produce the orderly and periodic system of elements with their affinities, the forces at work must have been guided.

The argument does not differ in substance when we pass to the organic world, but, naturally, the notes of exclamation and edifying observations increase. Biological science, says Dr. Iverach, "must admit purpose in the magnificent adjustments it points out." Mr. Newman Smyth gives an admirable sketch of the evolution of the eye, and pleads that the forces which have gradually constructed it did not any the less need guidance and control because they took millions of years to do it. Mr. Ballard takes the evolution of the eye in the fœtus, and says that if a child were to repeat "that God caused it so to do, it is utterly beyond the power of all modern science to contradict."[1] Embryology is, it is true, as yet very imperfect. However, other passages make it clear that, though Mr. Ballard may here be building on a "gap," he generally offers us the usual dilemma, design or "fortuitous concourse of atoms," and characteristically tells us the latter is "fatuous." In fact Mr. Ballard tells even the agnostic, who thinks there is not enough evidence either for or against teleology, that his hesitation is mere "childish fatuity." The Rev. R. Williams—not to neglect him—tells his weaver-admirers that "the solar system is really more wonderful than a loom," which is obviously designed, and that organisms are more wonderful still. And Dr. W. N. Clarke says "it is not probable that the most significant elements in a world came into it without having been entertained during the process as character-giving ideals." He says Darwinism has modified, but not destroyed, teleology. We now know that needs, and contrivances to supply them, "grow up within the universe," but this power of adaptation must have been given to organisms by a purposive intelligence.[1]

The argument, therefore, on which the fate of theism is finally to be determined is now tolerably clear. Leave Haeckel free to perfect his mechanical monism; when he has completed it, we shall point out to the astonished professor that he has been proving the existence of God all the time. If this force which he traces for us in its marvellous ascent through the atom, the nebula, the cell, and the organism, was unconscious from the start, and if it has achieved all this progress in so orderly and determined a fashion, it must have been guided. Well, let us see whether Haeckel *is* quite so naïve and antiquated as these good people assure the world.

To begin with, the flavour of antiquity is quite clearly on the other side. "Chance" and "fortuitous concourse of atoms" are phrases which you will not find outside theological schools for the last 2,000 years. The early Greeks used them. The constant reiteration of them in our time is a grave piece of insincerity, or else ignorance. How Mr,

[1] *Miracles of Unbelief*, p. 51.

[1] *Outlines of Christian Theology*, p. 116,

Profeit and Mr. Ballard come to use these phrases in the year of grace 1903 is best known to themselves. Professor Haeckel deals clearly with the point (p. 97), and explains—as has been explained innumerable times—the only sense in which science admits "chance" events. Mr. Profeit rightly indicates a third alternative, necessity; and Dr. Dallinger somewhat vaguely suggests it. Haeckel and his colleagues hold that the direction which the evolutionary agencies take is not "fortuitous": that they never could take but the one direction which they have actually taken. A stone has not a dozen possible paths to travel by when you drop it from your hand. You do not seek any reason why it follows direction *A* instead of direction *B* or *C*. So it is, says the monist, with all the forces in the universe. Some day science will be able to trace a set of forces working for ages at the construction of a solar system, or at the making of an eye. The theist says the ultimate object must have been foreseen and the forces must have been guided, or they would never have worked steadily in this definite direction. The monist says that these forces no more needed guiding than a tramcar does; there was only one direction possible for them. Here is a clear issue, and in the present state of apologetics, an important one. It is useless to talk, as Fiske does, of the "teleological instinct." "The teleological instinct in man," he says, "cannot be suppressed or ignored. The human soul shrinks from the thought that it is without kith or kin in all this wide universe." This is not only "an appeal to the imagination": it is utterly opposed to the facts of life. Mr. Fiske ascribes his own peculiar temperament to the universe. The matter must be reasoned out.

Now, it seems clear that if a man asserts that the forces of the universe are naturally erratic, and may go in any one of a dozen directions unless they are guided, he must show cause for his opinion. The man of science has never discovered an erratic force yet. Force always acts uniformly, always takes the same direction. If you say this is *only* because the natural forces are guided and controlled, and is not their proper and inherent nature, the man of science naturally asks: How do you know? Science sees nothing in nature to suggest such an idea. "When we consider the movements of the starry heavens to-day," says Mr. Mallock, "instead of feeling it to be wonderful that they are absolutely regular, we should feel it to be wonderful if they were ever anything else . . . We realise that order, instead of being the marvel of the universe, is the indispensable condition of its existence—that it is a physical platitude, not a divine paradox."[1] That is certainly the feeling the universe inspires in men of science. What *is* the ground for this notion of the essentially erratic character of natural forces? One seeks it quite in vain. Dr. Croll says: "Though our acquaintance with the forces of nature were absolutely perfect, the question as to how particles or molecules arrange themselves into organic forms would probably still remain as deep a mystery as ever, unless we knew something more than force."[2] But he does not offer us a single consideration to convince us of this "probability." When Mr. Profeit tries to bully us into admitting that "no sane mind can for a moment imagine that from the nature of things it was an eternal necessity that the seventy, or thereby, different kinds of atoms should all exist," we timidly venture to inquire: Why not? Force, as far as our experience goes, acts necessarily, inevitably, infallibly. There could be no science if it did not.

The only attempt made to escape this initial difficulty of the teleologist is to appeal to a number of totally false analogies. The favourite is that venerable and imposing sophism, that if you cast to the ground an infinite (or a finite) number of letters, they might after

[1] *Religion as a Credible Doctrine*, p. 162.
[2] *The Basis of Evolution*, p. 24.

infinite gyrations make a word here and there, but we should think the man an enthusiast who expected even a short sentence, and a fool if he expected them ever to make a poem. It is absurd to offer us this as an analogy to-day; or else it is begging the whole question. Take the case of the eye. Quite certainly this is an evolutionary product. Forces acting on matter during millions of years have evolved it. Each step in the process is perfectly complete and intelligible in itself. It is wholly arbitrary to suppose the eye was in view when protoplasm was first formed: or when the first sensitive cells appeared on the surface of the primitive animal body: or when pigment-cells were developed at the foremost part of the body: or when a sensitive nerve was formed under the skin; and so on. Each structure was useful in its turn; and on that very account natural selection fastened on it. It is sheer imagination to suppose that the ultimate form *was* foreseen: and it is sheer scientific untruth to say the ultimate form *must* have been foreseen or else the earlier structures would be unintelligible. Here is a plexus of natural forces acting on matter, without, as far as we can see, the possibility of their acting otherwise; only one result was possible. And we are asked to regard this as curious, because, in the case of the imaginary throw of type, natural forces will not lose their uniform character and act miraculously. Finally, it is a colossal *petitio principii*, because the question is precisely whether Virgil's *Aeneid* or Shakespeare's *Hamlet* is *not* an evolutionary product.

It seems, then, that the initial difficulty of the teleologist is insuperable. He cannot give us a shadow of proof of his assertion that natural forces are erratic. Haeckel is completely within the right of science in speaking of the universe as, in Goethe's phrase, "ruled by eternal, iron laws" (or forces). They have wrought out a certain result—the world we form part of. Until some good reason is shown for thinking they could have acted otherwise, we see no need for designer, or guide, or engineer. Let us put it another way. To an extent the teleologists are playing on the present imperfection of science, as Dr. Croll innocently betrayed. Let us take them at their word, and suppose science will in time give a complete mechanical explanation of everything, for the good reason that God, as they say, created a machine that needed no mending or re-starting. And let us suppose that he designed the ultimate form of the cosmos. Is this design communicated to the unconscious atoms and their forces? Clearly not; no one would say that. Are these forces which build up and impel the atoms supernaturally inflected or modulated at each step? Again, no one would say this. The only possible conception of telic action on a cosmic scale is, when we descend from grandiose phrases to practical ideas, that from the start the matter-force reality was of such a nature that it would infallibly evolve into the cosmos we form part of to-day. Any other conception of "guidance" and "control" is totally unthinkable. And as a fact theists are settling down to formulate their position in that way. The interference, as Ward says, took place before the process began.

But before we take up this last point it is necessary to glance at another side of the question. Haeckel has pointed out that, not only do we see no ground for believing in the presence of some primitive design, but we see very considerable reasons for rejecting it. The world is crowded with features which forbid us lightly to admit a controlling supreme intelligence. There is no answer to this. "The fact stands inexorably before us," says Mr. Fiske, "that a Supreme Will, enlightened by perfect intelligence and possessed of infinite power, might differently have fashioned the universe, though in ways inconceivable by us, so that the suffering and the waste of life which characterise nature's process of evolution might have been

avoided."[1] As to the waste, Dr. Iverach ventures to say that "infinite precision at one point is inconsistent with bad shooting"; but the infinite precision is, we have seen, an assumption, whereas the bad shooting is ubiquitous. At every sex-act millions of spermatozoa are wasted. Others say the glorious final issue puts all right. But as Mr. Mallock says, "Whatever may be God's future, there will still remain His past." Most teleologists retreat into mystery. One might unkindly remind them of their great disinclination to let the monist leave anything unexplained, but it is better to say that when all the tangible evidence is on one side and none on the other, we do not regard it as a fair dilemma. Listen to the impression of a cultured defender of religion after a study of the evolutionary process in nature: "We must divest ourselves of all foregone conclusions, of all question-begging reverences, and look the facts of the universe steadily in the face. If theists will but do this, what they will see will astonish them. They will see that if there is anything at the back of this vast process with a consciousness and a purpose in any way resembling our own—a Being who knows what He wants and is doing his best to get it—he is, instead of a holy and all-wise God, a scatter-brained, semi-powerful, semi-impotent monster. They will recognise as clearly as they ever did the old familiar facts which seemed to them evidences of God's wisdom, love, and goodness; but they will find that these facts, when taken in connection with the others, only supply us with a standard in the nature of this Being himself by which most of his acts are exhibited to us as those of a criminal madman. If he had been blind, he had not had sin; but if we maintain that he can see, then his sin remains. Habitually a bungler as he is, and callous when not actively cruel, we are forced to regard him, when he seems to exhibit benevolence, as, not divinely benevolent, but merely weak and capricious, like a boy who fondles a kitten, and the next moment sets a dog at it. And not only does his moral character fall from him bit by bit, but his dignity disappears also. The orderly processes of the stars and the larger phenomena of nature are suggestive of nothing so much as a wearisome Court ceremonial surrounding a king who is unable to understand or to break away from it; whilst the thunder and whirlwind, which have from time immemorial been accepted as special revelations of his awful power and majesty, suggest, if they suggest anything of a personal character at all, merely some blackguardly larrikin kicking up his heels in the clouds, not perhaps bent on mischief, but indifferent to the fact that he is causing it. . . . A God who could have been deliberately guilty of them [the evolutionary processes] would be a God too absurd, too monstrous, too mad to be credible."[1]

No one who has studied biological evolution can fail to recognise these facts. They make it impossible for us to see a divine presence and guidance at least *during* the process. The only plausible theory is that God set the machine going and left it to itself. If we hold that he is guiding molecules to "their proper place" in the construction of the tiger's eye, we must hold that he has some control of the molecules in the cruelty-centre of the tiger's brain. A universe without carnivora is conceivable enough. Professor Kennedy and others would divert us from a consideration of these facts to contemplate the beauty and sublimity the universe exhibits. But the beauty of the starry heavens is only the effect of distance and position; the beauty of the Bay of Naples could be

[1] *Outlines of Cosmic Philosophy*, p. 462.

[1] Mr. W. H. Mallock, *Religion as a Credible Doctrine*, p. 177. Mr. Mallock has throughout life been one of the ablest opponents of agnosticism, and he has been nothing less than scornful of a profession of atheism. Does he not see how natural and logical atheism seems when one sweeps aside all theistic proof on the one hand, and recognises these dark features of the universe on the other?

shown by science to be a purely accidental outcome of the action of natural agencies. The beauty of the diatoms that are brought from the lowest depths of the ocean, the beauty of the radiolaria that swarm about the coast, and the beauty of a thousand minute animal structures, are obviously not designed and purposed beauties. They were unknown until the microscope was invented: the polariscope reveals yet further beauties: the telescope yet more. The idea of these things being designed for our, or for God's, entertainment belongs, as Mr. Mallock says, "to a pre-scientific age . . . an age which had realised the spectacular unity of the cosmos, but had very imperfectly realised the nature of its mechanical unity: and which, moreover, had never grasped the fact that the forces in virtue of which material things move, such as energy, attraction, repulsion, and chemical affinity, are as much a part of the material things themselves, and as much amenable to scientific experiment, as extension, or shape, or mass, or softness, or hardness, or visibility." Once more we are thrown back on the efficient, mechanical, producing causes.

The point we have reached, then, is this: the notion that molecules are "guided" to their "proper position" by any other than a mechanical force—the notion of "guidance" or "control" *during* the cosmic process is unproved, is unthinkable when examined in detail, and is opposed by an appalling mass of facts (waste, cruelty, suffering, &c.). It starts from an assumption—the assumption that natural forces are erratic in action—for which it does not offer any justification, and which is directly opposed to scientific experience. It rests on a number of fallacious analogies and poetical expressions, on a fallacious application of the term "blind" to natural forces, and on the as yet imperfect condition of our scientific knowledge of the construction of organisms. All that remains, then, is to examine the position of the really consistent evolutionary theist, who does not build his belief on the temporary ignorance of the scientist. This position, to which all apologists are tending, is that "the only interference was before the cosmic process began": that God created a matter-force reality in the beginning of such a nature that it should evolve spontaneously into the universe we know and of which we are a part. This is the ideal and final position of the apologist. Science will drive him back pitilessly decade by decade until he adopts it. Many of the best-informed apologists already adopt it.

Let us see, then, where Haeckel and what remains of his opponents are now. Both admit that the universe is a mechanical system, a great machine that has worked from the first without control, in virtue of its inherent character. But the dualists say such a machine must have been most skilfully designed and constructed: it is, in Dallinger's words, "a more majestic design than all the thinkers of the past had ever dreamed"—and therefore it will commend itself more and more to theists. The position is—it is very important to understand clearly—that God only creates any particular content of the universe—say Plato's mind—in the sense that he imparted to the primitive nebula, or ultimate prothyl, a natural force to evolve it. The germ of everything, the capacity to evolve everything, is in the great matter-force reality. Now, we have seen in the third chapter that "science points to no beginning." It is perfectly consistent with the scientific evidence to say that the universe is eternal. We saw that those who attack Haeckel's ascription of infinity and eternity[1] to the basic substance show no cause why he should not proceed candidly on the astronomical evidence. No better evidence is forth-

[1] Note the remarkably different treatment of Haeckel and Mr. Spencer. Mr. Spencer's First Cause cannot be distinguished from Haeckel's. Yet when he speaks of it with capital letters, as an Infinite and Eternal Power, we hear nothing but admiration.

coming here. Dr. Croll says: "If any man should affirm that the succession of events had no beginning, but has been in operation from all eternity, it would be difficult indeed to prove him to be in the wrong; but, on the other hand, it would be far more difficult, nay, utterly impossible, for him to prove his assertion."[1] But, as we saw, the scientific evidence and the rules of logic and truth-seeking put the burden of proof distinctly on the man who asserts there was a beginning. Professor Ward attempts to infer a beginning from the theory of entropy; but we saw that this is discredited by the latest pronouncements of physicists. "Our experience," as Professor Ward says himself elsewhere, "certainly does not embrace the totality of things; is, in fact, ridiculously far from it"; and so entropy is a "ridiculously" hasty conclusion. . . .

No, there is no proof whatever that the machine ever *began* to exist at all. As far as we can see, it has eternally possessed those forces and properties with which we have agreed to credit it, and has been eternally evolving them. And, as a fact, apologists are rapidly moving on to the identification of God with Nature, which means an abandonment of the idea of creation. A curious symptom falls under my notice as I write. An editorial article in the *Daily News*, the distinguished organ of the Nonconformist Churches, commenting on the Bishop of Ripon's sermon at Southport, endeavours to reconcile science and religion. The laws of science, it says, reveal the working of force, and it goes on to ask: "What is that power? May it not be the synthesis of all the various forces and vitalities which the universe contains; and may not that synthesis be God?" That is precisely what Haeckel says; in fact, in a late German edition of the *Riddle* he calls his system "the purest monotheism." So close are we to "reunion"! Take, again, the *Anticipations* of Mr. H. G. Wells. Looking about on the cultured thought of our time, he says that before the end of this century educated men will have ceased to believe in "an omniscient mind"—"the last vestige of that barbaric theology which regarded God as a vigorous but uncertain old gentleman with a beard and an inordinate lust for praise and propitiation"—and a supreme "moralist" and prayer; and will know God only as "a general atmosphere of imperfectly apprehended purpose." Mr. Rhondda Williams assures us that "it is not for dualism I am arguing. I believe in the unity of the world, and a kind of monism is probably the truest solution of the riddle; but I must find the unity in spirit, not in matter." That means, if it means anything, not only a complete misconception of Haeckel, but an identification of God with Nature. Professor Le Conte says: "God may be conceived as self-sundering his energy, and setting over against Himself a part as Nature. A part of this part, by a process of evolution, individuates itself more and more, and finally completes its individuation and self-activity in the soul of man. . . . Thus an effluence from the Divine Person flows downward through Nature to rise again by evolution to recognition of, and communion with, its own source. . . . And the sole purpose of this progressive individuation of the Divine Energy by evolution is finally to have, in man, something not only to contemplate, but also to love and be loved by."[1] In another place he says: "The forces of Nature are naught else than different forms of one omnipresent Divine energy or will," and "In a word, according to this view, there is no real efficient force but spirit, and no real independent existence but God."[2] We have seen how Mr. Fiske

[1] *The Basis of Evolution*, p. 167.

[1] *The Conception of God*, p. 77. Le Conte tells us, moreover, that he is almost using the language of another "theistic" writer, Mr. Upton, the Hibbert lecturer.

[2] *Evolution and Religious Thought*, p. 301. He frankly allows that he is here close to the opinions of Berkeley, and even Swedenborg.

claims immortality on the ground that "there is in man a psychic element identical in nature with that which is eternal"; and man's psychic element is, he allows, an evolutionary outcome of natural force. Professor Royce, a recent Gifford lecturer and distinguished American thinker, says, when he comes to distinguish man from God: "We therefore need not conceive the eternal Ethical Individual, however partial he may be, as in any sense less in the grade of complication of his activity or in the multitude of his acts of will than is the Absolute. . . . It may be conceived as a Part equal to the whole, and finally united, as such equal, to the Whole wherein it dwells."[1] Professor W. James, another Gifford lecturer, rejects the title of theist altogether, and says "we must bid a definite good-bye to dogmatic theology." The metaphysical attributes of God (omnipotence, omniscience, omnipresence, eternity, &c.) are, he thinks, "destitute of all intelligible significance," and "the metaphysical monster they offer to our mind is an absolutely worthless invention of the scholarly mind."[2]

We are advancing rapidly. To this does a knowledge of science bring the theologian. It is true that some of these evolutionary theists, like Mr. Rhondda Williams, regard it as a great gain that science has destroyed the idea of a "transcendent" God and forced theology to recognise his "immanence" in nature. This is very misleading. The "immanence" of God in nature has been consistently taught in Roman Catholic theology for the last thousand years. You will not find a single Roman Catholic theologian who locates God outside the universe. It is a commonplace with them that God is more closely present in every part of nature than ether is, for instance. Nor do the great Anglican divines speak differently. What, then is the new feature? It is that these modern apologists have been driven to deny that there is any real distinction between God and nature. They talk of God "sundering" himself and of nature being "part" of his substance—which has a strange resemblance to various ancient and mouldy Oriental speculations (Brahmanic, Gnostic, and Manichean)—but the gist of their position is that God and nature are one. God is the "pervading spirit" and the "unifying force" of the cosmos, or the "Eternal and Infinite Energy" behind phenomena, as Sir Henry Thompson puts it. This is the kind of theology which generally lies at the back of the few theistic utterances which our anxious bishops can wring out of men of science to-day. It is the last page of a remarkable history. Man's first idea of deity was animistic and pantheistic, according to one school of hierologists. In the course of ages the shape of God was disentangled from visible nature and dramatically set against it. Now God slowly sinks again into the life of nature. Great Pan is alive once more.

How does this position compare with that of Haeckel? We will not be so rude as to suggest that if Haeckel used capital letters, like Mr. Spencer, they would greet him as a brother. Nor, on the other hand, can we admit that, as Mr. Williams claims, *they* find the unity of the universe in spirit, while Haeckel bases it on matter. We saw that Haeckel does nothing of the kind. Matter and spirit are to him two aspects of one reality, and the unity of the cosmos is the unity of that reality. Spirit-force or energy emerging finally as human thought-force is admitted by Haeckel as freely as by Mr. Williams. An idealist like Ward would very naturally say that the unity of the world consists in spirit, but we assume Mr. Williams admits the existence of matter and corporeal fellow-creatures. But there is one further sense in which the unity of the world could be said to

[1] *The World and the Individual*, vol. ii, p. 451.

[2] *Varieties of Religious Experience*, pp. 445-8. He adds that the "moral attributes" are just as indefensible.

consist in spirit, and in this lies the final difference between Haeckel and his critics on these cosmic speculations. These theistic, or rather pantheistic, monists hold that the cosmic energy is essentially and from the beginning, or from eternity, conscious and intelligent. Haeckel holds that consciousness only arises when a certain stage of nerve-formation appears. What evidence do they offer for this? We may note in passing that, when the real difference between Haeckel and those scientific writers who are the most zealously pitted against him is so small, it would have been better for his critics to say so outright. The average reader who wades through the surging flood of rhetoric will probably learn with astonishment that the chief champions of reasoned Christianity to-day stand so close to Haeckel's position that only one frail metaphysical bridge divides them. Let us examine this last division.

It is clear, in the first place, that the evidence for the position of these evolutionary theists is not of a scientific nature. Science does not find intelligence in the cosmos until a fairly advanced stage of animal organisation is reached. In fact, science finds consciousness so completely and rigidly bound up with nerve-structure that it can only listen with astonishment to the theory of a vast consciousness existing apart from nerve-structure and before it was developed. One wonders, therefore, what Mr. Ballard means when he assured his anxious interviewer that "the theistic basis of Christianity will have scientific support more than ever." The reasons alleged for postulating this intelligence at the "beginning" of things are metaphysical. Mr. Rhondda Williams formulates them more or less clearly, as they are invented by Dr. W. N. Clarke and Dr. Ward and Le Conte. He says first—and this, I believe, is an original contribution—that science finds "law" in the cosmos; but "law" is a mental concept: ergo, science finds mind in the cosmos. We will overlook that little weakness, and come to the plausible arguments he has borrowed. He says (after Ward) that the universe must be the work of intelligence because it is intelligible. The axiom he rests on is that "what is intelligible must either be intelligent or have intelligence behind it." Now, on idealist principles this is quite true; there being no material world at all, if anything exists, mind clearly exists. But, apart from this denial of a real world, the axiom has no sense whatever; it is simply an audacious assertion. Dr Iverach (*Theism*) uses much the same argument, and tries to give it a respectable realistic air. "A system," he says, "which at this end needs an intelligence to understand it must have something to do with intelligence at the other." Many other writers say the same. To show the inanity of the assertion, one has only to ask Dr. Iverach whether even a chaotic and disorderly universe would not need "an intelligence to understand it." If he means by "intelligible" that it is orderly and systematic, he is simply begging the whole question, and asking us to swallow his position in the form of an axiom, because he cannot prove it. He says elsewhere (*Christianity and Evolution*) that "if thought has come out of the universe, if the universe is a universe that can be thought, then thought has had something to do with it from the outset." That is the favourite form of argument that "you cannot get out of a sack what is not in it." It is a long-discredited fallacy. We have seen how out of a simple matter and force have come an immense variety of things. These things were only *implicitly* in the primitive prothyl. Similarly, the evolution of thought only shows that thought was implicitly in the first cosmic principles. Moreover, consciousness evolves out of the unconscious every day—in embryonic development. Mr. Williams finally urges that a thing which has not been made by intelligence should be

reversible, and says: "But it is the essential principle of science that things are not reversible; that they must be where they are, as they are; the *order* of nature is the greatest scientific discovery." This is a curious confusion. It is difficult to see why a thing constructed by mechanical forces should be *immediately* reversible, in any sense which does not apply to an intelligent construction; and *in the long run* the cosmic process *will* be reversed, and begun again, if the scientific evidence counts for anything.

It is on the strength of such verbiage and sophistry as this that Haeckel's critics assume airs of spiritual superiority and spatter his "godless" system with contempt. He has followed up the scientific evidence with a close fidelity. He has not forgotten for a moment that the unseen may be gathered from the seen by valid reasoning (as he himself has gathered many truths by inference from the facts observed); he has not excluded the sober and accredited use of the speculative imagination. Professor Henslow has recently, in a letter to the daily Press, suggested that Rationalists deny the existence of God because it does not fall under observation or experiment. The writer Professor Henslow quoted has himself repudiated this interpretation of his words; and certainly Haeckel has repeatedly endorsed the procedure of passing beyond observation, when the inference is firmly based on the facts and is logical in form. Whether he is not justified in rejecting as unsound these pseudo-metaphysical arguments we have been considering, the reader may judge for himself. Whether his procedure is not more scientific, more logical, and more philosophical than that of his opponents—whose arguments I have, as far as possible, given in their own words—may now be determined. And if his procedure so far is correct, and the objections of his critics futile, we have established the bases of monism. We have followed the great matter-force reality through its cosmic development until it breaks out in the glory of the human mind and emotions. And we have seen no reason for suspecting the existence of any principle or agency distinct from it, or for ascribing to Nature itself any feature that would justify us in transferring to it the title or prerogatives of the dying God.

CHAPTER VIII

SCIENCE AND CHRISTIANITY

As we have previously seen, the cosmic speculations of the Monist find themselves in antagonism with a set of cosmic speculations which already occupy, not merely the mind, but the heart of a large number of people. Whilst older religions, such as Confucianism and, to an extent, Buddhism, have succeeded in effecting a separation between ancient cosmological notions and religion proper, so that the educated Japanese, for instance, does not confound theistic controversy with religion, Christianity has retained the belief that man is immortal, and that the universe has a supreme controller as essential parts of its framework. Naturally, Christian thinkers who are alert and informed are

beginning to deny this. Mr. R. J. Campbell, for instance, insists that Christianity is "not dogma, but life—a life lived in conscious union with a Divine Person." But that is somewhat bewildering. In one phrase dogma is disavowed, and in the next a dogma of an appallingly metaphysical character is made essential to the definition. A similar inconsistency is found in almost every other ecclesiastic who speaks of removing the emphasis from dogma. The two dogmas of God and the future life *are* still essential to Christianity, and it is precisely these dogmas which conflict with the monistic conception of the universe. The few advanced thinkers we have encountered represent, on the whole, only a small cultured minority. The great bulk of the faithful cling to the old ideas in the old form. And it is because this mass of conventional belief still exists that preachers find it possible and advisable to bespatter the reputations of fearless and sincere speculators, who seek to spread their views amongst the people.

Such a thinker as Haeckel, who has found his faith obstructed throughout life in the supposed interest of Christianity, naturally turns to consider that great religion when the solid frame of his monistic system is compacted. He finds four dogmas chiefly responsible for that strong attachment to Christianity, which seems to him to prolong the life of the errors he has criticised and the diversion of men's interest to another world. These are, briefly—a belief in the supernatural character of the Bible; a belief in the divinity, or the unique character, of Christ; a belief that there is something preterhuman about the historical progress and moral power of the Christian religion; and a belief in the infallibility of the Pope. He therefore seeks to discredit those beliefs, in order to prepare the way for an impartial consideration of the new conception of life which he regards as true and valuable. At once, of course, he is credited with some mysterious "hatred" of Christianity; as if his critics were somehow unable to understand a pure love of truth or regard for its moral and social stimulus. However, it is on this chapter of his work that critics have fastened most eagerly and most ardently.

Now, one cannot but protest in passing against the foolishness of such a procedure. All the world knows that Professor Haeckel is not an expert in ecclesiastical history. If he felt himself constrained to warn his readers that he had no expert acquaintance with physics, lest he might innocently induce the uninformed to attach undue weight to his judgment in that department, he might in return expect from them a reasonable sense of the proportion of his book. His authority lies chiefly in zoology. We saw that he built some of the most important parts of his system on the facts of zoology, or biology, and it is to these that the honest critic will mainly address himself. We saw how few of the critics did so. But the book was intended, as he says, to stand in some measure for the complete system of his thought, which he feared he could now never give to the world. It, therefore, contained an expression of his opinion on a multitude of topics which it is not essential for a Monist, as such, to pass judgment on. In this he naturally challenges the criticism of his opinions, and must meet it. But he had a right to expect that his book and his system of thought should be judged essentially by their essential positions; he had a right to expect that no one who would be likely to read ten pages of such a book would be so unintelligent as to extend his zoological authority into the domain of ecclesiastical history.

Further, no one who takes the trouble to understand Haeckel's system of thought would expect him to devote very considerable time to an examination of the dogmas I have enumerated. If his previous conclusions are true, these dogmas *must* be false. That is a logical and proper attitude. The man who has spent a life in deciphering the message

of the cosmos, and has been compelled to interpret it in a monistic sense, and reject entirely the dogmas of God and immortality, has reached a conclusion which he may apply to Christianity with as strict and full a right as the historian who has devoted his life to the direct study of it. Theistic writers are too apt to forget this. When a man has reached a conviction that God is a myth, he is neither logically nor morally expected to ask himself seriously whether Christ or Christianity is divine. And it is perfectly obvious to any one who reads this seventeenth chapter of the *Riddle* that this has been Haeckel's attitude. He merely skims the surface of a vast historical subject. He abandons the rigid method of the earlier part, with its accumulations of evidence. He hesitates to "devote a special chapter to the subject," and refers to other works. He then decides to "cast a critical glance" at it, protesting that it is only the hostility of the Churches which provokes him to do so. He is mindful of "the high ethical value" of pure Christianity and "its ennobling influence on the history of civilisation." But it still clings to beliefs which Haeckel (and large numbers of its own theologians) believe to have no more than a legendary foundation, and which nevertheless give it an incalculable influence on the minds of millions. Haeckel, therefore, gathers from a group of German works or translations (all of which are indicated in the German edition) points of criticism in regard to these dogmas, and briefly, with a light satire that evinces the absence of prolonged research in this department, fires them at the popular beliefs.

These considerations, which will readily occur to the impartial student, are prompted by the tactics which have been largely employed in the criticism of the *Riddle*. What value there is in the attack on its main position we have already seen. The epithets that have been showered on the distinguished scientist recoil on their authors where there is question of the essential and characteristic portion of his work. But it has been sought to bring the full weight of expert historical scholarship to bear on this episodic chapter on Christianity, and to make any defect discovered in it the occasion of a bitter and violent attack on Haeckel's general authority. The trained thinker sweeps aside such tactics as an impertinence. But the untrained and uninformed millions of the Churches are assured that Haeckel's authority has been discredited. They are taught that his rejection of Christian beliefs is traceable to a "childish credulity" (Dr. Horton) and is supported by "mendacities" (Mr. Ballard). However, let us examine the allegations on which the grossest diatribes against Haeckel have been supported.

The Achilles of the critics in this department is Dr. Loofs, professor of ecclesiastical history at the University of Halle, and from his *Anti-Haeckel* we gather the most formidable censures.[1] This work I have already qualified as one of the coarsest and most painful publications that have issued from a modern university. The story of its writing runs thus. Dr. Loofs tells us —St. Bernard has the same artistic exordium to his attack on Abélard— that he was dragged into the arena by friends and colleagues in Germany. He read the seventeenth chapter of the *Riddle*, and at once wrote an "open letter" to Dr. Haeckel on the errors it contains. This "open letter" first saw the light in the pages of an Evangelical weekly, *Die Christliche Welt*, which circulates amongst some 5,000 pious readers in Germany, and is hardly likely to penetrate into a university. Its tone was bitter and scurrilous. However, it was copied by other periodicals, and Haeckel wrote a brief reply in a scientific and serious review, the editor of the review, Dr. E. Bischoff, support-

[1] An English translation is promised, but has not appeared at the time of writing. It will, no doubt, temper the extreme coarseness and ugliness of the German original.

ing Haeckel with his expert knowledge and with a very plain but dignified comment on Loofs's procedure. At this Dr. Loofs seems to have lost all sense of either humour or dignity, and included these documents with his reply in the *brochure* we are about to examine. Its pages sparkle with incandescent phrases, which are, moreover, usually italicised. "Incredible ignorance," "crass stupidity," "pure folly," etc., are amongst the milder of these phrases. When, towards the close, he looks back on his virulent italics (or that larger type that serves for italics in German), he says deliberately: "It is not the 'point of view,' not the 'system,' of Professor Haeckel, but his *scientific honour*, that I have attacked; and I have done it so unmistakably that any court will convict me of libelling my colleague of Jena, if I cannot support my charges." In a word, he tells us (3rd edit., p. 52) that the Press has ignored his precious diatribe, and that a libel action (though he declines to "provoke" it) will bring his grievance before the public. Such is the famous rejoinder to Haeckel which our ecclesiastical journals have praised so highly.

After all this the reader will expect to find that Haeckel has been convicted of one of the most remarkable series of controversial frauds and literary delinquencies that a university professor—to say nothing of a man with four gold medals and seventy honorary diplomas—ever stooped to. The reality would be amusing if it were not for the vulgarity and coarseness in which it is enveloped. Leaving aside the pedantic discussion of minor points (the date of the Council of Nicæa, the authorship of the *Synodicon*, and so on), and granting that Dr. Loofs abundantly proves that Haeckel is not an expert in ecclesiastical history (if there be any who did not know it), we find that the two chief points are the criticism of Haeckel's observations on the formation of the canon and on the birth of Christ.

Haeckel, it will be remembered, states that the canonical gospels were selected from the apocryphal by a miraculous leap on to the altar at the Council of Nicæa. At this the indignation of our professor of church-history flashes forth. Mr. J. Brierley alludes to this, saying: "He gives the story as though it were the accepted Christian account of the admission of the four gospels to the canon. It is difficult to characterise this statement." Well, it is fortunate that some rationalistic Dr. Loofs does not have to characterise *this* statement. Haeckel does exactly the reverse of this. He gives the "leap" story as a correction of the "accepted Christian account." "We now know," he says, in introducing his version. Further, he gives the statement candidly on the authority of the *Synodicon*; though he should have said this was only *edited* by Pappus. His own honesty in the matter is perfectly transparent; if his acquaintance with ecclesiastical history is very far from complete. The story in the *Synodicon* is not to be taken seriously. The canon of the gospels was substantially settled long before the Council of Nicæa. It is true that Dr. Loofs is himself accused of error by Dr. Bischoff for stating that the Nicene Council did not discuss the canon, but we will keep to the main issue. The story taken from the *Synodicon* is not worthy of consideration as an account of the forming of the canon.

The reader will remember Haeckel's pointed warning in his preface that, not only are his conclusions on all matters "subjective and only partly correct," but his book contains "studies of unequal value," and his knowledge of some branches of science is "defective." In the face of those repeated expressions it is ludicrous to suppose that Haeckel wished to employ his great authority as a man of science to enforce opinions in ecclesiastical history. Here is, on the face of it, a department of thought where no one will suspect him to have spent much of his valuable time, and the dis-

covery of defects in this chapter was almost a matter of course. He has acknowledged those defects, and has inserted in the cheap German edition of his work a notification that the authority he followed on this and the following question was unsound. That authority was an English writer, who had had a theological training, and whose work had been translated into German. Haeckel had been wholly misinformed as to his standing in this country, and thus had been betrayed into a reliance on what he understood to be his expert knowledge. In the case of a writer who claimed infallibility, or at least a uniform weight, for the whole of his book, such a defect would be more or less serious. Whether it was in point of fact one-tenth as serious as some of the procedure of his critics which we have reviewed, whether it is a matter for violent discussion at all, and not one that might have been pointed out by a colleague without loss of dignity—I leave it to the reader to say. The section in which the passage occurs shows a fair average acquaintance with its subject, but it is clear from the authorities explicitly mentioned in it (Strauss, Feuerbach, Baur, and Renan) that it was written, or prepared, years ago. Any modern expert would find it defective. Whether this defect is a fitting ground for Dr. Loofs's structure of rhetoric and scholarship may be called into question. But whether it is either sensible or honourable to seek to discredit Haeckel's earlier positions in science, which we have reviewed, by a microscopic examination of such a section as this, cannot long remain undecided.

Before we pass to a consideration of the second chief charge, there is one more point that it is highly expedient to make clear. The average inexpert reader, about whom our ecclesiastical writers have suddenly grown so concerned, will be apt to suppose that this deadly attack by the spirited theologian of Halle is prompted by a devotion to the current belief in the unique value of the Gospels. He will learn with surprise that Dr. Loofs by no means shares the conventional reverence for the New Testament. The synoptic Gospels were written, he thinks, between the years 65 and 100, and the Gospel of "St. John" before 125. That is the general opinion of biblical scholars to-day; but it is by no means the general opinion of the readers of *Die Christliche Welt*, or of religious people in this country. What is more important, Dr. Loofs, as we shall presently see, rejects as worthless, if not dishonest, interpolations some of the most treasured and familiar passages of the New Testament. Let us remember what *is* really at stake in these controversies.

To come, then, to the cardinal offence of Haeckel's book—we will take a few detailed criticisms later—we find it in the statement that Jesus was the son of a Greek officer of the name of Pandera. Now let us approach the subject with some sense of proportion. For Haeckel it is (legitimately) a foregone conclusion that Jesus was a human being, born in a normal manner. The conclusions he has already so laboriously reached compel him to assume this. If there is no God, Jesus was a man—a "noble prophet and enthusiast, so full of the love of humanity," Haeckel generously describes him. This is a standpoint which Haeckel is by no means alone in taking to-day. The vast majority of the cultured writers of every civilised country share it with him. It is very largely held within the ranks of the Christian clergy themselves. Mr. Rhondda Williams preaches it openly. The position of our own Broad Church theologians is known. Even Dr. Loofs—remember well—holds as frankly as Haeckel does the natural human parentage of Jesus, and has formulated his opinion, as the opinion of the average cultured theologian, in a German theological encyclopædia. He angrily resents the imputation that he believes in the virgin-birth, and says no historian of

dogma can entertain it. He affirms that the birth-story in Matthew and Luke is a late interpolation in the Gospel, and is quite discredited.

What then *is* the great difference between the two? It is that Loofs awards the paternity of Christ to Joseph, and Haeckel assigns it to the Greek officer of a Roman legion. Our average Christian neighbour will probably feel that in substance it is a case of the devil and the deep sea.

Further, it is easy to see in what frame of mind a scientist like Haeckel would approach such a matter. The birth of a Saviour-God from a virgin is a legend that we find in all kinds of religions anterior to Christianity. We know that in all these cases the prophet, or god—supposing his historical reality—was awarded this distinction by later admirers to enhance the repute of his divinity. When, therefore, Haeckel is commenting on the dogma of the Immaculate Conception,[1] he turns aside for a moment to discuss the question of paternity. Not attaching an overwhelming importance to the question, Who was Christ's father? he does not make a profound inquiry into it. But in one of his authorities—the English writer whom I have mentioned—he finds the curious statement that the father was a Greek officer, and it seems to harmonise with the other statements. He finds that the Gospels emphatically exclude the notion that Mary was at that time married to Joseph, or that Joseph was the father. He finds, too, that as a matter of history these miraculously born children were generally illegitimate. In fact, the introduction of a Greek strain would help not a little to interpret the scriptural figure of Christ, if it is taken to be historical. It has long been an argument for the divinity of Christ that the figure depicted in the New Testament is so very un-Hebraic in many of its features. We who know the composition of the Gospels understand this Greek element. But the supposition that Christ had a Greek father is not a little attractive in the circumstances. When, therefore, Haeckel learns from his authority, or supposed authority, that in one of the apocryphal gospels (the Gospel of Nicodemus) Jesus was said to be the illegitimate son of a Greek officer, and that this is confirmed by the *Sepher Toldoth Jeschua*, he at once embraces it as the most plausible explanation of the "high and noble personality" of the Galilean. These apocryphal Gospels are, he tells the reader, no less and no more reliable in themselves than the canonical Gospels, but this version of the birth seems to accord best with the general situation.

Now this is a perfectly honest procedure for a man who makes no pretension to expert knowledge or research. Haeckel has again been misled by his authority, it is true. The sentence he quotes from "an apocryphal gospel" is not found in any of those books in that form. The Gospel of Nicodemus merely states that the Jews declared Christ to be illegitimate. The *Sepher Toldoth Jeschua*, which gives the story, is an early mediæval Jewish work of no authority. The story can, indeed, be traced back well into the second century (to about 130 A.D.), since Origen gives it as being told to his opponent Celsus by the Jews, in his *Contra Celsum* (I, 32); but this was unknown at the time to Haeckel and his authority. Further, it is misleading to say "the official theologian" burks the story. It is perfectly true that the *Sepher Toldoth Jeschua* is little commented on, but it is a worthless document; and Strauss, the author of the *Life of Jesus*, had contemptuously rejected the story. These are undoubted errors on Haeckel's part. But, after all, the

[1] Which he misunderstands. The dogma of the Immaculate Conception does not refer to the conception of Christ by Mary, but to the conception of Mary by her mother. Dr. Horton is astonished at Haeckel's ignorance. For my part I am astonished at Dr. Horton's knowledge. The version Haeckel follows is quite the ordinary non-Catholic version of the dogma. You will find it even in Balzac (*La messe de l'athée*). Nay, even Mr. Ballard, B.D., thinks it is correct (*Miracles of Unbelief*, p. 348).

radical error is that he took a superficial and unreliable author as his authority. To have been misinformed as to the weight and qualifications of a foreign writer on a subject completely outside his own territory, and to have neglected to verify his information, is the full extent of Haeckel's delinquency. Dr. Horton, who gives Vogt and Büchner as shining lights in the spiritualist firmament, pompously tells us this was "childish credulity." Mr. Ballard, who deals in such a remarkable fashion with Haeckel's observations on the pyknotic theory and abiogenesis and determinism, says he is "ashamed to put such mendacities into print," and that if Haeckel is not ashamed of himself he has not developed "an elementary degree of morality." Dr. Loofs calmly pours out such a stream of invective that he thinks it well to remind Haeckel of the text and section of the German law which covers the case! He is afraid, he says, that Haeckel will not be stung into dragging the matter into court, and so he continues to the end to dredge up the strong sediment of the German dictionary.

A more ludicrous situation it would be difficult to conceive. Haeckel frankly states that in his opinion this is a subject on which none of the evidence is worth much. But he finds one legend more plausible than that given in the canonical gospels, and he points out that it *seems to be* the most plausible. There is not the slightest deception, as he openly relies on the intrinsic plausibility of the story, and openly states the immediate and the ultimate sources from which he takes it. No doubt he should have examined more closely into the subject, and should have looked into more weighty and more recent literature. He would then have found that the passages which deny Joseph's paternity "belong to the least credible of New Testament traditions," as Dr. Loofs says.[1] But that his opponents should attack him with this virulence and viciousness on that account is one of the most disgraceful episodes of this dreary controversy.

The other defects which Dr. Loofs discovers with his microscopic eye in this chapter of the *Riddle* are mostly pedantic rectifications of minor statements, or corrections with which only an expert would concern himself, and as to which opinions sometimes differ. Many of them are quite paralleled by Dr. Bischoff's examination of Loofs's own statements. The year of the Council of Nicæa and the number of bishops present are incorrect; the number of apocryphal gospels and of the genuine Pauline epistles is not according to the latest vagary of the critics; the statistics of religion are not up to date; the Immaculate Conception and Immaculate Oath are improperly described. These are the other points of the indictment. The reader may judge for himself whether there is anything more than a lack of expert knowledge in these things; and whether Haeckel ever claimed, and did not rather disclaim from the outset, such expert knowledge.

But we now turn to another aspect of the matter. Haeckel, I said, set out to discredit four dogmas which he found hindering the progress of scientific knowledge amongst the people at large. The serious reader, impatient of all this dust-throwing and mud-throwing, will ask how far the substance of Haeckel's attack on these dogmas survives this scrutiny, and how far it is supported by sound historical research. The dogma of the infallibility of the Pope does not appeal to the sympathies of these Protestant critics, so that Haeckel's attack on the papacy is allowed to stand. Let us consider his position with regard to the other points—the uniqueness of the Bible, of Christ, and of the history of Christianity. Whether Haeckel is infallible or not is hardly a subject for prolonged discussion, provided his "scientific honour" and "scientific conscience" are not involved in the

[1] *American Journal of Theology*, July, 1899.

manner that Dr. Loofs would have the readers of *Die Christliche Welt* to believe. The serious question is: Can we sustain his attack on these dogmas, apart from the incidental errors into which his unfortunate reliance on "Saladin" has betrayed him? This is a study in Church History, in the full sense in which that science is understood to-day.[1] We shall see that the substance of Haeckel's position is completely supported by our present knowledge of the subject.

In the first place, that implicit reliance on the statements found in the Bible, which Haeckel set out to impugn, is now wholly discredited. We need not consider the Old Testament, and Haeckel does not discuss it. The cosmological speculations of Genesis are now known to have been borrowed from earlier religions: the historical books are so full of error that we can only trust them when we have independent verification; whole books (Daniel, Esther, Tobit, etc.) are given up as wholly unhistorical. This can be learned from the works of Christian scholars to-day. The Old Testament remains a work of surpassing interest, containing some fine literature and some of the highest moral teaching of the ancient world. But it no longer obstructs the path of the scientist or the historian. As to the New Testament, the work of reconstruction is not equally advanced. Writers like Archdeacon Wilson confuse the issue by taking "verbal inspiration" to be the butt of the rationalist attack. No doubt one will still find many simple believers in verbal inspiration, but that is not the serious difficulty. The opinion that the rationalist seeks to discredit—the opinion of the majority of Christians to-day (solemnly propounded to the world only a few years ago by the official head of the Church of Rome)—is the belief that the Bible contains no error. Once the infallibility of the Bible is abandoned, it ceases to be a barrier to progress. The infallibility of the Old Testament is not now held by any Christian scholar; and the infallibility of the New Testament is rapidly being expelled from the cultured Christian mind. We have seen how Dr. Loofs himself rejects the account of the virgin-birth (Matt. i., Luke ii.) which had worn itself into the very heart of Christianity. "No well-informed, and at the same time honest and conscientious theologian, can deny that he who asserts these things as indisputable facts affirms what is open to grave doubts," he says, significantly enough, in his article in the *American Journal of Theology*. In his article ("Christologie Kirchenlehre") in the *Real-Encyclopädie für Protestantische Theologie* he talks freely of "layers of biblical tradition" and their relative trustworthiness. This statement, which has been taken throughout the Christian era to be the most characteristic and one of the most important statements of the New Testament, is now relegated to "one of the latest and least reliable" of these "layers." The article on the Gospels in the *Encyclopædia Biblica*, which reflects the condition of cultured biblical thought in England, is written entirely in the same spirit; the author finds only nine texts in the Gospels which are "entirely credible," and without which "it would be impossible to prove to a sceptic that any historical value whatever was to be assigned to the Gospels."

The inexpert reader is often misled by statements to the effect that the critics are returning on their traces, and are denying the late dates assigned by the Tübingen school to the Gospels and the fewness of the genuine epistles of St. Paul. The second point is not important for our purpose, but the first statement is

[1] As a fact, the real secret of Dr. Loofs's bitterness and animosity seems to be that Haeckel has laid a strong charge against Church History. Apart from one historian, whom he mentions by name, there was no reason for thinking he included advanced writers like Harnack and Loofs. But that his charge against conventional Church History was solidly grounded is well known to every student of history, and will presently be fairly established.

gravely misleading. When an ecclesiastical journal or a tactical apologist reproduces Harnack's saying that recent criticism is vindicating "the essential truth of tradition" about the Gospels, one can only regret that one is incompetent to borrow some of the phrases of Dr. Loofs. The simple believer is encouraged to think that the miraculous life of Jesus is being fully rehabilitated. The composition of the Gospels is being put back to the period 65–125: that is to say, 65–70 for Mark, 70–75 for Matthew, 78–93 for Luke, and 80–120 for John. It is not thought proper to explain that the critics by no means refer to the Gospels as we have them to-day, and that these Gospels consist of earlier and later "layers"—in plain English, interpolations. It is not considered necessary to explain that the return to the Gospels only means, in the words of Loofs, "a return to the *sayings* of Jesus in the synoptic gospels," and that the miraculous legends may be sorted out as unprovable and incredible. Well may the *Christian World* complain of "the lack of honesty" in theological literature! The truth is that the historical value of the New Testament is shattered, and Christian scholars are, as in the case of the Old Testament, retreating upon its ethical value. Thus the putting back of the composition of the synoptic Gospels into the first century does not save that popular reliance on their legends which Haeckel solely regarded.

This brings us to our second point, the consideration of the person of Christ. In this, as a matter of fact, Haeckel takes up an exceedingly moderate position, and falls far short of the advanced position of many of the ablest recent Rationalist writers. He assumes not only the historical character of Christ, but also that we know enough about him to speak of "his high and noble personality" and to describe him as "a noble prophet and enthusiast." He denies the divinity of Christ, the miraculous powers that are assigned to him in the Gospels, and the originality of some of the chief ethical sayings attributed to him. This is not merely a position that will readily be endorsed by numbers of Christian theologians, but it is one that many theologians, to say nothing of non-Christian writers, will regard as granting too much to the religious tradition. How widely the divinity of Christ is rejected to-day few can be ignorant. The vague and fluid phrases in which even the belief in it is expressed very commonly now mislead only the inexpert. The older Rationalistic attitude as to Jesus—that we might omit the supernatural portions of the Gospel narrative and take the rest as historical—is giving way to a more scientific procedure, and the figure of Christ is dissolving into a hundred elements. Comparative religion traces numbers of the Gospel legends, such as the virgin-birth, if not all the features of the birth-story, to pre-Christian religions. The death and burial, many incidents of the life, and very much of the teaching, are not more difficult to trace. Whilst Christian scholars are separating the Gospel-story into "layers of tradition" (thus explaining the obvious contradictions), the study of the Greek, Egyptian, Mithraist, and other religions, which prevailed at the time and in the place where the Gospels were written, is assigning their proper sources to the "later layers."[1] The virgin-birth, which has been so prominently brought before the mind of English readers through the famous denial on the part of a dignitary of the Church of England, is only an illustration of the process of dissolution that is going on. When that process is complete we shall see how little will be left of the figure of the Crucified that has been graven on the heart of Europe for nearly 1500 years. Most assuredly Haeckel's position is a modest one. And

[1] Read the able and learned efforts to trace many of the gospel-elements in Mr. J. M. Robertson's *Pagan Christs* and *Christianity and Mythology*. For the analysis of the Gospels read especially Dr. Schmiedel's article in the *Encyclopedia Biblica*.

to conceal the strength of his position (as opposed to the conventional position) by the dust of a heated conflict as to whether Christ's father was Joseph the carpenter or Pantheras the Greek is only another specimen of "the lack of honesty in apologetic literature."

The third point to which Haeckel addresses himself is the belief that there has been anything unique about the history or power of the Christian religion. Here not only is Haeckel's position very moderately expressed, but the belief he attacks is dissolving more rapidly than the preceding beliefs. The term "unique" is—people so often forget—a relative or comparative term; yet nine-tenths of the ordinarily educated Christians who talk of the uniqueness of the Bible have never read a line of the Babylonian, Persian, Egyptian, Hindoo, or Chinese religious literatures; nine-tenths of those who talk of the unique character of Christ are totally ignorant of the work and (traditional) character of Zoroaster, Buddha, Lao-Tse, Kung-Tse, Apollonius, or the Bab; and nine-tenths of those who think the history of Christianity is "unique" have never studied, even in the most general way, the growth and work of Buddhism, or Confucianism, or Parseeism, or Manicheeism, or Mohammedanism, or Babiism. They have trusted their ecclesiastical historians—not men like Loofs and Harnack, but the "popular" writers and the apologetic writers of the Churches. Through this literature most of us have waded at one time or other; we can appreciate the justice of the heaviest censure that can be passed on it. It is one of the most questionable implements in the employment of the modern Churches. Complaint is frequently heard that rationalist writers are ever seeking to belittle and besmirch a religion which, with all its defects, has had, in Haeckel's words, "an ennobling influence on the history of civilisation" (p. 117). The reason is found in the gross mis-statement and perversion of the moral and religious life in Europe during the last 1500 years which the ecclesiastical historians have been guilty of.

I will take in illustration one of the most characteristic and interesting periods of this history of which I chance to have expert knowledge—the fourth century. Not many years ago I taught in a seminary, and preached from a Catholic pulpit, the conventional theory of a spiritual conquest of the Roman world by Christianity—of "Rome, oppressed by the weight of its vices, tottering to embrace the foot of the crucifix." That is the historical theory you will hear from almost every pulpit in this land to-day, and will find, not merely in Christian Evidence and S.P.C.K. and R.T.S. Tracts, but in Sheppard and Milman and Villemain and Döllinger and other standard authorities. It is a ridiculously false picture. Schultze has shown [1] that in some of the most important provinces of the Empire not more than two and a half per cent. were Christian at the beginning of the fourth century. The old religion had almost lost all serious influence, and a number of Oriental religions were pervading the Empire with an ascetic and spiritual gospel. Of these religions Christianity was one—not the most ethical or spiritual or most successful. When the persecutions ceased, and the Christians came out into the light of day, their spiritual poverty was—with few exceptions—a notable feature. Until 323 they proceeded quietly with their proselytic work, like the Mithraists and the Manicheans, whom they closely resembled, when the conversion of Constantine to Christianity suddenly gave them an immense advantage. The emperor's "conversion" is not claimed to have been important either as an intellectual or a spiritual phenomenon, but it was supremely important in the political sense. Courtly senators followed his example. It became, as Symmachus, one of the last of the great pagans, says, "a new form of ambition to desert the altars" of the gods. Successive Christian

[1] *Geschichte des Untergangs des Heidenthums.*

emperors sat on the Western throne, but preserved a political neutrality, so that Christianity advanced slowly. The short reign of Julian showed how far Christianity was from a triumph, and his successors, though Christian, still declined to interfere politically in the rivalry of religions.

By the year 380 the overwhelming majority of the people and "nearly the whole of the nobility" (St. Augustine says) were still Pagan; and the letters of St. Jerome show that the Christians were less spiritual than ever. But in 382 the "triumph of Christianity" began; within twenty years it became the religion of the Empire. How? From the accession of Gratian (aged sixteen) and Valentinian II. (aged four) there was a succession of youthful, weak, and religious emperors in the West. The court was at Milan; its spiritual director was St. Ambrose, one of the finest, strongest, and most ambitious (for the Church) of the fathers. He used his influence, threatened the boy-emperor with excommunication, and soon decree after decree went out in favour of Christianity. The pagan revenues were confiscated: then the pagan temples were destroyed or sealed up: finally any who dared to cultivate any other than the Christian religion were fined, imprisoned, and threatened with death. At the same time the Christian Churches adopted, or had already adopted, all the attractions of the temples. They had gorgeous vestments and ceremonies and processions, aspersion with water, incense, banquets and dancing in the Church on feast-days (generally ending in drunken revelry), and all that the Roman cared for in "religion." The pagan merely walked over to the Christian temple, when he found his own barred by soldiers or razed to the ground, and took with him his music and flowers and incense and wine and statues. There was no great moral reform, no great spiritual conversion, except in a few distinguished cases like that of St. Augustine.[1]

This gross misrepresentation of historical truth by ecclesiastical writers is the sole reason for the Rationalist's playing "the devil's advocate." Almost the whole period of Christian history has been treated with similar untruthfulness. The good has been greatly exaggerated: the evil suppressed or denied. The belief in the uniqueness of the growth of Christianity and of its moral and civilising influence rests on a mass of untruth and of calumny of other religions and sects. Christianity and its sacred books take their place in the great world-process. We see them growing naturally out of the older religions and literatures, and linking us with thoughts of other ages. When theological literature has ceased to offend us and to mislead the people with its "lack of honesty," we will study them with impartial interest, and seek to establish their influence for good as well as their share in the degradation of Europe from the first century to the twelfth. Until then the work of the Rationalist historian is bound to seem destructive and one-sided.

[1] Fuller details may be found in the author's *St. Augustine and His Age:* or in Boissier's *Fin du Paganisme*, Beugnot's *Histoire de la Destruction du Paganisme*, or Schultze's *Geschichte des Untergangs des Heidenthums.*

CHAPTER XI

THE ETHIC AND RELIGION OF MONISM

MR. H. G. WELLS, the accredited prophet of these latter days, predicts in his well-known *Anticipations* that by the end of the present century Christianity will have been wholly abandoned by people of culture. There will be, he thinks, "a steady decay in the various Protestant congregations," whilst Catholicism will increase for a time, but only amongst "the functionless wealthy, the half-educated, independent women of the middle class, and the people of the Abyss." Another recent writer, Sir Henry Thompson, says in his essay on *The Unknown God*: "The religion of Nature must eventually become the faith of the future; its reception is a question for each man's personal convictions. It is one in which a priestly hierarchy has no place, nor are there any specified formularies of worship. For 'Religion [in the words of Huxley] ought to mean simply reverence and love for the Ethical ideal, and the desire to realise that ideal in life.'" Recently, too, Mr. J. Brierley wrote one of his widely-read articles in the *Christian World* on the theme that there is impending "a more radical and *more effective* attack on Christianity" than any that have preceded. Mr. Rhondda Williams says that "already it is the fact that the cultured laity on the one hand, and the great bulk of the democracy on the other, are outside the Churches." It is true that Mr. Ballard wrote in the *British Weekly*, in July of this year, that Christianity "is at all events larger in quantity and better in quality than ever before, and has a brighter promise than in any previous period of its history." But within two months we find him expressing himself as follows: "The outlook is a serious one; but I am not a pessimist, although too many of my colleagues regard me as such. I am only sensitive to the danger of the day. What they call pessimism I call open-eyed honesty. We are entering on a very grave and probably prolonged struggle, as Dr. Flint has recently stated. The modern atmosphere is in general tending away from rather than towards all that is distinctive of Christianity."[1]

Many things happened during the course of the year 1902 to elicit or to confirm these vaticinations. Haeckel's *Riddle of the Universe* was circulating to the extent of some eighty thousand copies in this country alone. Ecclesiastics affected to believe that it was only ignorant and thoughtless workers and clerks who were deluded by its show of learning, but they must have known that it was being eagerly read by tens of thousands of thoughtful artisans and middle-class readers.[2] Letters began to trickle into the religious Press, telling of increasing secessions and expressing extreme alarm. Within twelve months the Rationalist Press Association, labouring under the usual disadvantages of an heretical publisher, put into circulation nearly half a million of its publications;

[1] See interview by Mr. Raymond Blathwayt in *Great Thoughts*.

[2] So much pity is expressed in this connection for the poor artisan that I must make this observation. I have had intimate knowledge of the clergy—Roman Catholic clergy, who, as a rule, have had more definite philosophical instruction than their Protestant colleagues—and have lately, in the course of lecturing and wandering, made a fair acquaintance with the working and lower middle-class readers, who so largely purchase sixpenny editions. I do not hesitate to say that there are tens of thousands of the latter in England who can read Haeckel more intelligently than the majority of the Catholic clergy.

and almost every journal in England was disturbing the peace of the faithful with a reminder that there *was* a riddle of the universe. A Socialist journal, the *Clarion*, made a drastic and sustained attack on Christianity, in spite of threats and jeers, and immediately found itself in touch with the predominant sentiment of its readers. Other working-class organs found it equally safe to open fire on the Churches. Two independent and rigorous inquiries were conducted into the religious condition of London, where the Churches display incalculable wealth. Both inquiries—that conducted by Mr. C. Booth and that conducted by Mr. Mudie-Smith for the *Daily News*—proved that the Christian Churches in London do not attach to themselves more than a quarter of the population, and that the great majority of their adherents are women. A census taken in Liverpool was equally depressing; and observations made in several small provincial towns showed that the condition was very general in the country. At the Trade Union Congress at Leicester the representatives of several million workers declared for the exclusion of religious instruction from the schools. A superficial inquiry at New York discovered the same condition in America, and the latest Australian census also showed a decay of the Churches, especially the Catholic Church and the Salvation Army. M. Guyau discovered that in Paris not one in sixteen of the population attended church, and Protestant ministers have reported that scarcely 5,000,000 of the population of France remain under the obedience of the Roman Church. The Belgian elections show that half the population of that "Catholic" country has definitely ranged itself against the Church. The success of the Social-Democrats in Germany, and the reports from Spain and Italy, point to the same general defection of the people from Church influence.[1]

[1] One of the points in which Dr. Loofs joins issue with Haeckel is in relation to religious statistics. Haeckel had given (from another writer) the number of Christians as 410,000,000. Dr. Loofs quotes two recent authorities who give the figures as 535,000,000 and 556,000,000, respectively. This is a fair illustration of the "victories" of our apologists. Everyone knows that these figures are obtained by lumping together the populations of what are called "Christian countries." So France and England are each credited with about 40,000,000 Christians instead of 10,000,000. Belgium and Italy and other countries are similarly treated. The figures are totally worthless.

With the various sources of consolation which the clergy point out to each other we are not concerned. The chief of these seems to be hope; and a complete ignorance of the grounds on which it rests prevents me from discussing it. We know that the Churches have enormous wealth; one secondary denomination having recently collected a sum of a million guineas, and another having erected a cathedral at a cost of a quarter of a million. We know that no odium attaches to the *defence* of Christianity, if a scientist or historian be disposed to defend it. We know that no intrigue or menace is directed against the publication or circulation of Christian literature. We know that the wealthier journals of this country and the general cultured sentiment is averse to attacking even when it does not believe. We know that the clergy have made enormous concessions to the secular spirit of the age, until in places their definite religious ministration can only be timidly and apologetically slipped in between a cornet solo and a phonographic entertainment. Yet "the outlook is serious," and "the cultured laity and the great bulk of the democracy are outside the Churches." Mr. Ballard has made merry over the fact that Haeckel opens his work in a despondent strain, and yet his translator prefaces this with "a pæan of triumph." He forgets that there is an interval of several years (not two *months*, as in his own case) between the two passages. The twentieth century opened with—most Rationalists considered—a brighter prospect for the Churches. Already this

has wholly faded, and it seems impossible for the Churches ever to regain a foot of the lost territory.[1]

This is not a "pæan of triumph," but a statement of fact. In the days when a profession of unbelief involved social ostracism and malignant calumny, when men were thrown into prison with the dregs of society for selling critical literature or uttering critical sentiments, when nearly every advance of science was opposed by ignorant clergymen, when women were bade to see their husbands and sons in Hell for refusing to frequent the church, and the mind of England was enslaved to dogmas that all abhor to-day, the attack on Christianity was necessarily predominantly negative and destructive. Growth was impossible until the iron bonds were broken. To-day Rationalism, still rightly militant and critical, has a conspicuous constructive side. It has a sociological outlook and an idealist gospel. After all, the life of Europe has rested on doctrinal foundations so long, and has grown so accustomed to the stimulus of religious thought, that some idea must be substituted for the sources of inspiration that are rapidly exhausting. Haeckel turns, therefore, at the close of his cosmic speculations and his historical glance at the Christian Church to consider this question of the successor of Christianity. Years ago he offered Monism as "a connecting link between science and religion"; as a system that could unite harmoniously the finest ethical truths of the Christian religion with the unshakable truths of modern science. Even the believer in Christianity must at times contemplate with misgiving the practice of grounding the moral life on beliefs which are to-day disputed and attacked in every workshop in the land. The child who has been trained to honesty and sobriety on the ground of supernatural reward or punishment, or on the mere ground of giving offence to an injured deity, must be of a singularly robust character to withstand entirely the sneers at Hell and Heaven and the open disbelief in God that will presently assail his ears. If it be desirable to have a humane, temperate, and honourable community, it behoves every thoughtful man to cast about for some other ground for the commendation of these moral qualities than an enfeebled and disputed dogma. Increasing stress is, therefore, laid on the ethical and religious aspect of Monism.

One result of this is that, although the Churches of our day profess a tolerance which would have outraged the feelings of their earlier leaders, their apologists have by no means ceased to gird at the alleged disastrous consequences of materialism and agnosticism. Mr. Ballard, who is supposed to have studied "unbelief" and "unbelievers," introduces his study (*Miracles of Unbelief*) with this amiable quotation:

> "Hold thou the good: define it well:
> For fear divine philosophy
> Should push beyond her mark and be
> Procuress to the Lords of Hell."

Mr. Rhondda Williams says "ideal has no place in Haeckel's philosophy"; and that on his principles "over the crimes of a Cæsar Borgia you must write a great 'Can't help it.' . . . The sweater who grinds the faces of the poor can't help it." Dr. Horton says that "men who have no belief in God and immortality sink to the level of the brutes," and "come down to the level of the stocks and the stones"; that their "soul is shrunk, the mind is warped, and the very body must carry its marks of degra

[1] Mr. Campbell makes a rhetorical point by challenging a comparison between the census of church-goers and a census of "all the professedly atheistic assemblies in London, all the Hyde Park atheistic platforms, and the people who are listening to atheistic propaganda." Such a quibble is unworthy of a serious speaker. The limitation to "professedly atheistic" gatherings makes the comparison ludicrous and unmeaning. Let me in turn issue a challenge. Let the figures of the circulation of the sixpenny Christian publications be honestly compared with an equal number, in an equal time, of the Rationalist sixpenny works. Rationalism, Mr. Campbell knows quite well, is almost entirely unorganised.

dation." Mr. R. J. Campbell says that if the soul is not immortal, then the right philosophy is to "eat and drink and be merry"; that the real obstacles to Christianity are the thirst for money, sensual pleasure and entertainment; and that atheism is "the gospel of destruction, disease, and death."[1] This sentiment is repeated weekly from scores of pulpits all over the country; it is a commonplace of ecclesiastical literature and of a certain type of fiction.

Such tactics are malignant and dishonourable. I remember reading an article in the *Daily News* some months ago by Mr. Quiller Couch—a religious author writing in a journal with a preponderantly religious following. He touched on the current calumny of the man without belief in God and immortality,—and he urged that his readers knew as well as he that when they wanted a man of honour and humanity to confide in they most probably looked to an agnostic. Without claiming so much as this, without enumerating the Stephens and Morleys and Harrisons that for years have adorned our letters and our public life, one asks oneself whether these cultivated clergymen can have had an experience of their fellows so different from that of this candid novelist and essayist that we can at least credit them with sincerity. It is impossible. The statement is an argument, a stratagem, a flimsy piece of theorising. It overrides for the moment every gentlemanly impulse, and closes its eyes to the pain and the heart-burn that many a gentle Christian mother will suffer as she broods over it and thinks of her wandering son. It is a mighty palliative —I will not say justification—of the violent language which often returns to these gentlemen. Did you ever meet a Christian who felt a moment's anxiety about his *own* character in the event of his ceasing to believe in Christian teaching? I never did. They could not face their fellows with an avowal that they were humane (when not defending the faith) and honourable only or chiefly because of reward hereafter, or because God willed it. They are proud of their own manliness. Their anxiety is ever for the welfare of others, for "the people."

What, then, is the ethic of Monism which these rhetoricians so completely ignore? One does not need a profound or prolonged research to find it. It rises out of the very ground on which they base their ignoble appeal. They would have us retain the outworn creed of Christianity because it has been an inspiration to character-forming, and because character and a quick sense of honour are amongst the most valuable qualities of life. They do not see that if honour, and sobriety, and high aims are of value in and for themselves, humanity will not lightly part with them, whether or no it reject the miraculous setting of them which the preacher commends. If "to eat and drink and be merry," to extinguish all ambition of spirit, to forego the visions of an Emerson or a Mazzini, to pour one's whole energy into money-making and sensual pleasure —if all these are social dangers and personal misfortunes, humanity will see to it that they are restrained. The issue is plain. If moral qualities may disappear without the faculties of man being stunted and the grace and glory of life being endangered, they will disappear. No power on earth will prevent it, now that man has begun to reflect. But if justice, and honour, and truthfulness, and self-control, and kindness are qualities that enrich and gladden the personal and the social life, they will be cultivated on that account. And as a fact, if we take a broad and true survey, the world was never richer in those qualities, yet the influence of dogma was never less. What does the humanitarian movement mean? What the movement for the extinction of the flames of war, the increase in philanthropic effort, the

[1] Sermon in the *Christian Commonwealth*, July 30, 1903. This was Mr. Campbell's first sermon in the City Temple, and must be regarded as an exceptionally deliberate utterance.

growing social service of the rich, and a score of other movements? What has shattered the barbaric doctrine of hell, and extinguished for ever the fires of persecution? A development of men's moral and humane feeling, which has proceeded simultaneously with a decay of belief.

But, we are told, you are still so near to the age of universal belief that the Christian ethic is in your blood in spite of you. You are severed twigs that are still green with the sap of the tree. I reply, firstly, that it is the modern rationalist and humanitarian movement that has *reformed Christianity*. Compare the degraded condition of Spain, where the Church has been able to stifle criticism, with England and Germany, where a century of criticism has been directed upon Christianity *from the outside*. And I reply, secondly, that we are perfectly conscious that the sap of Christianity is in our moral fibres. "We firmly adhere to the best part of Christian morality," says Haeckel (p. 120): and "the idea of the good in our monistic religion coincides for the most part with the Christian idea of virtue." Why should we be so foolish as to set aside the moral experience of the last 2000 years? It is the heritage of the race. We have been lifted above that petty sectarian attitude that distinguishes the church-member. We survey the whole moral and religious life of humanity as one broad stream. Christianity is a stage, a phase, in the continuous history of the world. It borrowed its ethic from Judæa, from Greece, and from Egypt. It was made in Alexandria, the centre at that time of the civilised world, and the converging point of three great spiritual streams. There is not a single ethical element in primitive Christianity that cannot be traced to its predecessors. Moreover, the notion that the Hebrews had a "genius for morality" has no longer even the semblance of plausibility. Read the 125th chapter of confessions or protestations in the Egyptian Bible, and you will find, a great Egyptologist (Budge) says, a system of morality "second to none among those which have been developed by the greatest nations of the world." And this chapter was *compiled*, from very much earlier teaching, fifteen centuries before Christ appeared, and at a time when the Hebrews were yet uncivilised. The *Book of the Dead*, as Dr. Washington Sullivan says, is so lofty that "if every vestige of Christianity were obliterated from the earth, it would provide an admirable ethical outfit for the reorganisation of morality in Europe." Further, we have within the last two years discovered the very source of that lofty morality with which the Hebrew prophets lifted their nation from its barbaric level. At a date when the Hebrews were sacrificing human victims to their idols, two thousand years before the decalogue in the Old Testament was written, the Babylonians (from whom the Hebrews obtained their wisdom and civilisation) were living at a very high level of moral idealism. The Code of Laws of Khammurabi—laws promulgated between 2285 and 2242 B.C.—is seen to be the foundation of the "Mosaic legislation." We now know, Dr. Washington Sullivan says, that the Hebrews "were positively *the last* of all the peoples of remote antiquity to discover those high truths of the moral life which constitute the unchanging foundation of society."[1]

But, while, in taking over from Christianity the moral heritage of humanity, we owe it gratitude for new development in some directions, we must with Haeckel acknowledge that it has overlaid moral truth with false ideals that must be set aside. I am not speaking merely of those mediæval horrors which all Christians avoid and evade to-day. I am thinking of some of the most distinctive features of the composite Christ-ideal. When Mr.

[1] *Ancient Morality*. The reader will find in this admirable booklet a fuller account of this and the preceding point. It can be obtained at a moderate price from "The Ethical Religion Society," Steinway Hall.

Campbell says that Christ "has manufactured more nobleness than all the moral codes in all the world put together," we see at a glance how little he knows of "all the moral codes" and what they have done. We who watch the advance of comparative religion and ethics, and of the criticism of the New Testament, know what will eventually become of this kind of Christianity which stakes its existence on the historical truth of the Gospels. Christ is dissolving year by year. But even when apologists have removed the stress from the (largely, at least) legendary person of Christ to that moral teaching which appears in the first century as "primitive Christianity," we still join issue with them. Haeckel has indicated several features of the Christian ethic which we cannot receive. Some of these features are already abandoned by our Christian neighbours. There is the ascetic principle, one of the most prominent elements of the Christ-teaching, which even the Catholic Church is quietly dropping. There is the Gospel of opposing violence by submission and Hooliganism by emptying your pockets, which one honest Anglican bishop has pronounced "impracticable." There is the contempt of art and nature, which follows from the ascetic principle. There is the commendation of virginity, which no one regards to-day, with its implication of the inferiority of marriage, so expressly preached by the Church fathers. There is the suppression of woman, inspired by the Old Testament teaching, which, as Mr. Lecky has shown, put back her emancipation (which the Romans were initiating) for more than a thousand years. All these were errors of the enthusiastic but ignorant compilers of the Christ-ideal, and the modern world agrees to abandon them.

We claim, further, that this moral teaching must be set once for all on a purely humanist ground. "With eyes fixed on the future," says the great Mazzini, "we must break the last links of the chain which holds us in bondage to the past, and with deliberate stages move on. We have freed ourelves from the abuses of the old world; we must now free ourselves from its glories. . . To-day we have to found the polity of the nineteenth century—to climb through philosophy to faith; to define and organise association, proclaim humanity, initiate the New Age." The doctrine of Hell and Heaven is no longer a fitting foundation for moral conduct, as most educated Christians recognise to-day. But the personality of God or the personality of Christ is just as little fitted. Have you ever seen how the little-minded villagers, along those parts of our coast where the sea is steadily invading the land, build time after time close to the edge of the cliff? "My grandfather lived there," some old man will tell you, pointing his lean finger out into the sea. And he knows that in twenty years more the cottage he has himself built will be undermined and swept away. That is the procedure of those theologians who base their ethic on the successively dissolving dogmas of Christianity. Their grandfathers staked the moral condition of the community on a belief in Hell; their fathers grounded it on faith in the supernatural character of the Bible. They are basing it to-day on belief in God and the historical reality of Christ. And year by year the waves of criticism and the tunnels of research are undermining their position. Let us retreat once for all from the land of dogma. Morality is too important a matter to be left at the mercy of scientific or historical controversies. Cling to your beliefs if you must—if you can; but in view of the controversy that surrounds them, and will soon thicken about them a hundredfold, do not seek to bind up the moral tone of the community with so frail a speculation.

People who imagine that this proposal to transfer the moral interest from the care of the Churches has a violent and unnatural character are little acquainted with the history of the subject. The leading writers on com-

parative religion assure us that, in the words of Professor Tiele, "in the beginning religion had little or no connection with morality." In other words, morality had a quite different and independent origin from theology. It was only at a fairly advanced stage in the development of priesthood that the notion was advanced of the gods being the authors and the priests the guardians of the moral law. We have seen how Babylon had the decalogue and an elaborate moral code centuries before the supposed giving of the tables to Moses on Mount Sinai. The existence of a fully-developed moral sentiment can thus be discovered ages before the first claim of a revelation. If, further, we study the moral feeling of the lowliest tribes, and ascend gradually through the semi-barbaric peoples known to history, such as the ancient Mexicans or our own forefathers, we can trace clearly enough the growth of the moral ideal. When men began to live in community they discovered that certain restraints must be placed on individual impulses. They saw the enormous advantages to each of a communal life, of co-operation and the division of labour, of mutual help and service, of substituting trial or arbitration for bloody combats, and of being able to trust each other. In other words, they discovered that, if they were to advance in the construction of social life, which promised so many advantages, certain new habits or rules or qualities were necessary. Justice, kindness, respect for age, care of youth, truthfulness, sobriety, and self-control were necessary. In proportion as they acquired these qualities their social life was healthy and effective. The individual gained far more than he had relinquished in the occasional restraint of his impulses. And in proportion as they fell away from this ideal their social life was enfeebled and disturbed. Thus there grew up a sense of the importance of the moral ideal—such a sense as we find, for instance, amongst the ancient Germans long before their contact with Christianity. In this way the decalogue came to be written. Man was its author. The experience of 200,000 years was his inspiration. And to-day, when we see how vitally necessary moral fibre is for progress in the exacting race of our national and international life, it is hardly likely that we shall return to the lawlessness of prehistoric life. There came a stage in the evolution of the moral ideal when men considered it so wonderful a thought that they hailed it as a gift of the gods, just as the Hebrews did when they composed, or borrowed, the legend of the giving of the law on Sinai. In this way morality became intimately associated with theology. It is probable that, whilst this association has hindered moral development in some ways—compare the stagnancy of the "ages of faith" with the great ethical advance of this "age of unbelief"—it has in other ways greatly promoted it.

However that may be, the time has come for humanity to claim its own from the gods. There is an obvious danger that, as the theological structure with which morality has so long been associated breaks up, morality may suffer for a time. Scepticism about the one naturally leads to scepticism about the other. To say that we should on that account refrain from hastening the dissolution of theology is the very reverse of wisdom or statesmanship. We must insist on the formation of a purely humanitarian ethic. We must jealously remove this deeply important interest from the arena of controversy. Our children must not be taught, as they are still taught, to restrain their impulses to lying, stealing, and unhealthy practices, merely on the ground of certain religious beliefs. In a few years they will hear those beliefs ridiculed and torn to shreds on every side, and it may be that the whole structure of their moral habits will be shaken to the ground. This is a grave social and humanitarian problem. Our educational authorities insist that moral training shall be given by the teacher only in connection with the legends of the Old Testament, which

are not taken to be historical by clerical scholars themselves to-day, or with the stories of the New Testament that are being rapidly reduced to myths. The child is too unsophisticated to see what is called a "symbolic truth" in these, and it is well known that the teachers in our schools, often with great repugnance to their own feelings, have to treat these stories as historical, or leave them to be considered historical. It is a pitiful situation, and ought not to be tolerated even by those who still adhere to religious beliefs.

An organisation has been created to meet this situation; to agitate for the introduction of purely humanitarian moral instruction for the children in our elementary schools, and to formulate schemes of such teaching and provide model-lessons and expert teachers to show its practicability. Already several local educational authorities have adopted the ideas of this organisation. But over the country at large the moral instruction of our children is still totally bound up with that teaching of the Bible which is to-day so seriously controverted. Every man, and especially every woman, who is alive to the folly and the danger of our present system should consider the aim and work of this organisation.[1]

A more difficult question arises when we turn to consider moral culture amongst the adult portion of the community. Dr. Haeckel is of opinion, as are very many rationalist writers, that we need look forward to no substitute for the Churches in this respect, except for a certain minority of the community. "The modern man," he says, "who has 'science and art,' and therefore 'religion,' needs no special church, no narrow, enclosed portion of space. For through the length and breadth of free nature, wherever he turns his gaze, to the whole universe or to any single part of it, he finds indeed the grim struggle for life, but by its side are ever 'the good, the true, and the beautiful'; his church is commensurate with the whole of glorious nature. Still, there will always be men of special temperament who will desire to have decorated temples or churches as places of devotion, to which they may withdraw." No doubt, when we have introduced an adequate scheme of purely natural moral instruction into our primary and secondary schools instead of leaving this most important section of the child's education to the casual observations of a reluctant and untrained teacher in the course of a Bible lesson, there will not be the same need for church-assemblies in later life. But it would seem that the tendency to form new groups and organisations for moral and humanitarian culture is on the increase. Already there is in the field an important "Ethical movement," with branches in America, England, France, and Germany, and with an international organ (*The International Journal of Ethics*) and international congresses. The English branch includes some twenty societies in London and the provinces, most of which are gathered into a Union of Ethical Societies,[1] and is spreading rapidly. It has an organ of its own (*Ethics*, one penny weekly), and takes an active part in all social and humanitarian work. There is also the Positivist Movement; and there are numbers of Humanitarian, Tolstoyan, and other societies with similar aims. Even churches and chapels are slowly casting off their raiment of dogma and speculation, and restricting their aim to moral culture. In many parts of England this transformation has already completely taken place. The tendency everywhere is in the direction of an abandonment of dogma, and a relinquishment of cosmic speculation to the philosopher and the scientist. Some

[1] I am referring to the Moral Instruction League. Its central office is at 19 Buckingham Street, Strand, London, W.C.; any inquiries addressed there will be promptly answered by the secretary. Branches of the League have been formed in various parts of the country.

[1] Central office at 19 Buckingham Street, London, W.C.

day our Churches will perceive at length that the belief in God is itself a cosmic speculation, exposed to a hundred hazards of discovery and controversy. Then, in the words of Emerson, "there will be a new Church, founded on moral science; at first cold and naked, a babe in a manger again, the algebra and mathematics of ethical law, the Church of men to come, without shawms, or psaltery, or sackbut, but it will have heaven and earth for its beams and rafters, science for symbol and illustration; it will fast enough gather beauty, music, picture, and poetry."

That Haeckel is right in this, his final judgment and expectation, none will question who have long observed the development of religious thought and church life. Strong and eloquent voices plead already within the Churches for the elimination of dogma, for an exclusive concern for moral culture. If the modern art of anticipation have any validity, it is certain that theological speculation and moral culture are severing their long association. We are taking the step that some of the great religions of the world took ages ago. Buddha, wiser in this than the founders of Christianity, pleaded solely for moral reform, and coldly discountenanced theological speculation. Enlightened Buddhists hold to the spirit of his teaching, though Buddhism has, as a whole, been unfaithful to his spirit. But another great oriental religion, Confucianism, the religion of the cultured Chinese and Japanese, had taken, centuries before Christ was born, the step we are taking to-day. The followers of Kung-Tse have for ages maintained moral culture without dogma. Their code, the *Buskido*, is the model code of the world. It is the turn of Christianity to make religion "the service of man" instead of "the service of God." If there be a God, he needs not the sacrifices, and he must disdain the flattery and adoration, of a poverty-stricken humanity. We must turn at length from the land of shadows, where the supernatural lurks, and pour the whole intense stream of religious emotion into the task of uplifting ourselves and our fellows. We must free the religious and moral ideal from every entanglement of controverted dogma, and set it on a natural base. Then will cease the long anxiety and the foolish resistance to every advance of thought. Then each new discovery will shed new light on our ideal, and science will be eagerly pursued.

"Oh Science, lift aloud thy voice that stills
The pulse of fear, and through the conscience thrills—
Thrills through the conscience with the news of peace—
How beautiful thy feet are on the hills!"

CHAPTER X

THE POSITION OF DR. A. R. WALLACE

THE reader will probably remember a famous passage in one of Huxley's essays where the anxiety that theologians betray, as the mechanical interpretation of the universe advances, is compared to the terror which savages exhibit during an eclipse of the sun. Whether Huxley had had a rude experience of that

ecclesiastical rhetoric, of which we have seen so much under the name of "criticism" of Haeckel, and had yielded to a malicious impulse in his choice of an analogy, we need not inquire. We have seen that the apologists are still eager to throw every obstacle they can suggest in the way of the advance, or of the acceptance, of the mechanical view. We have encountered them at every step in our course. Sometimes, indeed, we have found ecclesiastics with scientific qualifications desperately recommending us to read criticisms that aim at discrediting scientific procedure; as when Mr. Ballard tells his readers to study Stallo's *Concepts of Modern Physics*, a work "the most of which," says Sir O. Lodge, "is occupied in demolishing constructions of straw." But these tactics have long ago ceased to be effective. Science has won too solid a position in modern life to be shaken by the ill-informed criticism of Stallo or the academic subtleties of Professor Ward. Nor is the general reader greatly moved by the efforts of our modern theologians to sit in judgment on science in its own domain. The obvious plan for the Churches to adopt with the largest hope of success was to obtain, and give a wide publicity to, utterances by prominent scientists that tend to rehabilitate theology. I am not suggesting that these distinguished scientists only speak out under a strong pressure from the clergy. On the part of Sir O. Lodge, for instance, and Dr. A. R. Wallace, there is a very clear concern for religion, which is entitled to our full respect. But it cannot be denied that the use which is made by the clergy of these occasional utterances is gravely misleading. We have already seen this in the case of those German scientists to whom Haeckel refers as having changed their views. The only statement that Haeckel makes is that they have ceased to defend the positive views which he expounds in the *Riddle*; yet almost every clerical writer represents them as having, to use Dr. Horton's words, "come to recognise spirit as the author of consciousness"—this in spite of the fact that Haeckel expressly mentions Du Bois-Reymond's agnosticism on this point (p. 6). Dr. Horton, with his inclusion amongst the elect of the most notorious materialists that ever lived, has a title to leniency, in a sense, because of his obvious ignorance of the entire subject. The position of those apologists who have some scientific culture is more serious. These German scientists—Wundt, Baer, Virchow, and Du Bois-Reymond — are agnostics. Professor Haeckel assures me that in Germany the clerical writers call them "atheists." They lend no support whatever to even the most advanced and liberal form of theism. Writers who so thoroughly mislead the English public as to their position have little right to discuss the taste of Haeckel's analysis of his colleagues' views. The oriental saying about straining at the gnat and swallowing the camel is painfully pertinent.

We have now to examine those utterances on the part of English men of science which are so much quoted of late, and we shall find how little support they really give to the religious position. Of the later views of G. J. Romanes I will speak later, when we come to deal with the somewhat similar ideas of Mr. W. Mallock. Romanes saw to the end the terrible strength of the scientific position. It was only by an appeal to "extra-rational" and unscientific testimony that he sought to evade it. With Sir O. Lodge we need not deal in detail. His chief line of argument is of a teleological nature, and is exposed to the difficulties we have already indicated. Nor do I propose to deal with the spiritist convictions of Sir O. Lodge or Dr. Wallace, or (if they still exist) Sir W. Crookes, or (in a degree) Professor James. Spiritist evidence is a subject for personal investigation. We may also hold ourselves dispensed from dealing in detail with the views of the late Dr. St. George Mivart. They are not urged upon us to-

day.[1] But there have lately been published two remarkable pronouncements by distinguished English scientists, Dr. Wallace and Lord Kelvin, and these it is incumbent on us to examine. It is chiefly on the strength of these utterances that clerical apologists talk of a reconciliation of science and religion, if not of "a rehabilitation of religion by science." These utterances have, in their bald and misleading outline, been published throughout the country. We shall see, in this and the following chapter, how wholly ineffectual they were, how swiftly they were torn to shreds by the proper experts on the subjects involved, and how clearly the episodes show that the science of to-day is overwhelmingly favourable to the positions we have defended against Haeckel's critics.

Dr. A. R. Wallace, one of the most distinguished naturalists of our time, has long been famous for his opposition to the doctrine of the evolution of the human mind. This opposition, maintained in face of a remarkable and increasing consensus of scientists and scientific theologians, is ceasing to impress inquirers as it once did. The opinions of a man of such ability, expert knowledge, and candour, must always be examined with respect. But we have seen that the problem is very different to-day from what it was thirty years ago. To-day we all admit that evolution is a cosmic law: Haeckel says it is "the second law of substance," and the theologians say it is God's way of making things. We all admit the evolution of matter and the evolution of solar systems; and most of us admit the evolution of life and the evolution of species. On the other hand, we trace back the distinctive human institutions of to-day—art, civilisation, science, philosophy, religion, moral codes, and language—along a line of evolution to very primitive beginnings. Grant a glimmer of intelligence and reason in early man, and we can very well conceive the natural development of these institutions in the course of the last 200,000 years. We *must*, indeed; because we know that the prehistoric man, whose remains we unearth to-day, had not these things. We have, therefore, only to bridge the interval between the brain of the Neanderthal man and that of the anthropoid ape, between the mind of the highest animal and that of the lowest man. The difference is one of degree, not of kind. Comparative psychology finds in animals the same emotions and reasoning power as in man, only less highly developed. Further, we have a period of at least 600,000 years in which the advance might be effected. The anthropoid apes appear in the Miocene period (about 900,000 years ago). Man is not held to be developed from them, but from a common ancestor with them; so that from that period to the time when we find unmistakable trace of man (250,000 to 220,000 years ago) natural selection must have been at work. Finally, we have lately discovered a most important link in the chain of development (the *pithecanthropus*), and the study of the brain is, as we saw, suggesting some very remarkable and illuminating possibilities. If Canon Aubrey Moore could say that Mr. Wallace's view "had a strangely unorthodox look" sixteen years ago, it has certainly not lost its singularity in our day. When Dr. Haeckel went to Java, two years ago, on a scientific expedition, the Press assured us that he had gone to search for more bones of the pithecanthropus. As a fact, though his researches and travels took him within a hundred miles of the spot where Dubois found the famous remains in 1894, he did not go there. The evidence for the complete natural development of man is so great that such discoveries are unnecessary.

But Dr. Wallace has very recently entrenched his position with a very

[1] Had Mivart lived, the public would have seen a sensational development in the exposition of his later opinions. He told me, some years before his death, that he intended to speak out fully before he quitted the stage, and he frankly admitted that his scepticism was deep and his concern for religion little more than a belief in its moral efficacy.

remarkable attack on current scientific conceptions. He purports to undo a large and important section of the scientific procedure of our earlier chapters, and we must enter upon a thorough examination of his statements.[1] He says that the "new astronomy" entirely discredits that "cosmological perspective" which we have taken from Haeckel and supported with recent evidence. Instead of finding indications of infinity, he says, modern astronomers have discovered very definite limits to the material universe. Instead of our sun being a neglected and unimportant element in the stellar universe, it is the very centre, or near the centre, of the whole system. Instead of our earth being a very ordinary fragment of matter, torn, in some way, from the central mass, and forming a casual crust at its cooled surface, it is a unique body in the universe; it is fitted to support life in a way that no other planet of our system is, and that most probably no other planet in the universe is. Thus, instead of man being a mere casual product of natural development, he is the very centre and culmination of its processes, a unique creation, for whose production the whole universe seems to be one vast and orderly mechanism, set up for that purpose by a Supreme Intelligence.

If this is true, it is one of the most startling and dramatic discoveries ever made. Let me point out at once that if all this (except the last line) were established to-morrow it would not add one grain of evidence to the religious position, and would not break a line in the essential structure of Monism. The universe would still be a mechanism, with no indication of ever having begun to exist; and Dr. Wallace's teleological plea for a guiding intelligence would be as illogical as we have seen that argument to be. This new discovery would greatly impress (because it would greatly unsettle) the imagination, but would have no philosophical significance. Dr. Wallace says we could no longer attribute the appearance of life to chance; but we do not attribute it now to "chance." We attribute it to a mechanism which is *not* erratic, but fixed, in its action. Setting aside the imagination and the emotions, there is no more philosophic significance in the fact of the materials and conditions of life being found in just one cosmic body than in a million. Dr. Wallace seems to make much of the "remarkable coincidence" of these curious privileges of our planet with the actual appearance of life on it. Most people will think there would be some reason to use the word remarkable if the conditions were here and the life was not forthcoming. There is no religious significance in all that Dr. Wallace urges. But it is in direct opposition to much that we have established in the earlier stages of Haeckel's position, and we must examine the evidence adduced in support of it. If it is true, Monism can assimilate it without strain. We shall see that it is not only not proved, but the attempt to prove it only shows again the correctness of even Haeckel's minor positions.

It is, naturally, to astronomy that Dr. Wallace turns for evidence. He is not an expert in that science, but, of course, every philosophic thinker must borrow material from many different sciences. The truth is, however, that no sooner were Dr. Wallace's views published than there was immediately a loud and unanimous condemnation of them on the part of astronomers. The astronomers of France and Germany were frankly cynical about them, two of the leading French astronomers writing to combat them in *Knowledge*. Our chief English astronomers, of all schools, at once repudiated the alleged evidence. Professor Turner, the Savilian Professor of Astronomy at Oxford, said that Dr. Wallace had "not suggested anything new which was in the least likely to be true. He seems to me to have unconsciously got his facts

[1] The book he announces is not published as I write, so that I follow the two articles he wrote in the *Fortnightly Review* (March and September, 1903).

distorted, and to indicate practically nothing wherewith to link them to his conclusion." Dr. Maunder pronounced the new theory "a myth," and was not sure if Dr. Wallace intended the article to be taken as "a serious one." A number of other astronomers joined in the discussion, and, apart from one or two details in his evidence, not a single expert undertook to defend him. But we must examine his several positions in succession, so as to bring out once more the fact that Haeckel is supported by the most recent science.

The first point, and the most interesting for our purpose, is the contention that the new astronomy discovers the universe to have a definite limit. We have urged that Haeckel was in harmony with the evidence when he spoke of the universe as "infinite," so that here is a clear contradiction. It need not be said that the validity of Monism is not at stake in the matter. Whether the universe is limited or unlimited, it remains a Monistic universe. The question is whether Haeckel has misread the evidence of astronomy on this incidental question of limit or no limit. It is well to remember that "infinity" is a negative idea. It merely denies that there is a limit to the scheme of things. What we have to see, then, is whether the most recent investigations of astronomy point to the existence of such a limit or not.

The evidence for a limit on which Dr. Wallace lays most stress is, instead of being a study in "the new astronomy," a very old and threadbare fallacy. Flammarion says[1] it was "the subject of long and learned discussions during the course of the eighteenth century and up to the middle of the nineteenth," and he adds that "it would not be difficult to settle it to-day." The argument is that if the number of luminous stars were infinite the sky would be at night as bright as it is at noonday. The infinite number would compensate for the distance. But the actual star-light is only about one-fortieth the light of the moon, and that is only a five-thousandth of the intensity of the light of the sun. Dr. Wallace has taken this specious calculation from Professor Newcomb, but has, as Dr. Maunder points out, omitted two conditions which Newcomb carefully gives, and which make the speculation totally inapplicable to the actual universe. Newcomb's calculation assumed that no star-light was lost in transmission, and that "every region of space of some great but finite extent is, on the average, occupied by at least one star." Neither of these conditions is found in our universe. Light *is* absorbed in its passage to us; and the stars are distributed with nothing approaching the uniformity which the speculation demands. The second point needs no proof. The irregular structure of our stellar system is familiar enough; and there is not the slightest scientific difficulty about supposing that other stellar worlds may be separated from ours by immeasurable deserts of space. As to the absorption of light, a number of causes are pointed out. In the first place, we now know that there are dark as well as luminous stars. No astronomer supposes that these are less numerous than the light stars. Sir Robert Ball thinks they are so much more numerous that to count the stars by the light and visible spheres would be like estimating the number of horse-shoes in England by the number of those which are red-hot at a given moment. These dark stars must intercept the light of their incandescent fellows.[1] Dr. Maunder says that if we take them as a basis of our calculation

[1] *Knowledge*, June, 1903.

[1] In his second article Dr. Wallace replies that Mr. Monck has shown that, even if the dark stars were 150,000 times more numerous than the light ones, the sky would, if these were infinite, be as bright as moonlight. Once more Dr. Wallace omits a condition stipulated by his authority, who says this would be so if they "were distributed in anything approaching a similar density." For that we have no assurance whatever. Moreover, Dr. Wallace almost ignores the other and more important sources of absorption.

we could prove that "we are shut in by a veil which no light from an infinite distance could pierce."

But in addition to these incalculable dark stars there are other sources of absorption. The astronomer to whom Dr. Wallace appeals, Mr. Monck, holds that ether itself absorbs light. At any rate we know that space is full of cosmic dust—meteorites, etc.—and that this must be an important source of absorption. Mr. Monck says that, "if sufficiently remote, the star would thus for all practical purposes be blotted out." And Sir N. Lockyer also emphasises this factor. Moreover, we have just learned a further source. Before Newcomb's latest work was published, in February, 1901, a new cosmic element was discovered in the shape of a dark nebula. Certain peculiarities of a new star led to the discovery that it was surrounded by a nebula that reflected its light. Thus, we have the presence in space of another and powerful screen in the shape of dark nebulæ, the number and distribution of which we are unable to conjecture. Our universe is something infinitely removed from that theoretical system to which Professor Newcomb's calculations might apply. Thus, once more, does the very latest science come to our assistance. We may add that, even apart from the absorption of light and the irregular distribution of the stars, the calculation is enfeebled by another possibility. We have no proof that ether is continuous throughout infinite space. There may be several galaxies or stellar systems, unconnected by ether, so that one would not be visible to another. Assuming that (according to a calculation of Lord Kelvin's) there are a thousand million stars in our system, "there may be," says Flammarion, "a second thousand beyond an immense void, or a third, or fourth or more." And, finally, Professor Pickering has shown that, even with a continuous infinite ether, our present star-light is quite consistent with the existence of an infinite number of luminous stars, "if the distance between the stars becomes (on the average) greater the farther we go from the solar system," if we assume this to be central.

Thus the most emphatic of Dr. Wallace's proofs has been absolutely riddled by expert astronomical opinion. It is "founded," says Dr. Maunder, "on a careless reading of Professor Newcomb's book," and cannot be sustained for a moment.[1] Nor is his other line of argument more capable of defence. He urges that, although up to a certain point an increase in the power of the telescope reveals new worlds in greater number, this increase is not sustained in the case of our largest telescopes; and, in the case of photographs of the stars, an exposure beyond three or four hours does not bring us into touch with an increasing number of worlds. From this he would infer that the powerful instruments we use to-day have exhausted the universe and brought us to its extremities. If the number of stars were infinite, an increase of power or exposure should always reveal new worlds. Once more, Dr. Wallace has drawn his conclusion too precipitately. In the first place, as I said, there is the possibility of other systems being cut off from ours by empty space. But there is a simpler and readier answer to his argument. The fact to which he appeals—in so far as it *is* fact; a study of the long-exposure photographs of Dr. Isaacs by no means sustains it[2]—really means that we are approaching the limit of the effective range of the telescope, not the limit of objective reality. Every increase in the aperture of a refracting telescope means

[1] Nor is Professor Newcomb's book itself above dispute, great as is the authority of the writer. Mr. R. A. Gregory, reviewing it in *Nature* (March, 1902), says that "the outlook described is not only limited, but imperfect," and points out a number of errors in it.

[2] In his second article Dr. Wallace appeals to these photographs, but makes it clear that he has in mind photographs of nebulæ and star-clusters. It is obvious that there must be a limit to the number of stars in a given cluster or nebula; but the eight-hour exposure photographs of other parts of the heavens read differently.

an increase in the absorption of light by the lens itself. We are, Dr. Maunder says, approaching the limit beyond which the absorption will neutralise the advantage of a large objective. So in the case of stellar photography, it is only when we deal with "medium luminosities" that a longer exposure avails. Thus Dr. Wallace not only exaggerates the fact—Mr. Monck, for instance, speaks of "the constant detection of additional stars by more powerful instruments"—but he misinterprets its significance. He has not, says M. Moye, "brought any convincing proof against the universe being infinite." "Space cannot be otherwise than infinite," says M. Flammarion; a limit to either space or time is unthinkable. The latest researches of astronomers bring us no nearer than ever to a limit of the material universe.

Dr. Wallace's second point, that our planet occupies a significant central position in the universe, collapses of itself when he fails to prove that that universe is finite. There is no centre in infinity. But, as Dr. Wallace has committed the radical error of "reasoning from the area we see to the infinite," it is at least interesting to examine how far our sun may be described as occupying a central position in the vast stellar combination we call the Milky Way. Now, it has long been obvious that our sun is roughly in the centre of this huge system. We have only to glance at the great belt of light the system forms around us in the heavens to see this. But astronomers once more totally reject the expression of this fact which Dr. Wallace presents. The system is so irregular in structure that we could not with propriety assign a definite centre to it if our knowledge were greater than it is. You may talk of the centre of a bowl, says Professor Turner, but you cannot talk of the centre of a saucepan; and there is a projection of the system visible in the southern heavens which answers to the "handle" in this figure. Flammarion believes there are clusters in the heavens that do not belong to our system at all. Moreover, even if we consent to speak of a "centre" of this irregular structure, with its clefts and projections, it is wholly inaccurate to say that our sun is awarded that position by astronomy. Mr. Monck doubts "if any astronomer could go within one thousand light years of the centre of the star system as at present known"; that is to say, in non-technical language, no astronomer would venture to assign a centre within the broad limit of 6000 billion miles! Other astronomers think it clear that we are nearer one side of the system than its opposite, and point out that if the motion of our sun (about ten miles a second) is in a curve determined by gravitation (as it surely is) round the centre of gravity of the solar system, it must be at an enormous distance from that centre, as we can learn from the analogy of motion in a globular cluster. All agree that we have no greater right to consider ourselves in a central position than are fifty other suns, the nearest of which is twenty-five billion miles away from us.

Thus Dr. Wallace has once more considerably strained the evidence in order to vindicate a central position for us. But there is a further consideration which must be taken into account. Our sun is calculated by astronomers to be travelling through space at about ten miles per second. Dr. Wallace seeks to enfeeble this doctrine of astronomy, when it is turned against him, by urging that the motion is relative; it may be the stars that move while we remain stationary. That is to say, he would suggest an anomalous character for our sun without a shadow of proof and in direct opposition to the law of gravitation, which he himself invokes at other times. The idea of a vast central sun, round which all the stars in the Milky Way would revolve, as planets do round a sun, has been long since rejected by astronomers. Its mass would have to be incalculable; and the mass of our sun is small compared with that of its measurable neighbours. To save itself from being sucked in (or impelled

towards) its gigantic double and triple neighbours it must move. It is probable that it follows a curved path round the common centre of gravity of our system (not a central mass). In any case the curve of its path is so great that astronomers can as yet detect no curve at all. It follows that, if to-day we happen to occupy a central position, it is only a temporary occupation. Many of Dr. Wallace's critics argued on the supposition that our path lay in a straight line through the universe, but others pointed out the probable curve, so that Dr. Wallace does not escape the point by rejecting rectilinear motion. He had argued that the special advantages which this supposed central position gave to our sun had been enjoyed by it during the whole period of the evolution of life. Astronomy wholly discredits that assumption even when we bear in mind all that he urges as to the relativity of cosmic movements.

Let us next examine the advantages which our planet is supposed by Dr. Wallace to possess in the way of habitability. The conditions of life which he enumerates are the usual conditions of a certain temperature (say, between 0° C. and 75° C.), a circulation of water, and an atmosphere of proper density and extent to effect this. Our own distance from the sun, with an atmosphere and tidal movements to equalise the distribution of heat and cold, ensures a moderate temperature. Our deep, permanent oceans hold a supply of water, which is admirably circulated by the heat of the sun, controlled by the atmosphere, and assisted by the dust which our deserts and volcanoes largely contribute. Thus we have, he thinks, in the position of our planet, its distribution of land and water, its atmosphere, its satellite, and its physical features, a combination of favourable circumstances that is not likely to be found elsewhere. The distance of the other planets from the sun is either too great or too little. Atmosphere is largely determined by mass, and so Mars is in this respect disqualified. Venus has no moon, and this "may alone render it quite incapable of developing high forms of life." We know, he says, with "almost complete certainty" that this combination of favourable conditions is not found on any other planet in our solar system.

To this series of affirmations the expert astronomical critics oppose a very decided series of negatives. "In our solar system," says Flammarion, "this little earth has not obtained any special privileges from Nature." M. Moye regards our earth and sun as "very ordinary orbs, having no special characteristics, and as no more suitable for life than innumerable other suns and planets." Mr. Monck has "sufficient faith in the principle of evolution to think that man might accommodate himself to the conditions of life on almost any of the planets, provided that the change were sufficiently gradual, and a sufficient time were allowed to elapse." It is true that Miss Clerke says, "Dr. Wallace's contention, that our earth is unique as being the abode of intellectual life, corresponds in a measure with the recent trend of astronomical research." Miss Clerke, it is not impertinent to observe, approaches the subject with the same prejudice as Dr. Wallace about the uniqueness of man, but the phrase "in a measure" saves the passage from inaccuracy; and she later makes an exception in favour of Mars. But the whole idea of seeking identical conditions in other planets is erroneous. "To limit the work of Nature to the sphere of our knowledge is," says Flammarion, "to reason with singular childishness." They are of the same material as the earth, and have been evolved by the same forces; there is likely to be a general likeness of features, and that is enough for our purpose, when we remember the infinite adaptability of the life force. M. Moye examines in detail the conditions Dr. Wallace lays down, and points out many errors. To say that Mars is disqualified on account of its smaller mass than the earth is "a purely

gratuitous assumption." Aqueous vapour has been detected by the spectroscope in the atmospheres of at least Venus and Jupiter. Tidal motion is caused by the sun as well as the moon, and may be so caused in Venus; nor is it essential to life. "The distance from the sun to the earth in the general plan of our solar system is not peculiar or extraordinary in any way." While, as to deserts, each of the other planets must, on Wallace's theory, be one vast desert; nor have we any ground for thinking that deep, permanent oceans are a peculiar feature of our planet.

It would, of course, be no more than an interesting discovery, of no grave consequence to Monism, if our planet were proved to be the only habitable body in our solar system; but astronomers utterly discountenance the idea. "Life is universal and eternal," says Flammarion, almost in the words of Haeckel. "Yesterday the moon, to-day the earth, to-morrow Jupiter . . . Let us open the eyes of our understanding, and let us look beyond ourselves in the infinite expanse at life and intelligence in all its degrees in endless evolution."

Professor Turner points out that Dr. Wallace has completely failed to show, after all his laborious proof of our central position, that this would give our earth any advantage in the way of habitability. He says that Dr. Wallace, "with the deftness of a conjurer," has substituted for this question a discussion of the impossibility of there being life at the confines of the universe. It is true that Dr. Wallace has since admitted that he had no proof to offer at the time, but will present one in his forthcoming work. However, we may profitably close with a glance at his attempt to prove that life is impossible towards the imagined limits of our system. Even his fellow spiritualist, Miss A. Clerke, protests that "it cannot be reasonably supposed that the conditions of vitality deteriorate with remoteness from the centre"; and Dr. Wallace has been forced to admit that the reasons he suggested were ill-considered and erroneous. He surmised that gravitation might be less at the verge of the system; which is not only "a pure assumption," but is opposed by our knowledge of the most distant double stars. He compares the movements of the stars with the molecules of a gas, and is eventually compelled to acknowledge that "there is probably no justification for the idea." And he quite gratuitously supposes that the action of electric and similar rays is different at the edge of our stellar system than it is elsewhere.

We may conclude, then, that Dr. Wallace's excursion into astronomy has been singularly and painfully disastrous. In general and in detail his theory is shattered to fragments by the criticisms of all the experts who join in the discussion. The idea of man's spiritual uniqueness obtains no support whatever from the great cosmic investigations of "the new astronomy." On the contrary, the most recent discoveries and speculations confirm the "cosmological perspective" which Haeckel urges in his *Riddle of the Universe*. We have no ground in scientific evidence for assigning limits of time or space to the material universe; we have no ground for believing that man is a unique outcome of natural evolution, and that "the supreme end and purpose of the vast universe was the production and development of the living soul in the perishable body of man"; and we have no ground for thinking there is so peculiar a combination of circumstances in our planet as to force us to appeal to a Supreme Intelligence.

Chapter XI

LORD KELVIN INTERVENES

Whilst this storm of astronomical indignation was beating about the luckless pronouncement of Dr. A. R. Wallace, the second intervention on behalf of religion, of which I spoke, took place. Once more, it is important to observe, the intervention consisted of a declaration by a distinguished scientist that some science *other than his own* tended to support conventional religion by its recent investigations. Dr. Wallace, the naturalist, purported to speak for astronomy; and we have seen what the astronomers themselves made of his declarations. Lord Kelvin, the most distinguished living physicist, assured the world that biology was coming to recognise a field of phenomena with which it was so incompetent to deal that it was retreating to the old notion of a "vital principle" and the action of "Creative Power." We have now to see what our biologists had to say about this statement of their attitude.

The circumstances of Lord Kelvin's pronouncement will be easily recalled. Certain of the students of the University College, London, have formed themselves, or been formed, into a "Christian Association," and have lately set about "converting" their less religious fellows to the belief in their particular cosmic speculations. A series of lectures was arranged for the spring of this year, the Botanical Theatre of the University College was somehow secured, and a certain show of scientific names was scattered over the programme. The first lecture was by the Rev. Professor Henslow (M.A., F.L.S., F.G.S.), and a vote of thanks was accorded to the lecturer by Lord Kelvin for his "examination of Darwinism." The second lecture, on "The Book of Genesis," was given by the Dean of Canterbury, and the chair was taken by Sir Robert Anderson (K.C.B., LL.D.). The Rev. Professor Margoliouth gave the third lecture, on "The Synoptic Gospels," and was supported by a distinguished physician (Sir Dyce Duckworth) and a military man. The other two lectures were also given by reverend lecturers, and were supported by Sir T. Barlow, M.D., and Mr. Augustine Birrell. Lord Kelvin was the lion of the display, and his few closing words were at once published from end to end of England. He claimed that "modern biologists were coming once more to the acceptance of something, and that was a vital principle." He asked: "Was there anything so absurd as to believe that a number of atoms by falling together of their own accord could make a crystal, a sprig of moss, a microbe, a living animal?" And he concluded that this was an appeal to "creative power." On the following day he re-affirmed his opinion, with a distinction, in a letter to the *Times*. He wrote: "I desire to point out that while 'fortuitous concourse of atoms' is not an inappropriate description of the formation of a crystal, it is utterly absurd in respect to the coming into existence, or the growth, or the continuation of the molecular combinations presented in the bodies of living things. Here scientific thought is compelled to accept the idea of Creative Power. Forty years ago I asked Liebig, walking somewhere in the country, if he believed that the grass and flowers which we saw around us grew by mere mechanical forces. He answered, 'No, no more than I could believe that a book of botany describing them could grow by mere chemical forces.'"

The echo of this sturdy utterance is still reverberating through the provinces, soothing the anxious feelings of thousands of believers, and being triumphantly quoted against the unbeliever. In London its echo was quickly drowned in a chorus of condemnation. Lord Kelvin's letter was at once followed in the *Times* by letters from three of our most eminent experts on the subject he had ventured to touch, as well as by letters from Mr. W. H. Mallock, Professor Karl Pearson, and Sir O. Lodge. The three experts unanimously condemned Lord Kelvin's statement, as did also Mr. Mallock and Professor Pearson; and even Sir O. Lodge said that "his wording was more appropriate to a speech than a philosophical essay," it had a "subjective interest," but he "would not use the phrase himself." Sir W. T. Thiselton-Dyer, our most distinguished botanist, complained that Lord Kelvin "wiped out by a stroke of the pen the whole position won for us by Darwin," said that the reference to a fortuitous concourse of atoms was "scarcely worthy of Lord Kelvin," and "denied the fact" that "modern biologists were coming to accept the vital principle." Sir J. Burdon-Sanderson, the Regius Professor of Medicine at Oxford, while resenting the strong terms of Sir W. T. Thiselton-Dyer's censure of Lord Kelvin's personal procedure, said that it had been demonstrated to the satisfaction of physiologists that "the natural laws which had been established in the inorganic world govern no less absolutely the processes of animal and plant life, thus giving the death-blow to the previously prevalent vitalistic doctrine that these operations of life are dominated by laws which are special to themselves." Professor Karl Pearson was astonished that an institution with accredited professors in biology "should open its doors to irresponsible lecturers on 'directivity,'" and said that "if Lord Kelvin wishes to attack Darwinism, let him leave the field of emotional theological belief and descend into the plane where straightforward biological argument meets like argument."

Professor E. Ray Lankester, from the side of zoology, said: "I do not myself know of anyone of admitted leadership among modern biologists who is showing signs of 'coming to a belief in the existence of a vital principle,'" and that "we biologists, knowing the paralysing influence of such hypotheses in the past, are unwilling to have anything to do with a 'vital principle,' even though Lord Kelvin erroneously thinks we are coming to it," and "we take no stock in these mysterious entities." Sir O. Lodge, drawn by an allusion to his belief in telepathy, took occasion to disclaim and deprecate Lord Kelvin's use of the phrases "creative power" and "fortuitous concourse of atoms."

With these weighty and emphatic pronouncements from some of the ablest biologists in this country—without a single line in defence of Lord Kelvin, either by himself or by any known expert—we might dismiss Lord Kelvin's intervention as the most unfortunate episode of his career, and as a pitiful failure to give the slenderest support to the reverend lecturers of the Christian Association. But an appeal to authorities is a fallacious and unsatisfactory settlement. We shall better vindicate the strength of Haeckel's position by a brief analysis of this most recent attempt to demolish it.

Let us see, then, first what truth there is in the statement that "modern biologists are coming once more to a firm acceptance of the vital principle." This three of our most representative biologists, Sir W. T. Thiselton-Dyer, Professor Ray Lankester, and Sir J. Burdon-Sanderson, flatly deny. Clearly Lord Kelvin was guilty of the gravest impropriety in saying that "modern biologists are coming," &c., and "scientific thought is compelled," &c. The implication of these phrases is obvious, and it is totally untrue. When Professor Ray Lankester, one of the most distinguished biologists, tells us he does "not know of anyone

of admitted leadership among modern biologists" who is accepting the vital principle, it is clear that the statement was gravely misleading. That there is a certain revival of vitalistic ideas is another matter. The clergy need not have waited for Lord Kelvin's assurance to that effect. In the fourteenth chapter of the *Riddle of the Universe* Professor Haeckel long since informed us of that revival. It would not be surprising—ironic as the circumstance would be—to learn that Lord Kelvin obtained the grain of fact which underlay his assertion from Haeckel's book. In all countries there have been of late years a few scientific men of secondary rank who have urged the acceptance of something more or less resembling the old vital force. Professor Lionel Beale and Dr. Mivart are well-known advocates of "vitality" in this country; several French biologists still speak of the vague *idée directrice* which Pasteur imagined to control the growth of the organism; in America, Cope and Asa Gray advocate a form of vitalism; in Germany it is urged by Nägeli, Bunge, Rindfleisch, Dreisch, and Benedikt, in Italy (more or less) by Gallardi, in Denmark by the botanist Reinke. The ideas of these writers differ considerably, but they agree in holding that some directive or "dominant" principle must be superadded to the physical and chemical forces of the organism.

We have seen in an earlier chapter how "modern biologists" as a class, and "scientific thought" as a whole, wholly reject the vitalistic hypothesis, and maintain that we have no reason to go beyond ordinary natural forces. We have seen what Professor Le Conte, Professor Ward, Sir A. Rücker, Sir J. Burdon Sanderson, Professor Dewar, and others, say of the condition of "scientific thought." "For the future the word vital, as distinctive of physiological processes, might be abandoned altogether," said Sir J. Burdon-Sanderson, and our recent authorities fully concur with him. Professor Beale is one of those scientists who would sing a joyful *Nunc Dimittis* if he saw any important sign of the revival of vitalism. But if Lord Kelvin consults his most recent publications he will find only a deepening of the pessimism which Professor Beale has expressed on the matter for the last twenty years. In *Vitality—V.*, published two years ago, he tells us the very reverse of the assurance of Lord Kelvin. "Probably no hypotheses or doctrines known to philosophy or science," he says in his preface, "have been so generally favoured, and more persistently forced on the public by 'Authority,' and therefore widely accepted and taught by educated and intelligent persons, than doctrines of physical life and its origin in non-living matter" (p. vii); and later he says: "Purely mechanical views of life are again, possibly for the last time, becoming very popular" (p. 5). Further on he quotes Professor Dolbear as saying (in his *Matter, Ether, and Motion*) that "there is little reason to doubt that when chemists shall be able to form the substance Protoplasm it will possess all the properties it is now known to have, including what is called life; and one ought not to be surprised at its announcement any day"; and he refers us to the appendix of Professor Dolbear's book for a long list of weighty pronouncements in favour of the mechanical hypothesis. We may, therefore, dismiss once for all the attempt to commit "modern biologists," as a class, to a belief in vital principles and creative powers as a serious, though unintentional, misstatement—one that it is painful to find over the name of Lord Kelvin.

Haeckel was perfectly right. He awarded a larger proportion to Neo-Vitalism than any of our own biologists (even Dr. Beale) are prepared to do, but he rightly claimed that the mechanical view of life was the predominant one in biology to-day. Sir W. T. Thiselton-Dyer, writing of Huxley (*Nature*, June 5th, 1902), said: "Huxley was firmly imbued with what is ordinarily called a 'materialistic conception' of the universe,

I think myself that this is probably a true view." The representation that Haeckel is alone, or almost alone, in his view of life is a gross and audacious *mis*-representation.

And when we come to examine on its merits this revival of vitalism—such as it is—we find it has no promise whatever of gaining wide scientific recognition, because it rests essentially on a familiar fallacy. The reader who wishes to study the grounds of it may consult Professor Beale's various editions of his *Vitality*, or Reinke's *Welt als That*, or Dreisch's *Die organischen Regulationen*, where all the evidence of the Neo-Vitalists is ably mustered. Happily it is not necessary for us to cover the whole ground of this evidence even superficially. As we saw in the case of teleology, the principle of the argument is one, however infinite may be its applications; and it is the principle itself that lacks logical validity. There are, the Neo-Vitalist urges, scores of features of the life of the animal or plant that the biologist cannot explain by chemical and physical forces; therefore we must have recourse to a non-mechanical or new kind of force—an *idée directrice*, a "dominant," a "vital power," and so forth. What these inexplicable phenomena are we need not consider at any length; they are such phenomena as—the processes of segmentation and differentiation in the growth of the embryo, the selection of food from the blood or surrounding media, the replacing of tissues or organs that have been cut away (in the hydra, the newt, and even higher animals), the formation by an animal of a protective anti-toxin, the acquisition of protective mimicry, the power of adaptation in organs to changes in environment, and so on. There are, every biologist admits, scores of phenomena which are not as yet capable of explanation by mechanical forces; and the new vitalist urges that these point to the presence of a specific principle in the animal or plant. "Up to this day," says Professor Beale, "no cause, no explanation, can be found, and therefore we attribute those vital phenomena to Power—to Power which is special and peculiar to life only, power which we know cannot be derived from matter. Is it not, therefore, perfectly reasonable to believe that all vital power has come direct from God?"[1]

The reader will at once recognise the principle of the argument. It is that familiar sophism which has made the theistic doctrine "a fugitive and vagabond" (to borrow the words of Dr. Iverach) in scientific territory for the last century or more. It is the sophism that Laplace expelled from astronomy, Lyell from geology, Darwin from phylogeny, and that we have found desperately clinging to every little imperfection of our scientific knowledge of the universe. It is a philosophy of "gaps." It is the familiar procedure of taking advantage of the temporary imperfectness of science. It is an argument that has been wholly discredited by the advance of science, sweeping it from position after position; it is as superficial philosophically as it is unsound in logic and prejudicial in science. "The action of physical and chemical forces in living bodies can never be understood," said Sir A. Rücker, "if at every difficulty and at every check in our investigations we desist from further attempts in the belief that the laws of physics and chemistry have been interfered with by an incomprehensible vital force." "The revival of the vitalistic conception in physiological work," said the president of the physiological section (Prof. Halliburton, M.D., F.R.S.) at the British Association meeting of 1902, "appears to me a retrograde step. To explain anything we are not fully able to understand in the light of physics and chemistry by labelling it as vital, or something we can never hope to under-

[1] Dr. Beale's last conclusion is not, of course, shared by the continental Neo-Vitalists. Even if we were forced to admit a specific vital principle, it would not "come from God" any more than other natural forces. But the analogy with Lord Kelvin's vague phraseology is noticeable.

stand, is a confession of ignorance, and, what is still more harmful, a bar to progress. . . . I am hopeful that the scientific workers of the future will discover that this so-called vital force is due to certain physical or chemical properties of living matter, which have not yet been brought into line with the known chemical and physical laws that operate in the inorganic world. . . . When a scientific man says this or that vital phenomenon cannot be explained by the laws of chemistry and physics, and therefore must be regulated by laws of some other nature, he most unjustifiably assumes that the laws of chemistry and physics have all been discovered." "We think," says Prof. Ray Lankester, "it is a more hopeful method to be patient and to seek by observation of, and experiment with, the phenomena of growth and development to trace the evolution of life and of living things without the facile and sterile hypothesis of a vital principle." If we accepted it, says Weismann, "we should at once cut ourselves off from all possible mechanical explanation of organic nature."

It is very difficult to reconcile Lord Kelvin's present attitude with the principle he laid down in 1871, and presumably still holds. "Science," he said, "is bound by the everlasting law of honour to face fearlessly every problem which is presented to it. If a probable solution, consistent with the ordinary course of nature, can be found, we must not invoke an abnormal act of Creative Power." Prof. Dewar reproduced this passage in this very application in his presidential speech of last year; and within a few months we find Lord Kelvin approving the attitude of those few biologists who depart from that principle to-day, and, impatient at the slow growth of our knowledge, rush to the conclusion that science must abandon this portion of the cosmological domain to the theologian once more. Lord Kelvin quotes Liebig, who was not a biologist, and who lived in an earlier scientific period.[1] But immense progress has been made since Liebig's day in the mechanical interpretation of life.[2] Lord Kelvin also would have us think that the only alternative to the "vital principle" is "the fortuitous concourse of atoms." Even Sir O. Lodge is stirred to protest against this descent from the level of science to the level of Christian Evidence lecturing. We have seen that science discovers only the work of fixed, determinate forces, not erratic and confused agencies. "The whole order of nature," says Prof. Ray Lankester, "including living and lifeless matter—man, animal, and gas—is a network of mechanism." There is nothing "fortuitous" whatever in the concourse of atoms."

We have, then, to set aside the unfortunate and undefended utterance of Lord Kelvin, and the claims of old-

[1] It is not a little amusing to find that this famous German chemist, whom Lord Kelvin introduces as a friend to Christian Associations in England, was regarded as an atheist by similar bodies in Germany in his own time. When Bishop Ketteler urged the Grand-Duke of Hesse to take restrictive measures against materialists, the Grand-Duke pointed out that Liebig had recently undertaken to refute them. "Don't make too much of that, your highness," said Ketteler; "Liebig is a materialist himself at the bottom of his heart." (Büchner's *Last Words on Materialism*, p. 42.)

[2] Dr. Horton assures us, about Haeckel's carbon-theory, that "no leading man of science treats it seriously, and it only has its whimsical and uncertain place in the rationalist Press which gulls the ignorance of the public." One wonders what it is *not* possible to say from a pulpit. Compare the words of the expert reviewer of Professor Verworn's *Biogen-hypothese* in *Nature* (February 26, 1902): "It seems quite clear from the results of numerous investigators that, whatever the nature of the sequence of chemical events, the carbohydrates are proximately the substances that are most intimately affected." Let me add here also a reference to a letter from Sir O. Lodge to *Nature* (December 4, 1902) in which he points out the possibility of germs being preserved intact in the cold of space. It was thereupon shown, not only that Lord Kelvin's old hypothesis of the origin of life assumed a new importance, but that, as W. J. Calder said, "if it is proved that vitality can survive for a protracted period in such circumstances, the conclusion that it is a molecular function seems inevitable." The most recent experiments of life at very low temperatures confirm this.

fashioned Vitalists like Dr. Beale[1] and Neo-Vitalists like Reinke. Our knowledge of vital phenomena, and of chemical and physical forces, is as yet very imperfect. The vitalist hypothesis supposes that our knowledge is complete, and that we clearly see certain features of life to be beyond the range of mechanical explanation. We see ourselves how illogical and temporary such a position is, and we are not surprised to find the leading biologists standing solid with Prof. Haeckel for a mechanical interpretation and mechanical origin.

Sir O. Lodge, the persuasive and able and ever courteous leader of the Birmingham University, offers another version of Neo-Vitalism which it is proper to consider. In a paper which he read to the Synthetic Society at London on February 20 of this year (published in *Nature*, April 23) he observes that "if guidance or control can be admitted into the scheme by no means short of refuting or modifying the laws of motion, there may be every expectation that the attitude of scientific men will be perennially hostile to the idea of guidance or control." He therefore proposes a theory of guidance (to apply to the divine guidance of the world, the human will, and the vital principle) without interference. He distinguishes between force and energy—or static and dynamic power. A column supporting a building, or a channel guiding a stream, is a force, but does not produce energy. The action of life is to be conceived as that "of a groove, or slot, or channel, or guide." "Guidance and control are not forms of energy, and their superposition upon the scheme of physics perturbs physical and mechanical laws no whit, though it may profoundly affect the consequences of those laws." Thus life becomes "something the full significance of which lies in another scheme of things, but which touches and interacts with the material universe in a certain way, building its particles into notable configurations for a time—oak, eagle, man—and then evaporating whence it came."

The objections to Sir O. Lodge's theory (which seems to be not unlike that vaguely suggested by Pasteur) may be well indicated by following his own words. He will not admit that life is a form of energy (thus rejecting both the old Vitalist and the Monistic theories) because "energy can transform itself into other forces, remaining constant in quantity, whereas life does not transmute itself into any form of energy, nor does death affect the sum of energy in any way." The sentence is hardly consistent. If death has not affected the *sum* of energy it must have transmuted it, for most certainly the energies in the dead body differ from those of the living. To assume that the energies are the same, but that which differs is *not* energy, looks like a begging of the question. Indeed, it is impossible to conceive life otherwise than as energy. We might regard the structure as a static force in Sir Oliver's sense, but there must be a living energy in addition. The death of the animal is like the death of the motor-car. The energy has been transmuted, or has returned into the elemental forms belonging to the several parts of the now irreparable structure. Then, as a later writer in *Nature* points out, it is the place and the ambition of science to explain the direction or determination of working energy as well as the origin of the energy. Sir Oliver gives the illustration of a stone falling over the cliff; it may make a harmless dent in the sand, or it may be guided to the firing of a charge of dynamite. So with the passage of a pen over paper; it may make a series of unmeaning daubs (if it rolls mechanically) or it may be guided in the signing of a treaty of war or peace. But it is in each one of these cases the function of scien-

[1] At the eleventh hour I discover a lengthy reference to the *Riddle of the Universe* in an obscure corner (p. 65) of Dr. Beale's *Vitality—V.*, so that the announcement in the *Times* was not wholly in vain. But as the notice does not contain a line of definite and tangible refutation of any statement in the *Riddle* I am compelled to forego the pleasure of dealing with it.

tific explanation to trace the energies which determine the line of motion as well as to trace their origin and proper motion. We cannot conceive of energies being directed except by energies. In the case of the upbuilding of an organism it is impossible to conceive the particles being guided to their several places, or the energies being impelled to put them in their several places, by something that is not an energy. In the parallelism which Sir Oliver suggests we can only see "life" as a superfluous partner. If the mechanical scheme is complete, as he seems to suggest it will be, it must contain an explanation of the direction of energy. To say otherwise is to declare again the inadequacy of mechanical theory (solely because its ever-growing material is as yet comparatively scanty) and to court the "perennial hostility" of men of science.

Thus the second attempt to prove that Haeckel's views rest on "the science of yesterday," and are contradicted by the science of to-day, fails as ignominiously as did that of Dr. Wallace. Our leading biologists declare emphatically that they and their science accept the mechanical, if not (as Sir W. T. Thiselton-Dyer says) the materialistic view of life. This interpretation of life must for some time to come leave unexplained considerable tracts of vital phenomena. Haeckel has never pretended that he "has explained everything." But so far as our knowledge goes, we find only ordinary natural forces at work in the living organism, and we should be wholly unjustified in the present condition of science in assuming that they are incompetent to explain the whole of life. We gain nothing whatever philosophically by simply sticking the label "vital" on these mysterious phenomena, and we are forbidden by the elementary laws of logic and scientific procedure to bring in such entities as "creative power" and "vital principles" as long as "a solution consistent with the ordinary course of Nature" can be suggested.

CHAPTER XII

MR. MALLOCK'S OLIVE-BRANCH

THE last critic of Haeckel's position —last, that is to say, in the logical order which it seems expedient to follow—is the distinguished essayist, Mr. W. H. Mallock. Professor Haeckel, it will be remembered, intended his work to be, not only a comprehensive statement of his views, but a summary of the issues of the many conflicts between religion and science in which he had played so conspicuous a part during the nineteenth century. Mr. Mallock, declaring that neither theologian nor scientist was competent to analyse those issues quite impartially, undertook, as a neutral observer, to balance the controversial ledgers of the departed century on his own account. It may be granted that Mr. Mallock occupies a position of some advantage for the discharge of this function. He is adequately informed, philosophic in temper, and neutral in the sense that he clearly does not believe in theology, yet strongly opposes the final conclusions of the scientists. To use an expressive colloquial phrase,

he has sat on the fence throughout the last forty years, and shot his sharp criticisms at the combatants on both sides with a certain impartiality. But those who are acquainted with his attractive writings know that he has really only riddled the theologians for their ultimate advantage; whilst he has attacked the Agnostics in the interest of religion. However, an analysis of his last publication, *Religion as a Credible Doctrine*, will serve not only to clear up the popular mystery about his position, but to show us an interesting plea for the retention of theology, even admitting that we have fully established the theses of the preceding chapter.

Mr. Mallock emphatically rejects the idea of hampering scientists on their own territory, and he fully admits that "the whole cosmological domain" *is* their territory. He would have no sympathy with efforts, like those of Dr. Wallace and Lord Kelvin, to restrict the ambition of the mechanical theory, or to try to wrest some shred of evidence for theism out of the teaching of science. We shall see that he falls away from his ideal here and there, but in his deliberate mood he fully accepts the conclusion that, on scientific and philosophic evidence, "the whole world"—in the words of Huxley—"living and non-living, is the result of the mutual interaction, according to definite laws, of the powers possessed by the molecules of which the primitive nebulosity was composed." I have, in fact, freely drawn upon Mr. Mallock's excellent book for support in the vindication of Professor Haeckel. He takes the *Riddle of the Universe* as the finest summary of the scientific hostility to religion. He accepts Haeckel's statement that the three essential propositions in religion are the belief in a personal God, the liberty of the will, and the immortality of the soul; and he assures Haeckel's critics, often in more vigorous language than Haeckel presumes to use, that their arguments are utterly fruitless and their positions untenable. After devoting eight chapters to the struggle over these doctrines, he concludes (p. 217): "The entire intellectual scheme of religion—the doctrines of immortality, of freedom, and a God who is, in his relation to ourselves, separable from this [cosmic] process—is not only a system which is unsupported by any single scientific fact, but is also a system for which, amongst the facts of science, it is utterly impossible for the intellect to find a place." Yet Mr. Mallock has announced that he is going to prove that these fundamental doctrines of religion are "worthy of a reasonable man's acceptance." How will he accomplish this?

In the first place he does not intend to evade the difficulties by an appeal to the "religious feelings" or "religious instinct"—at all events, not primarily; he is going to appeal to us "as perfectly reasonable beings." He quite realises that the growing habit of taking refuge in the emotions is little more sensible than the fabled practice of the ostrich. He devotes three chapters to a closely reasoned plea for the retention of the doctrines, as to which he has so far cordially endorsed Haeckel's arguments. Before entering on a careful analysis of his reasoning I will state his argument as concisely as is compatible with justice to it. These beliefs are to be retained on the ground of their moral and spiritual value to humanity. They are the chief source of all higher aspiration and effort, and are essential for the maintenance of our mental, moral, and social progress. So far the argument is more familiar than Mr. Mallock imagines. The peculiarity of his position is that he says they may be true, although they are flatly and most properly contradicted by science. And he justifies this by attempting to show that our accepted doctrines, even in science, freely contradict each other, and that such contradiction is not at all an indication of falsity. We may, and must, accept all that Haeckel says, and then add to it all that Dr. Horton says, without his "worthless and hopeless arguments."

In an age of scepticism like ours such peculiar evasions of the advancing criticism are not infrequent. Mr. Balfour's famous attempt to show the rest of the world an escape from Agnosticism is still fresh in the memory, though already too antiquated to detain us. The later thoughts of G. J. Romanes we will consider presently, as they are much quoted in opposition to Haeckel. Other singular attempts at pacification, of a less distinguished order, are met almost monthly. There is somehow a conviction abroad that Agnostics are languishing for some rehabilitation of their old beliefs, or that humanity at large—always excluding the peace-makers themselves—cannot maintain its advance without religious belief. Hence arises the singular spectacle of sceptical writers constructing elaborate defences of the conventional beliefs, which they do not share. The reception of Mr. Mallock's book hardly suggests the belief that his olive-branch will be respected by either group of combatants; but its ability and interest, and its indication of a possible ground for religion when all we have advanced has been fully established, compel us to examine it with respect.

Mr. Mallock begins with his proof that all our knowledge ends in contradictions when we analyse it, so that we may reconcile ourselves to Haeckel's disproofs. He first shows this in the teaching of theology, where, as he observes, the Monist will cordially agree with him. But he goes on to say that Haeckel's "substance" is no less contradictory, yet we accept it. The elementary substance (ether or prothyl) either consists of minute separate particles, or it is continuous. If ether consists of disjointed atoms, separated by empty spaces, all action must be an "action at a distance," which science rejects as absurd and impossible. If ether is continuous, yet the atoms of ponderable matter arise from it by condensation, then we are postulating condensation and rarefaction in a substance which has no particles to be pushed closer together or thrust wider asunder. But the elementary substance must be either one or the other, so that in either case we accept a contradictory proposition. Further, when we say that the nebula with its varied elements was evolved out of a homogeneous ether by a rigidly determined process, we are at once saying the ether was simple and homogeneous, yet was of so specific a structure as to grow into an elaborately varied cosmos. Again, we say time is infinite, yet an addition is made to it every moment; and we say space is infinite, yet it is divisible, and each part must be infinite (and so equal to the whole), or else we make up infinity from a finite number of finite quantities. Thus our scientific doctrines hold innumerable contradictions. Therefore, the contradiction between religious and scientific teaching need not deter us from accepting both.

Now, in the first of these illustrations Mr. Mallock has devised a fictitious contradiction; in the second he is following the vulgar fashion of building an argument on the imperfect condition of scientific knowledge; and in the third he is giving us some familiar metaphysical quibbling. Dr. Haeckel inserted in his work the theory of ether which was in favour amongst physicists at the time he wrote. Physics is changing yearly as to such theories; all is as yet tentative and provisional. But this is certain; physicists will never adopt any theory of matter that is self-contradictory. If the pyknotic theory, or the vortex-theory, or the strain-theory, of the atom reveals any such contradiction, it has no chance of acceptance. It is thus quite false to say we here complacently accept contradictories. It is, moreover, clear that Mr. Mallock's dilemma is "lame in one horn," at least. It supposes that these discrete particles are at rest. Science on the contrary supposes them to be eternally in motion, so that the empty space only facilitates their impact and mutual interaction. In the second case,

Mr. Mallock is, as I said, merely drawing our attention to the acknowledged fact that we have as yet nothing more than vague conjectures about the origin of atoms; but we embrace no contradiction whatever, and no theory will be received that contains such. The prothyl is conceived by scientists (apart from philosophers) to be just as simple and homogeneous as the scientific evidence will allow it to be. There is no disposition whatever to credit it with contradictory attributes. In the third case, Mr. Mallock is serving up to us metaphysical arguments for theism from those very theologians whose methods he has so severely denounced. Almost any recent Catholic apologist gives these subtleties of word-play. The contradiction is fictitious. When we say that, as far as the astronomic evidence goes, the universe is unlimited, we do not expose ourselves to this metaphysical antithesis of finite and infinite. Both as to space and time (in the concrete) the argument makes us say far more than we do.

Mr. Mallock thus entirely fails to show that we accept contradictory propositions as true. On the contrary, in scientific procedure the emergence of a contradiction is at once greeted as an indication of falseness, and is forthwith acted upon by the rejection of one of the contradictory theses. The groundwork and most essential and novel part of his structure of reasoning is invalid. He proceeds, however, to show (ch. xii) that science is not the only source, or the only test, of our convictions. There are as good grounds for accepting these particular contradictions as for admitting those of science.

It is at once apparent that we have in fact a large number of convictions which it is not the function of science to establish or examine. Our comparative judgment of conduct, of beauty, of spiritual values generally, is not tested by standards that the scientific reason sets up. Our belief in "the sanctity of human life" does not rest on scientific grounds; and the *influence* of religious ideas—the *truth* of which science criticises—is also a subject for non-scientific judgment. We might, indeed, complain at once that Mr. Mallock has here completely lost his accustomed lucidity. If he means by "science" the disciplines which to-day bear that name, it is true that many of our judgments lie outside them. But what will lie outside the range of the science of to-morrow it would be difficult to say. The science of æsthetics and the science of ethics are obviously creeping over much of that territory which Mr. Mallock holds to be extra-scientific. As a matter of fact the very question he is leading us to—the question of the mental and moral influence of religious ideas—is mainly a question for ethics and sociology to determine by objective and scientific standards. If Mr. Mallock means that the ethical standard is not scientifically determinable, he is begging an important question. However, let us hasten to examine the vital part of his eleventh chapter.

He says that it "has never occurred to Haeckel" to ask himself whether the ethic of Christianity, which he accepts, may not chance to be inseparable from its dogmas. In face of the nineteenth chapter of the *Riddle* this is a hard saying. Haeckel cuts away most of the ethic which is at all peculiar to Christianity, and finds that the valuable remainder is a purely humanitarian ethic. We have already seen this. But Mr. Mallock is thinking of that great problem of his whole career—the problem of free will or determinism—and he holds emphatically that on Haeckel's principles morality is absolutely impossible. Suppose, he says, that we in theory set up a world with a general belief in the determinism of the will. From such a world all moral condemnation and all moral appreciation must disappear; in it vice and virtue are indistinguishable; men and women are no more responsible for

their characteristics than the apple is for its colour or shape. Now one of the most effective parts of Mr. Mallock's book is that in which he shows that scientific determinism is absolutely irresistible. The contradiction he would ask us to accept is therefore the sharpest conceivable. He asks us to accept this contradiction—this irrefutable proof that the will is not free and this equally irrefutable proof that it must be free—on account of the moral importance of the belief in freedom. On the same ground we are to admit the beliefs in God and immortality which the scientific evidence has wholly disproved; the effect of our rejecting them would be "a shrinkage in the importance, interest, and significance which we are able to attribute to human life in general, and to the part played in it by ourselves in particular; and with the growth of scientific knowledge, and the habit of completely assimilating it, the shrinkage would become more marked, and its moral results more desolating." Hence, since we are prepared in other cases to swallow contradictories, we must yield to these grave reasons and embrace the contradictory theses of science and religion.

The second fallacy in Mr. Mallock's procedure seems to be worse than the first. Let us grant, for argument's sake, that these religious beliefs had all the efficacy Mr. Mallock claims for them whilst they were uncontradicted by science and philosophy, were sincerely and serenely held, and were thought to be based on tangible cosmic evidence. It is surely a monstrous fallacy to suppose they will retain that power when their position is so seriously changed; when men are assured that, in Mr. Mallock's own words, "it is utterly impossible for the intellect to find a place for them amongst the facts of science." We are, in fact, invited to regard these beliefs as efficacious because they are really held, and then to hold them because they are efficacious. To say that these considerations—if they are correct—should dissuade us from promulgating or defending Haeckel's views is an arguable, though a mistaken, position. But Mr. Mallock has just concluded one of the most vigorous and skilful attacks on the evidence for these doctrines that has appeared of late years. Does he imagine that people who read that attack will be disposed to cling to these beliefs because it would be morally beneficial to hold them? that people are so simple as to accept moral efficacy as the guarantee of the truth of doctrines which can only be morally efficacious when they are believed to be true? It reminds one of the American critic who said that J. S. Mill negotiated a certain difficulty by getting under himself and carrying himself across. Surely the simplest and the only possible procedure is to fasten on this very importance of moral idealism as a humanitarian gospel, and to show the world that it will taste a very real hell, here on earth, if it allows moral culture to be swept away along with the cosmic speculations with which it has so long been associated. The difficulty about the freedom of the will may turn out to be largely due to our slavery to language. That which formerly went by the name of freedom is disproved by science. But the fact remains—and it is a *scientific*, a psychological, fact—that we are conscious of being able to influence our character and our actions, and so we cannot deny our responsibility within limits. It is for ethics and psychology to determine those limits and to re-adjust our terms and conceptions.

I have only granted for the sake of the argument that these doctrines have all that moral importance which Mr. Mallock claims for them. He says this is clear from the attempts of Agnostic thinkers to find a substitute for them. Their ethical reasoning is irreproachable, but they recognise that they must also make "an appeal to the moral and spiritual imagination of the individual." Prof. Huxley does this with a plea for

"reverence and love for the ethical ideal," and Mr. Spencer urges reverence for the Unknowable and recognition of our unity with it. Mr. Mallock is very scornful about both, and he may be right that reverence of this cosmic order will pass away with the passing of theology. Haeckel has not appealed to such reverence, so that he may contemplate its disappearance without undue concern. He has urged us to find the practical ground for moral culture in the future in the recognition of its value to humanity. No one recognises this value more clearly than Mr. Mallock. It is the chief support of his whole argument. The loss of the higher aspiration would, he says, spell ruin to a nation, and the "belief in human nature is as essential to civilisation as is a good circulation to the healthy body." Now, if all this is true, as it is, it seems perfectly obvious that, when men have got over the confusion and reaction caused by the decay of ethical theology, they will turn to moral culture for its own sake. It is inconceivable how a subtle thinker, who believes men are capable of continuing to worship God and dream of immortality because it is useful to do so, though contradicted by the most solid evidence, cannot see the possibility of setting up moral culture on a sociological base. Confucians have done it for ages, and with quite as great success, to say the least, as Christianity. The bulk of cultured people, like Mr. Mallock, have done so for several generations.

Theoretically, we should expect that the transition from a divine to a humanitarian ethic will be attended with a certain amount of moral disorder. But as a fact, the change is taking place without any such disorder. The working class, which is irreligious to the extent of nine-tenths to-day, is no worse than it was a century or five centuries ago; it is, in fact, far nearer to "a belief in human nature." The middle-class, still largely religious, is hardly likely to deteriorate. The educated class—to ignore the money-line—is almost wholly without those beliefs in a personal God and personal immortality which Mr. Mallock thinks essential, yet will compare very favourably with its class in almost any former age. In a word, if we consult the facts of life instead of theory, we find no ground for supposing that moral culture—not to speak of intellectual, artistic, and social aspiration—is bound up with certain "cosmic speculations." Underneath all the transcendental imagery with which the Churches have clothed morality, there has always been an instinctive feeling that it was a very human affair, and this feeling asserts itself as the theological imagery passes away. There will be changes, of course. The proud intolerance and arrogance of the old moralists, with the horrible persecutions they inspired, have gone for ever; the ascetic contempt of "the flesh" is going and must wholly disappear; humility and meekness have no sociological value; virginity is a matter of taste, but marriage is a more virtuous condition; the stress on chastity (in a transcendental sense) has led to an appalling amount of real immorality in every age, because few were prepared to respect it; the old classification of virtues and vices, as so many rigid moral boxes to put other people's conduct in, must go; the old antithesis of selfishness and altruism will be replaced by an organic conception of man's relation to his fellows; the relation of the sexes will be subject only to a purely rational ethic, grounded on justice, not sentiment, and so there may be at length some hope of putting an end to hypocrisy and vice. When writers like Mr. Wells, or Mr. G. B. Shaw, or Mr. Karl Pearson, talk of the disappearance of ethics, they are thinking of one or other of these changes. But ethics will only gain by such changes. "Many are called, but few are chosen," said the founder of Christianity. It was a profound anticipation of the influence of Christian morality throughout the ages. Apart from certain special periods, apart from the relatively small areas that could be reached by a St. Bernard or a

St. Francis, Christian morality has been a stupendous failure. It was too transcendental, too false to the natural moral sense of the ordinary individual, to be otherwise. The cultivation of a kindly and humane disposition, of a sense of justice and honour, of tolerance and broad-mindedness, of concern for health of body and mind, of temperance and self-control, of honesty and truthfulness, is what humanity really needs; and all this it can and will have for its own inherent worth.

Thus Mr. Mallock has failed to prove that we anywhere complacently accept contradictions in our beliefs; and that, even if we did (to the utter confusion of any notion of truth), there is any special reason for retaining these theological doctrines; or that, if we did retain them in the teeth of scientific teaching to the contrary, they would be of the slightest value. There are, however, one or two confirmatory thoughts in his last chapter which we may still consider. It follows, he says, that our judgment deals with two worlds, the cosmic and the moral, the world of objective facts and the world of subjective values. One is the world of science, the other is reached by some other faculty of mind. It would be equally absurd to question the validity of our judgment as to either. In fact, there is, in the long run, a similarity in the ground of judgment in both cases. It is a mistake to suppose that in the scientific world everything is "proved." The fundamental belief, the conviction that there is a material world at all, is quite unprovable. If it is an inference from our sensations, reason refuses to ratify it. It is the outcome of "an original instinct"; and it is just such an instinct that is at the root of our judgment of moral values. Science must study the objective world; "analytic reason and a study of human character" must investigate the moral world. They find these three beliefs essential to progress, and their decision is as valid as that of science in its own sphere. The contradiction between the two need not trouble us. The mind is limited, and can "grasp the existence of nothing in its totality." "We must learn, in short," is his closing sentence, "that the fact of our adoption of a creed which involves an assent to contradictories is not a sign that our creed is useless or absurd, but that the ultimate nature of things is for our minds inscrutable."

This reasoning is only a new formulation of the argument of his preceding chapters, but one or two points call for notice. In the first place, it is perfectly true that all our convictions are not capable of "proof," because they cannot all be inferences. Our knowledge must ultimately be grounded on facts which are directly intued. These are gathered into general laws and principles, and from these inferences are drawn. And it is true that our perception of the external world is—in its rudiments—intuitive. It is not an inference from our states of consciousness; it would not be valid if it were. When metaphysics has grown tired of the current idealism, it will probably tell us more about this intuition. But Mr. Mallock's attempt to set up a number of little oracles in the mind in the shape of "primitive instincts" must be carefully watched. Further, what he calls the subjective or moral world is by no means wholly subjective. It is useful for his purpose to lead us on from æsthetic judgments to moral. We may, fortunately, leave out of consideration the difficulty of our æsthetic judgments, because our moral judgment is purely objective. The effects which Mr. Mallock anticipates from a Monistic ethic are emphatically objective; and so are the effects he claims for the Christian ethic. The determination of those effects, and so of the relative value of the two systems, is a study in objective reality. "The sanctity of human life" has nothing to do with it. The "belief in human nature" is a conviction that, of the various phases of life which humanity has experienced—virtue and vice, strength and enervation, social

order and anarchy, mental culture and sensual dissipation—the former alternatives are the most conducive to peace and happiness, which we happen to desire. That conviction is, therefore, wholly based on an objective inquiry. Hence the antithesis of the subjective and objective worlds does not help Mr. Mallock. And in point of fact the sooner we apply scientific methods to his second world, to the determination of moral values, the better it will be for us.

Finally, there is in Mr. Mallock's closing observations an important confusion of ideas. That the mind is limited, that we can only focus it on successive spots in the great panorama of reality, is a familiar truth. It is further true that we may not be able to see the connection between our little areas of knowledge, as they are often separated by leagues of ignorance. In this passive sense we may say we are unable "to reconcile" them. But to admit two or more statements that are clearly contradictory is quite another matter. To do so in one single instance is to admit the most radical and irreparable scepticism. Even the Catholic Church has strongly denounced the principle that "a thing may be true in theology yet false in philosophy." If contradictories may be true, we cannot rely on a single affirmation of the mind. Some "primitive instinct" may yet find out that it is also false. We should discredit our knowledge in its very source. Mr. Mallock is likely to remain to the end a Peri at the gate of Eden. Theology is not more likely than science to give ear to such a proposal.

I have said that Mr. Mallock's theory in some respects recalls the later thoughts of Mr. Romanes, and as these are much quoted in correction of Haeckel's procedure we may glance at them in conclusion. In his later years Mr. Romanes, once a thorough Monist, jotted down some of his "thoughts on religion," and they were published after his death by Bishop Gore. This solitary "conversion" amongst the scientific men of the last century has naturally attracted some interest, but it is not usually properly understood. In the first place the works of both Mrs. Romanes and Bishop Gore repel the Rationalist inquirer by the offensive and insulting insinuation that character had anything to do with the matter. "Blessed are the pure in heart for they shall see God," they both constantly exclaim. The inference as to those who do not see God is obvious. In the second place, Mr. Romanes, though he died in the communion of the Anglican Church, seems to have reached a theology of a very slender character. His God is pantheistically immanent in nature. All causation, he suggests, may be Divine action, so that God melts into the forces of the universe. The distinction between the natural and supernatural he wholly rejects; and he thinks the determinism of the will, established by science, is consistent with the belief that all causation is an act of Divine will. And thirdly, without discussing the illness which overcast the later years of Mr. Romanes, these "thoughts on religion" contain some sorry sayings. "The nature of man without God is thoroughly miserable," he says, projecting his morbid condition on the world at large; and "there is a vacuum in the soul which nothing can fill but God." Again, "Unbelief is usually due to indolence, often to prejudice, and never a thing to be proud of." However, let us examine his position in itself.

It may be said in a word that he appeals to a religious instinct or intuition, which is independent of reason. "If there be a God, he must be a first principle—the first of all first principles—hence knowable by intuition and not by reason." Of the two temperaments—the scientific or rational and the "spiritual" or mystic—he says "there is nothing to choose between the two in point of trustworthiness. Indeed, if choice has to be made, the mystic might claim higher authority for his

direct intuitions." "No one can believe in God, or *a fortiori* in Christ, without a severe act of will." He shows how often belief is influenced by desire in politics and is by no means an outcome of reasoning, and adds: "This may be all deplorable enough in politics and in all other beliefs secular; but who shall say it is not exactly as it ought to be in the matter of belief religious?" And, speaking of "the continual sacrifices which Christianity entails," he says "the hardest of these sacrifices to an intelligent man is that of his own intellect."

We will not do Romanes the injustice of analysing in detail these sad reflections of a suffering and diseased condition. It is with reluctance that a Rationalist approaches the question at all, but it is forced on us. Just as I write, an American correspondent sends me a copy of the *Literary Digest* for September 26. It appears that Professor J. Orr, of the Glasgow Free Church College, has been telling the Americans that there is in England a strong current from scepticism to faith. He "claims to speak as an expert," and "has in his possession a list of some twenty-eight Secularist leaders in England and Scotland who have become Christians." The truthfulness of this assertion may be judged from the fact that he only gives three names—Joseph Barker, Thomas Cooper, and G. J. Romanes. The former two were, I learn, men who were associated with the Secularist activity years ago, but were of no intellectual standing and are hardly to be termed "leaders." Romanes, he says, "bit by bit came under the power of the gospel, and died a Christian in full communion with the Church of England, avowing the faith of Jesus, his deity and his atonement, and the resurrection of the dead, and every other great article of our faith."[1] We are thus forced to set in its true light the death-bed communion of Romanes. As he says, it was by the sacrifice of his intellect, by ignoring his scientific temperament, by an effort of will, that he succeeded in assenting to what he calls "pure Agnosticism."

In a sense, however, his idea of a "religious intuition" is widely accepted in the decaying Churches. Many dispense themselves on the ground of this intuition or instinct from examining the criticisms that are urged. We need only make two observations on this last resort of the theist. Firstly, this "intuition" has, in the course of the last few thousand years, given men the most contradictory messages, and it is to-day supporting a hundred divergent beliefs about God and the future life. Its own vagaries sternly condemn it as a channel of truth. Secondly, modern psychologists agree to regard instinct as an inherited tendency or disposition.[1] It follows that if we have an "original instinct" impelling us to accept religious doctrines—I say *if*, because I am conscious of no such instinct, nor is any other person of whom I have inquired—this is only the disposition towards them which we have inherited, and has nothing whatever to do with their truth or untruth. It means, at the most, that our fathers have accepted these beliefs for many generations. We were aware of that already.

[1] To finish with this miserable effusion—quoted by the *Digest* from *Zion's Herald*—I must add that he then goes on to speak of Germany, where Haeckel's *Riddle* "has been discarded for fully a quarter of a century" (the first edition appeared a very few years ago). Professor Orr says that "nearly all the great scientific authorities that Haeckel quotes changed their views some thirty or forty or twenty-five years ago." He will give "the names of one or two of them," and out come the inevitable Virchow, Wundt, and Du Bois-Reymond. The last-named "has reaffirmed the soul of man, reaffirmed the spiritual principle in man, and reaffirmed the supernatural element in man"—compare what Haeckel *does* say of this Agnostic writer on p. 6 of the *Riddle*. If these things are not untruths, one wonders what is. One thinks of poor Romanes's awful statement that "this may be all deplorable enough in politics, but who shall say it is not exactly as it ought to be in religion?"

[1] See Villa's *Contemporary Psychology*, p. 292; Sully's *Human Mind*, I, 137; and Lloyd Morgan, Wundt, Ribot, and Masci.

CHAPTER XIII

CONCLUSION

WE find, then, that the recent efforts to evade the onward march of Monistic science do not promise any great measure of success. Neither the speculations of Dr. Wallace, nor the assurances of Lord Kelvin, nor the suggestions of Mr. Mallock, provide a safe path of retreat, if the positions of our earlier chapters have been established. As long as scientists were willing to remain silent on these cosmic speculations, it was possible for ecclesiastical writers to assume that they were not hostile, even to assume that they were friendly, and so to represent Professor Haeckel as a Quixotic and isolated defender of an extreme position which mature science had deserted. It is certainly not possible to do so with any regard for accuracy to-day. I have throughout supported his positions with the most recent utterances of scientific leaders, and the excursions of Dr. Wallace and Lord Kelvin have only served to show how far science is to-day from lending support to theology.

It may not be without interest, in concluding, to resume my work from the point of view and in the order which one finds in the *Riddle* itself. Chaps. II. to V. are devoted to the proof that man is descended, as regards his bodily frame, from some earlier animal species. This position is not now challenged by a single anthropologist of the first or second rank, and it is almost universally admitted by cultivated theologians. Chaps. VI. to X. are occupied with the proof that the mind of man has been developed from the mind of an animal of an earlier species. Dr. A. R. Wallace is almost the only anthropologist (if we may describe him as such) of high rank who still questions that this fact has been established, and we have seen that theologians acquainted with the facts began twenty years ago to acquiesce in this truth. The majority of the scientifically cultured apologists of our day admit it. We have noticed the overwhelming mass of evidence in favour of it, and the fact that the most recent researches of anthropologists tend to elucidate it more and more. We have seen that so critical a theist as Professor J. Ward speaks of the doctrine of the evolution of man, mind and body, being "accepted with unanimity by biologists of every school." When, however, Haeckel goes on (Chap. X.) to conclude, in the purely scientific spirit, that mind-force is therefore only an upward and more elaborate extension of the world-force that gradually advances from the inorganic to the organic universe, we find him denounced as "crude" and "unscientific." We have seen how wholly logical and scientific his procedure is. When, further, he goes on to say that this explanation of the origin of the human soul leaves no room for those claims of unique prerogatives on which man once based his hope of immortality, we again find the advanced company of apologists at variance. Some think the question is "insoluble by philosophy"; others elaborate novel speculations about the aim of the cosmic process which we have patiently considered. The very latest scientific researches, we saw, do no tend to ascribe any peculiar significance to human life or to the planet we inhabit.

Thus, in the first half of the book, which deals with man, we find that all Haeckel's scientific assertions are supported, almost without exception, by his colleagues in the anthropological sciences,

and are admitted by most of the apologists. His conclusions from these facts, touching the nature and the destiny of the soul, are not denied by his colleagues (who do not now, as a rule, trouble themselves about the relation of their knowledge to religious belief), but are contested in the name of religion by the theologians. They appeal to philosophy, and by philosophy we have judged them.

The second half of the work deals with a number of problems. Chaps. XII. to XV. are occupied with the nature of the cosmic substance, its unity, and its evolution, through the inorganic world, to the forms of living organisms. On the nature of matter and force Haeckel correctly gives the theories of the time he wrote, and his system readily assimilates any modification of these which the advance of physics may entail. The unity he claims for inorganic nature is undisputed, as is its evolution. When he proceeds to unify the inorganic and the organic worlds—to assume that life arose by evolution, and that the life-force is not of a specific or isolated character—he has all the leading biologists and most of the leading theists with him. We have seen what befel Lord Kelvin when he questioned this. He then (Chap. XV.) attacks the question of the existence of God. Here, save for a vague allusion to a "creative power" or a "directive principle" on the part of a few great scientists and the fuller theology of a small number of other well-known men of science, he again advances beyond his colleagues. Most of the scientists of our day (including those German scientists who are so much quoted) are Agnostics, and do not concern themselves about religion. Haeckel here speaks as a philosopher. He is confronted with certain metaphysical considerations which purport to prove the existence of God. We saw that for most of the cultured apologists this merely means a principle immanent in nature, and not distinguishable from it. In other words, the ultimate question is: Is the evolution of this Monistic universe of such a nature that we are compelled to suppose there was an intelligence guiding it from the outset? That is the problem on which all forces are concentrating. The defence of gaps is falling into disrepute, and, as a policy, is disdained by the very men who practise it. We saw that the forces which have evolved the world are not erratic in their action, and so needed no control; that science points to no beginning of the scheme of things, and so we need no creator; and that, on the other hand, the cosmic process shows many features which are inconsistent with the existence of a supreme designer and controller.

When Haeckel passes on to the moral sciences, we saw that he is substantially borne out by the latest research. Biblical criticism and comparative mythology have thoroughly shaken the belief in the miraculous life of Christ; and whether Haeckel has or has not the right version of his paternity is not an important matter. His judgment on the natural growth and the limited influence of Christianity is that of most historians. His theory of a humanitarian ethic is in harmony with the whole trend of ethical discussion to-day.

We have seen, on the other hand, how scattered and mutually conflicting are the critics of Haeckel's position. We have been able, during quite two-thirds of our course, to silence the majority of these critics with the weapons of the minority. The majority of those amongst them who have a wide scientific culture are warning their smaller-minded or less-informed colleagues to desert the defence of gaps. Almost the whole library of apologetics up to within the last ten years is useless to-day. The apologists of yesterday mistook gaps in scientific knowledge for gaps in the course of natural development. A few not very clear-minded theologians do so still; and the old instinct is so strong, and the fallacy appeals so strongly to the imagination, that we have found even the most advanced critics occasionally

falling from grace. The tendency is, however, to-day to allow that science may build up a complete mechanical interpretation of the universe and all its contents, the apologist is content to hope that he may enter at the close with his transcendental speculations on the supposed origin of the cosmic elements and the alleged purpose of the cosmic process We have seen that already cultured and sympathetic observers like Mr. Mallock are telling them that this last position will be no better than the first, and that science allows them no foothold whatever in the objective world.

That it is the ambition of science to give a mechanical explanation of the whole contents of the universe has been made clear. The dream of Tyndall and Huxley is by no means abandoned For the inorganic universe no one seriously doubts that this is only a question of time And the angry resentment by our leading biologists at Lord Kelvin's interference in their domain amply shows how little they are disposed to give up the ideal of a mechanical interpretation of life So far the vast majority of the leading scientists of the world are with Haeckel. I do not say that they endorse all his suggestions on points of detail. His system, we saw, is not a rigidly uniform structure, for all parts of which he claims equal weight. He throws out theories, and hypotheses, and suggestions, in advance of the demonstrated conclusions. These are temporary and provisional That scientists reject or dispute about any of these detailed suggestions—whether it be on the evolution of ether, or the first formation of protoplasm, or the fatherhood of Jesus—does not affect his main position, or his attitude towards religion He frankly says he may very well be wrong in these details, and that he merely suggests that the evidence so far seems to point in this or that direction. Whether the advance of science proves or disproves these suggestions does not affect the main issue. The main issue is the unity and evolution of nature. So far, as I said, scientists in general are with him When he goes on to deal with consciousness, creation, design, and religion, it cannot be said that they are with him But it is a gross deception to represent that they are with his opponents They are Agnostics, as a rule. They prefer not to concern themselves with these subjects. They are Monists in the sense that they accept the unity and evolution of the cosmos, and refuse to see any positive breach in the continuity of nature. But they are, as Dr. Ward says, "Agnostic Monists," in the sense that they are content with a negative attitude on these later problems. The number of great scientists who give a positive and explicit support to personal theism may be counted on one's fingers.

In conclusion, I would respectfully submit to these Agnostic men of science, and the vast cultured following they have in every educated country to-day, two considerations. The first is a request that they will reflect on the spirit and procedure of the apologists for conventional religion, as these are exhibited in the attack on Dr Haeckel, one of the most distinguished and most honourable of living scientists If he cares to invade every department of thought in search of anti-theological arguments, and to throw out scores of positive explanations in the teeth of the theologians, he must, of course, expect battle It is just what he desires But he desires honourable warfare. Truth is a frail spirit that must be sought with patient and calm investigation Its pursuit should be conducted with dignity and especially with a scrupulous honesty We have seen that, on the contrary, this campaign against Haeckel's views has been marked by malignant abuse and persistent misrepresentation, by statements which cannot be conceived as other than untruths, by gross perversion of the teaching of modern science, and by a score of devices and stratagems that would disgrace the conduct of a heated political campaign It is by these means that one-fourth of the people are held attached to the old

beliefs—people who, to a great extent, would carry into the new humanitarian religion a humane and proper spirit that would enormously facilitate the transition to a new inspiration. Is it conducive to the interest of truth, or of science, or of human welfare, that this corporation of the clergy should continue in the twentieth century that mistaken conceit about the truth of their cosmic views which inspires them with such dishonourable tactics?

Secondly, I would ask whether it is not too late in the history of the world to be inventing fanciful theories for the detention of the people in the Churches Three-fourths of the people are wholly beyond the influence of the clergy, and as these controversial devices become known the defection is bound to increase. It is too late to speak of the welfare of the race depending on a religion which the great majority have for ever abandoned Scepticism is in the atmosphere of the world to-day The more we educate the more we extend its influence If this is so the true humanitarian will desire the change to be effected as speedily as possible, and the moral ideal to be swiftly disentangled from its decaying frame of dogma. In one respect the world is in a pitiful plight to-day. Thousands of the clergy of all denominations are only too eager to disavow the old formulæ and to devote themselves to character-building alone. They are prevented by the lingering concern of the majority of church-members for dogma. They are forced to utter untruths ("symbolically") at the very moments when they are pleading for truth, and honour, and sincerity We have the spectacle of ecclesiastical scholars of all denominations being forced to disavow the convictions which have crept to their lips, and of Christian journals complaining that the lack of honesty is one of the most prominent features of theological literature How this state of things is held to be conducive to the social good it is hard to imagine

One of the great social needs of our time is to sweep away the whole tottering structure of conventional religion and worship Whilst we talk of "continuity" the world is deserting it altogether. The moral tone of the clergy is lowered by their corporate alliance with cosmic speculations The stream of enthusiasm which has so long flowed through the religions of the world is being dissipated Only one change will infuse new life into the Churches and rehabilitate religion—the swift abandonment to metaphysicians of all these cosmic speculations When that revolution has been completed we shall have given a new meaning to religion that will change the present contempt into concern It will be an affair of this world, a visibly important element of this life Men will turn their eyes from the clouds to discover new potencies in earth That is the sociological basis of the work of the Rationalist Press Association Behind it are scores of humanitarian constructive movements ready to guide and inform the religious or idealist ardour. Its work is the attack on unthinking superstition, the war against hypocritical professions, the promulgation of a standard of intellectual honesty, the cultivation of a virile and rational attitude on all the problems of life. It claims and deserves the support of every man or woman who is sanely and sincerely concerned for progress.

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