

## A BIOLOGIST'S RELIGION.

"All are but parts of one stupendous whole,  
Whose body Nature is, and God the soul."

WHEN I first read Darwin's *Origin of Species* it seemed too plausible to be true. Its conclusiveness appeared to shut out all future speculators from speculating in naturalism. Can it be, I asked myself, that this problem of creation, so perplexing for so many centuries, has been practically solved? Logically, in view of the intellectual assurance of previous generations, the solution, somehow, smacked of prematurity.

Subsequent developments justified the doubt. Investigation uncovered some glaring errors in previously plausible assumptions. What had passed as facts proved to have been purely fiction. The veil of speculation covering many natural phenomena was rent, exposing naked mechanisms whose design and capacities fitted no better to an evolutionary doctrine than to a vitalistic one. A complicated and marvelously correlated animated world revealed itself; each revelation becoming an obstacle to, instead of assisting, further speculation.

Vistas are opening up beyond the temporarily fascinating mechanistic reviews which make manifest their shortcomings. We see in them a kernel of truth surrounded by a mass of chaff.

A pragmatic enlargement of viewpoint suggests itself; a viewpoint which should include the possibilities of special

creation, combined with evolution. The present age cannot expect to monopolize the ultimate truth. History declares for the acceptance of a fundamentally mechanistic groundwork for all living things, functioning by grace of some "vitalistic" or external influence.

In other words, every new evidence points to the correctness of science's diagnosis in so far as it is confined to the mere fact of observed evolution or change of form, and as unmistakably indicates a limitation to these changes conditioned by circumstances as yet beyond our understanding. The traditional conception of creation has lost nothing through competition with the mechanistic hypothesis. Rather it has gained. For the mechanistic hypothesis has failed at just those points where failure counts for special creation.

There is special significance in the expressed need by experts in both biology and physics for another Darwin and another Newton to embody newly discovered facts in theories more consistent with observed phenomena than the several diverse hypotheses now tentatively offered.

Selection, under the first general survey of phenomena, had been made the key-note to evolution, but proved to be an inadequate solution. Here we had a wonderful plausible solution of the world riddle all cut out and dried, when facts cropped up to destroy our confidence. A set of investigators, dissatisfied with the offhand explanations of how evolution came about, determined to ascertain the truth for themselves. Unfortunately they discovered too much—for the fair name of evolution. After careful and prolonged examination of the conditions under which selection occurs, observers found that agency did not work out at all in nature as it had been worked out on paper. They tried many cases of selection and found them wanting. The cases investigated offered absolutely no foothold for such a progressive selection as had been pictured.

Nor were the radical evolutionists more happy in another important particular. They originally placed great confidence in the coincidence between phases through which the animal passes in development (as from egg to maturity its form in embryo suggests the fish, bird, etc.), between these phases and the present geographical distribution from old-world primitive types to new-world more complex ones.

Thus it is the eye can pass in review the respective stages through which the primitive animal supposedly gained its monkey-like complexity both by observation of the course of development of higher animals, and by placing the existing animals of the world in a corresponding scale.

The fact that the embryonic form of the highest vertebrate recalls in its earlier stages the first representatives of its type in geological times and its lowest representatives at the present day, speaks only of an ideal relation, existing, not in the things themselves, but in the designing mind. While these transient resemblances of the young among higher animals in one type to the adult condition of the lower animals in the same type, suggest physical continuity, each one of the primary divisions of the animal kingdom is bound to its own form of development, which is absolutely distinct from all others. No type of animal diverges in the slightest degree from its own structural character. The lower animals are never seen to rise a shade beyond the level which is permanent for the group to which it belongs. The higher ones are never seen to stop short of their final aim, either in the mode or the extent of their transformation.

The hopes of the mechanist to read the book of life from the embryonic development of higher animals seems to have come to naught. Wherever practical tests are available the evidence indicates at least its minor inapplicability. Among others Tower found that his modified beetles repre-

sented a process of synthesis rather than of accumulation. The modified beetles skipped stages represented by transitions in their ancestors, and altogether physiologically behaved in a manner to suggest the futility of determining relationship and directions of evolution through life histories of species. This plausible recapitulation theory, so important in the earlier phases of evolutionary doctrine, thus lost much of its importance as a measurer of biological movements.

The mechanistic interpretation carries its own penalty. A study of growth and form undertaken with a view to substantiate the mechanistic claims reveals the fact that in simpler organisms, "whose form is due to the direct action of a particular physical force, similarity of form is not necessarily an indication of phylogenetic relationship."

The appeal of biological formula-making is well nigh irresistible. It is so tempting to reduce biological movements to a definite and precise rule consistent with our conception of its activities. The "Age and Area" formula is a case in point. All the more interesting because it brings into consideration the still disputed flora and fauna of New Zealand. The "Age and Area" formula applied to plants presupposes the area occupied by any given species depends upon the age of that species in that country. The older the species the wider its range. Perfectly simple and effective—if true. The problem, however, is a little more complex and less obvious than that. And the formula, which hinges on the distribution of the New Zealand flora, is found faulty in its fundamental assumption. A large and characteristic element of the New Zealand flora, it seems, entered the islands not from Australia on the west, as the author of *Age and Area* supposes, but from the Antarctic regions to the south.

The factors governing the distribution of animals are

even more complex than those effecting plants. Food supply, rainfall, humidity, wetness or dryness of soil, altitude, atmospheric density, safety of breeding-places, water (to land species), land (to water species), nature and availability of cover, light-intensity, temperature, inter-specific pressure, parasitism, and individual or racial preferences, are some of the factors responsible for the distribution of animals.

The mere catalogue of these influences dooms any simple analysis of their effects. The mechanisms of geographical distribution alone indicate a constant process of adjustment. Frontier individuals, those on the margin of the habitat of the species, may not prosper as readily or reproduce as prolifically, as those in the more favorable center regions of the species, but they certainly do not, as a rule, beat themselves to death individually against their limiting barrier, of whatever nature it may be.

The most important factor for one species is likely to be of minor importance for another species. Always a combination of factors is accountable. Then, too, there are indications of influences at work other than strictly physical ones. Side by side with facts, apparently the direct result of physical laws, are other facts, the nature of which points quite otherwise. The fauna of the Arctic and that of the Alps show a direct relation between climatic conditions and animal life. Yet even there where the shades of specific difference between many animals and plants of the same class are so slight as to elude the keenest, we have representative types among both plants and animals as distinct and peculiar as those of widely removed and strongly contrasted climatic conditions. Shall we attribute the similarities and differences alike to physical causes? On mountain heights of equal altitudes, where not only climate, but other physical conditions would suggest a re-

currence of identical animals we do not find the same, but representative types.

It is now admitted that even among unicellular organisms, specific stability is of much wider application than the first loose judgments—under the spell of the evolutionary logic—had persuaded us was the case.

Recognizing the inadequacy of physical explanations, the mechanists by force of their experiments, have switched from these tangible, external influences to internal, intangible ones. They have not quite decided yet whether these internal influences manifest themselves in the form of mutations—large steps, or selection—small steps.

A warm controversy is at present waging between these two schools. The fact that there is a controversy indicates that scientists are still in the dark, still out of harmony with evolutionary causes; and this lack of harmony is characteristic of humanity in its attacks upon all the problems of life. To expect too much of partially applicable principles, to push too far, perfectly legitimate, but limited, formulas is a fatal fault. Evolution has every earmark of being true—up to a certain extent. Scientists can never hope to approximate this extent so long as they are determined not to limit it.

Though the heart can be made to function temporarily outside the organism, this complaisance entails no wholesale organic obligation to the mechanistic dogma with its limitless vistas of restless molecules and chemical affinities. It shadows forth the inevitable precision of the incidental as distinguished from the particular. Respiration and circulation owe their machine-like precision to a conscious inspiration, whose remoteness is a guarantee of individuality. In the cosmic sense respiration is just as consciously performed as though oxygen were hand-pumped into the blood-stream; only the consciousness is mercifully and tactfully activated from a distance. Imagine the labor and

concentration necessary for a person to remember breathing and pumping his blood at regular intervals! The very indefiniteness of the manner of approach of this distant consciousness, and the vagueness as to its point of contact, intrigue us into denying its reality.

The accurate and regular working of the mechanical parts argues a designer more eloquently than tons of logic. The further the investigator goes into the details of the marvels of life processes the further he gets from proving these marvels take issue in the chance arrangement of simple chemicals.

Reviewing Dr. J. P. Lotsy's recent extreme advocacy of mechanistic doctrine, Professor Jeffrey remarks, "It would apparently be well for the mechanistic biologists, who swarm at the present time, to admit also their indebtedness to the oldest if not the least dogmatic of the sciences, theology. If they had the grace to do so, their debt would doubtless be to Bishop Butler's famous *Analogy of Religion*. Lotsy's comparison of hybrids with metal ores is on all fours with the well-known Butlerian argument that the human worm will enjoy a future winged state because the lowly caterpillar later becomes the resplendent butterfly. Analogies are interesting but they do not constitute scientific argument, however much they may appeal to the socialistic and half-educated mind. Much of the present-day mechanism has a foundation not more substantial than the resemblance between a butterfly and an angel."

Once embarked in the business of making comparisons to substantiate their hypothesis, the imagination will carry far. Not far enough, however, to overcome the facts uncovered by investigation. Here there is another story to tell.

It is difficult to believe that the known world is merely a huge dice-box from which a capricious fate shakes out

an occasional fortunate combination of materials in the shape of an oyster or an elephant.

Morgan's wonderfully intricate and detailed work analyzing the movement of factors which decide the make-up of the fruit-fly, *Drosophila*, has given a valuable insight into the mechanism of heredity. It portrays the distribution, through mating, of already existent factors; but it gives us no inkling whatsoever of the creative agency making these factors possible. It increases rather than diminishes, the mystery of creation, by showing how characters move from the fertilized egg to the mature organism with marvelous regularity, yet fails to enlighten as to the designer back of their regularity.

Numerous experiments are in progress to test out various mechanistic phases of life processes. These experiments usually culminate in the same conclusion. The mechanical processes are mechanical. In experiments carried on by other investigators to discover causes which regulate the duration of life in *Drosophila*, it was found that the termination of the first stage of metamorphosis is determined by the production in the body of certain chemical constituents not before present. Further investigation by temperature-rises decreased the length of life of these flies. Hence it seems probable that longevity is determined by chemical reaction. Then we come to the endless chain which leaves the chemical reaction in mid-air, minus a known cause. Male insects of some species die immediately after mating; the female of some species die immediately after laying their eggs. Between the two are all grades of longevity with all sorts of chemical reactions, inspired by causes equally unknown.

The imperfections in the mechanistic logic are matched by imperfections in the geological record. These imperfections are glossed over by popular paleontologists. Paleontologists are imaginative students, who are more im-



pressed by the dry bones of the past than by the living facts of the present. While they are usually cautious to confine their claims of actual cases of evolution to relatively brief geological periods, the popular scientist does not scruple to extend the scope through all geological history. That is why the popular conception of prehistoric man has to be revised every so often to keep in line with the discovery of each newly dug-up prehistoric skull.

Calculations based on comparatively short periods in the world's history fail to enlighten as to origins. We cannot hope to approach very close to the truth if we are content to judge the whole from a small part. The Tertiary age presents but a fraction of the world's geological history. Beyond stretch centuries of great biological activity, of whose trend and products we are now afforded only occasional fossiliferous glimpses.

The moral for snap judgments in the matter is furnished by the findings of the seven blind men of Hindustan who went out to investigate the nature of an elephant; one of whom came in contact with the tail and declared the elephant to be like a rope, another bumped into the leg and was convinced of the elephant's likeness to a tree, and so on.

Sudden physical changes in the earth's surface, at widely separated intervals, were accompanied by important alterations in the organic world. Marked and violent changes in the earth-crust caused new elevations, and at the same time terminated the existing animate creation, introducing new populations entirely different from the preceding one.

These cataclysms offer barriers to physical continuity which no amount of persuasive logic can overcome. Of course the fertile mind can conceive of ways of holding to the idea of progressive and continuous evolution as opposed

to special creation, even in the face of these cataclysms. But there are few real facts to substantiate their claims.

Prof. R. D. Carmichael is authority for the statement that "In the early years of the present century the world of scientific thought has been unexpectedly confronted with a new situation of a rather astonishing sort. Our unquestioning assumption of the continuity of nature appears not to have been well founded."

He demonstrates the likelihood of our being on the verge of interpreting everything in nature as discontinuous. Certainly the concrete evidence indicates the falsity of the continuity principle upon which complete evolution is founded. Students of science, even of the highest ranks, are apt, when drawing to conclusions, to fail to take proper account of altering rates of changes of temperature or pressure. Verified rates for short distances cannot safely be assumed to continue indefinitely without interruption or variation. Helmholtz, the distinguished physicist, limited the earth's atmosphere to twenty-eight kilometers from the surface on a basis of the gradient as then determined. Soundings carried to twice the limit fixed by Helmholtz reveal an interruption of the aero-thermic gradient and entirely upset his calculations of what should be.

Robert Mallet, with his centrum theory of earthquakes, dominated orthodox doctrine among earthquake specialists for full half a century; "and succeeded in keeping seismology out of its rightful field of geology for that period."

Ferrel's predicted whirls about the earth's geographical poles, were proven, by subsequent exploration, to be non-existent. "Yet so great has been the success of Ferrel's theory as a whole, that despite its contradiction of the facts, the polar calms and whirls are still treated in the latest text-books of meteorology."

On the other hand the continuity theory as applied to evolution in the cosmic sense has been shown also, by in-

vestigation, to have been erroneous. The polar researches of Captain Scott and Sir Ernest Shackleton make manifest the fact of a steady glacial retreat. "The bearing of this conclusion upon the ultimate development of the human race is so far-reaching in its consequences that the great sacrifice attendant upon the prosecution of these researches stands forever as a memorial in the correction of the erroneous and wide-spread conception that the earth is in a period of refrigeration, desiccation, and decay; and establishes the conclusion that it is in the springtime of a new climatic control during which the areas fitted for man's use are being extended and that the moss of polar wastes will be replaced by rye and wheat."

So that either way it is taken the fundamental conception of evolution can find no true basis either in physics or mathematics. The momentum of its original plausibility carried it along past the point where the facts patently discredit it.

We hear echoes of this passing of the critical period by such phrases as "The intellectual bankruptcy of the whole evolutionary theory in the late nineties." The strategic rescue of the evolutionary theory, and the covering of its defeat from public gaze was most unfortunate for humanity. It gave a false value to the doctrine, "Might makes Right," which many evolutionists are, after the event, in haste to disclaim. Particularly in Germany was the obsession carried over the critical period by the Wallingfordian persuasion of Haeckel. Germany, by a blind adherence and unlimited advocacy of a limited principle, worked itself into a conquering ecstasy which culminated in the war we are suffering—any one who doubts the connection between the mechanistic conception and the world war has but to read Haeckel and the "Kultur manifestoes" side by side—(see also Northcliffe, *Current Opinion*, Oct., 1917).

The mechanistic conception is a banal attempt to standardize our emotions; but one destined to failure because of the essential falsity of both its premises and conclusions. The philosophy of continuity is the outcome of a misguided hopefulness rather than the result of any positive and convincing inductions.

Deductions from any inadequate basis leave us deep in the mire of metaphysics. True science is never dogmatic and deductive; it is pragmatic and inductive. It is built up slowly from an accretion of tried facts, not suddenly as from the framing of brilliant generalizations. The Darwin theory of mimicry is a case in point. For many years established in the scientific mind by a series of then logical deductions, the whole theory of mimicry and adaptive coloration is now badly in need of revision. Dr. Longley's studies of tropical fishes, and others in similar fields, make clear that the criterion of fitness must derive its sanction from the studied animal's intimate enemies, not from man's conception of what the relation ought to be.

Having been pretty well fed up on the mutual obligations and mechanical fitness existing between bees and flowers, we are somewhat shocked at the introduction of a sordid, stubborn fact into the romance of this interesting relationship. It seems that in the haste of logic-making important considerations were carelessly overlooked—an ant appears in the ointment of perfect argument.

The theory of this scientific-romantic ordered relationship is that the flower, in response to the demand of the bee for nectar, developed the nectar-generating habit; while the bee, reciprocating in response to the demand of the flower for cross-fertilization, a perfecting of the system for insuring its best reproduction, developed features of assistance in carrying ripe pollen from the male organs of one flower to the female organs of another.

This might account for nectar in flowers, but how about

the extra-floral nectaries, nectar-sacs on leaf branches and in other discouragingly irregular places? Contrary to the earlier superficial expectation that such extra-floral nectaries might divert the attention of ants from the greater treasures of the flowers, it appears that plants having these sacs, sometimes have their flowers more robbed by ants than would probably be the case if they lacked extra-floral nectaries. On the other hand bees are like to visit these irregular sweets and neglect their duties to flowers. In such cases the flower may fail to be cross-pollinated, indicating a distinct disadvantage. So that, whatever way this romance in mechanistics is viewed, something must be sacrificed. Either we must sacrifice the fundamental principle upon which the extreme evolutionist insisted, that "no structure can survive unless it is of use," or we must sacrifice the picturesque reciprocity of the bee.

Having proceeded beyond the simplicity of the Darwinian formula, the up-to-date evolutionist willingly sacrifices the older, narrow view, which fastens a use to every character, to the newer attitude looking to haphazard internal influences. External tangible physical influences failing in their obligations, it was inevitable that internal, intangible influences should have a trial. But in this repudiation of an old love and taking on of a new no additional light is shed on the marvels of coordination. Quite the contrary. As we cut off environmental pressure from initiating variation we depart from the prospect of arriving at a tangible explanation of creation. Saddling responsibility for variation on the germ-plasm of the race submerges in deeper mystery those problems of relationship and cooperation which are manifestly the important ones.

The germ-plasm, ordinarily so inexorable, is now the accepted seat of all organic changes since the first primeval atom. To its idiosyncrasies we owe all beauty in form, expression, and fitness. It is the chemical experimenter

*par excellence*. Hydrogen and oxygen playfully throw aside their obstancies in its magic stream, depart from their strictly ordered existence, and enter into the carefree pastime of concocting complicated essential compounds whose composition cannot be duplicated by the centuries-learned brain of man.

The elusive quality of what we call life is illustrated by the failure of scientists to reproduce the living plasms synthetically though their constituents are known and assembled in proper quantities. What nature accomplishes accidentally, man, with all his accumulated knowledge and resources cannot accomplish at all. Through laborious and long-continued effort he can achieve the lifeless replica: the optical form, such as exists in nature, significantly evades his every effort. The validity of the mechanistic doctrine as an explanation of creation is seriously hampered by his inability to react the drama of his own making.

It is now scientifically admitted that we do not know what protoplasm is. "We have analyzed the substance chemically, we have carefully examined and tried (but without complete success) to describe its structure. We know it is more than merely a chemical compound. It is a historical substance. A watch as such is not." (Dr. C. S. Gager, *The Fundamentals of Botany*.)

There seems to be a fatal shortcoming somewhere in the offhand reasoning relegating the organism to the category of fortuitous chanceling carelessly drawn by the hand of fate from out the immensity of the cosmic reservoir.

That the unpremeditated experiments of a bit of protoplasm in chemical affinities would finally culminate after eons in a scampering monkey is difficult enough of belief; but that this same line of individual experimentation could accomplish all the wonderful collective fitness and coordination of star and sun, water and earth, tree and shrub,

insect and man, is more mythological than the mythiest myth, save for the order of mind which has long accustomed itself to spurn other than a mechanistic explanation however strained. There are, undoubtedly, certain orders of mind so firmly locked in the embrace of conventionality that they cannot break loose. For science, conventionality demands adherence to the mechanistic doctrine, and the conventional appetite is easily satisfied. Any formula composed according to its strict rules is acceptable. Thus we find it eagerly espousing the cause of a definite theory of the universe while the fundamental atom is still an enigma. From this easy habit of accepting piecemeal the mental product of recognized authorities we perceive an historic exhibition of favor and disfavor which does small credit to our decree of finality.

To Democritus and his disciples the world appeared to have been the result of a fortuitous concourse of atoms. Plato and his school declared for the orderly course of nature as due to a divine plan. Descartes advocated an earth formed by the aggregation of puny particles of matter which have an inherent whirling motion. Laplace further enlarged upon this view which was received for several generations without reservation. Serious defects later developed, however, and within the last few years astronomers and geologists perceived its coming discardment. The Planetesimal Theory of Chamberlain saves the remnant of Laplace's Nebular Hypothesis, by enlarging upon additional phenomena which required explaining. When these revising explanations—made necessary by hitherto unconsidered phenomena—become too cumbersome and complicated for further logical acceptance we may expect their total breakdown and a return to older views.

It is ever the way of humanity to deal in extremes. Pragmatism is the most difficult form of philosophy for it to adopt. No half-way measures are satisfactory. Either

truth must be presented concretely or they will have none of it. Either the mechanism is all or the spirit is all. The possibility of a mechanism divinely planned and ordered, a mechanism which is the highest expression of a designing influence, seems not to have occurred to any number of thinking men.

Yet it is just this possibility which keeps the theorist hovering from pole to pole to discover a principle whose real roots are at the equator.

The unit character conception—whereby the organism was supposed to be a compound or mosaic of characters each one definitely represented in the egg—was most attractive. Evidence of certain characters which do not follow the indicated biologic law, made its modification inevitable. Experimenters soon came to see, particularly in regard to color inheritance, that the matter is most complex. In numerous cases of color inheritance there is little to warrant the assumption that these phenomena are based upon representative particles or individualized entities, and very much to warrant the belief that they are the product of a modified chromogen base, a modified enzyme or rather vague capacity for carrying on the process.

All roads lead to Rome. From a simplicity of organization which the mechanistic doctrine demanded, there has gradually developed a recognition of complexity involving a "vitalistic" or external influence, a return to the Platonic viewpoint. Having run the gamut of creatorial guesses and pretty well exhausted the visible supply of possibilities, the theorist is likely ultimately to double back disappointedly to his starting-point. His intellectual pilgrimage has led into no thoroughfare. Obligated by the obvious shortcomings of his directing instruments to retrace his steps, what more sensible than that he should endeavor to stand once more on the threshold and take stock of the faults and realities of his philosophy? To ascertain the



limits of his intellect and to gage its value as opposed to more subtle and settled intuitions?

The crux of the whole matter is here: whether we feel safer in trusting to the pronouncements of biased observers, or in being guided by finer intuitions. Since the intellect is only equipped to grapple with the things of the intellect, we cannot rightly expect it to do justice to itself in matters entirely outside its domain. Those of simple faith, unhampered by intellectual trappings, unaffected by dictation of historically authorized formulas, are best fitted to appreciate a process having nothing in common with a restricted human intellect.

The untutored savage is less handicapped than the most erudite scholar, more thinly insulated from the simplicity of the creatorial influence. The eyes of the Indian and trapper can detect signs and tokens unseen by the educated white man; their ears can hear rumblings to which the latter is deaf; they have advantages of perceptions which the higher civilization dulls. Time has made it manifest that the intellect is a poor gage for the creatorial plan, primarily because the conscious mental processes are unable to cope with the intangible—the tangible alone is their province.

Nor are the intuitive activities confined to an appreciation of spiritual truths; they enter more largely into worldly affairs than intellectuals are inclined to admit. Mr. Harvey O'Higgins, who has made an extended and intimate study of subconscious activity, provides concrete evidence of the working of the subconscious in practical men like Judge Lindsey and Detective Burns (*Saturday Evening Post*, Oct., 1917). Granting, as we must, that such men have been actuated to their best efforts through the instrumentality of the subconscious we can no longer question its judgments. Then also we are obliged to place a higher value on the intuitive findings of a Fabre than on the purely

intellectual calculations of a Dr. Jacques Loeb or a Haeckel. "What is true of the subconscious mind in artists is almost equally evident in the achievements and careers of many men of great intellect outside the arts. In their biographies, again and again, you will find that the deep secret of their success, the real heart of their mystery, is a gift, an intuition, an instinct that cannot be explained—that is to say a subconscious faculty."

In proportion as men of intellect have been willing to submit to the still small voice of intuition are they successful in a dual world. For where there are two equally important processes in operation each must receive its due share of recognition. Spirit and flesh are the irreconcilable components of duality. The spirit speaks a language quite different and distinct from that of the flesh—no messages from one to the other are translatable. Denial of duality is the easiest way out, but it is a way which leads into endless philosophic sophistries having as their object the confusion of terms, and involves comparisons more pleasing to the imagination than complimentary to the understanding.

For those who see merit in the pragmatic attitude it is possible to differentiate between the strictly mechanistic doctrine and a modified evolution. It is not necessary for them to be either atheistic or egotistic. Limiting God's province carries neither conviction nor appeal. An orderly plan and a variable organism, if viewed from a sufficiently high plain, lose their apparent antagonism, and become merged in one stupendous harmonious whole. No biologist need now fear betraying a trust in admitting "vitalism" or design in the scheme of nature, because he is merely submitting to the dictates of a saner science.

The fact that increasing thousands of intelligent people are eagerly espousing the Christian Science doctrine of the unsubstantiality of matter looks hopeful. The fact also

registers the ordinary course of human reactions. From the extreme of an unsatisfactory materialism to a pure spiritism was an inevitable step. Yet it is clear that life, without matter, would be anchorless, chaotic; matter without life, a superfluous, taskless anchor.

Why should there be any difficulty about granting to Cæsar what belongs to Cæsar, and setting aside for Titania that which is rightfully hers? Only the disinclination of an enlightened people to forego a supposed advantage. Preferring to hasten from one pole of the truth to another, these uneasy persons never pause long enough at the equator to take exact observations. Either their practical minds will accept no compromise, or their idealism will permit no taint.

It is doubtless difficult for some orders of minds to keep separate their business and religious convictions. For the biologist the separation is particularly desirable. Research work is necessarily limited to mechanistic processes of life. But this is not equivalent to denying the existence of a "vitalistic" side. Among the unprejudiced initiated the existence of a ruling intelligence is becoming more and more an admitted possibility. With a further swing of the pendulum we can look forward to a freer, franker, less limited recognition of the power and goodness of God.

"Up from Earth's Centre through the Seventh Gate  
I rose, and on the Throne of Saturn sate,  
And many a Knot unravel'd by the Road;  
But not the Master-knot of Human Fate."

WALTER SONNEBERG.

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