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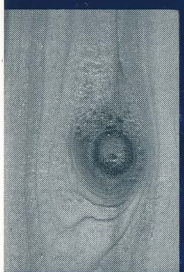
Faith and Thought

BULLETIN



FAITH and THOUGHT

Faith and Thought is the operating name of
The Victoria Institute or *Philosophical Society of Great Britain*
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Contents

Editorial

We hope that readers will find this year's lecture of interest, as it gives a differect view of Darwin's ideas, culled from his writings over many years. One must congratulate Professor Vere on his assiduous searching of the literature to open up this subject for us.

Then, a reminder that there is still time to send in essays for the latest competition (see *Faith and Thought*, April 2003, number 33). We have received several essays; more would be welcome!

The index is still being up-dated and this issue contains the first part of the period 1979-1983. This means that we will have covered 85% of the existence of the Victoria Institute, from 1867. It has been a mammoth task, and all credit is due to our tireless (?) typesetter who has accomplished the task so magnificently.

New Members

C.J. Kennington, M.A., C.Eng.	Henley on Thames
Duncan Vere, MD, FRCP, FFPM.	Buckhurst Hill, Essex
John Weaver, BSc, PhD, MA.	Cardiff
John A. S. Rokos, PhD, MSc.	Wood Green, London
Francis C. Parkinson, BA, MA, PhD.	Lytham St. Annes, Lancs.

Annual General Meeting : May 12 2003

The Chairman, Terence Mitchell, welcomed the speaker for this year, Dr. Duncan Vere, and proceeded to make some brief remarks concerning the present state of the Institute. Certainly we have subscribers, but if we could increase these in number, the finances of the Institute would improve.

As was mentioned last year, the Council, although aware of the honourable record of the name, *viz.* Victoria Institute, perhaps needs to think again about this title. The former name of the journal - *Journal of Transactions of the Victoria Institute* - brings to mind nineteenth century matters. Moreover, now that we have a web site, we want particularly to have the Institute known by a head name which would have relevance to anyone seeking for information on the matters we seek to cover. The Council has therefore decided to change the operating name to Faith and Thought, a phrase with which we have been associated already for some years. We feel that this is something that will be immediately indicative of our concern.

The minutes of the AGM for 2002 have been recorded in *Faith and Thought* Bulletin number 32, October 2002. There were no corrections suggested or questions arising from these.

Election of Officers and Council

(a) Nominated for election to further terms of office:

President:	Sir John Houghton, CBE, FRS.
Vice- Presidents:	Professor D.J. Wiseman
	Professor M.A. Jeeves
	Professor Sir Robert Boyd

(b) Nominated for election to the office of Vice-President:
Professor K. Kitchen
Professor A.R. Millard

(c) Council:
Honorary Treasurer: Rev. John D. Buxton

(d) Additional members of the Council:
Professor Duncan W. Vere
Rev. Dr. John Weaver

(e) The following members of the Council, who formally retire, have been nominated for re-election:
T.C. Mitchell
Dr. A.B. Robins
Rev. Dr. R.H. Allaway

No other nominations have been received.

All the above officers were elected *nem. con.*

The Chairman called upon Mr. Brian Weller, acting treasurer, to present the accounts, which are available upon application, and were approved by the meeting.

Activities in 2004

In 2004 we are planning a Saturday Symposium, probably in October, to be devoted to Biblical Archaeology. We hope that our two new Vice-Presidents, Professors Kitchen and Millard, will be able to take part, though they have not yet been in a position to confirm this. In addition, our Council Members Professor Colin Humphreys and Dr. John Kane will also contribute papers, respectively, on the period of the Exodus and on the New Testament period, and possibly, if the programme allows time, I will contribute a paper, provisionally on Iranian Loan-Words in the Old Testament. Members will receive full details in due course, and these will be made available on the Internet, and in the form of a hand bill.

The Chairman then introduced Professor Duncan Vere, speaker for the evening and briefly outlined his background.

Professor Vere, who is now in reitirement, was a general physician at the Royal London Hospital, where he was a clinical pharmacologist. He was Professor (now Emeritus) of therapeutics at London University.

His research was in the design of clinical trials, in palliative medicine and pain.

He was a UK Medicines Commissioner, and was Chairman of a local research ethics committee.

Since retirement he has made a particular study of the private papers of Charles Darwin, and his lecture this evening arises out of these investigations.

I will now ask him to speak on:

'Explanation' - What Did Darwin Mean?

Life in a determinist straight-jacket.

Duncan Vere

Charles Darwin stated many times that one of the most striking strengths of his theory that living things descend with modification by natural selection was that it gave an 'explanation' of wide ranges of observable facts. His written uses of the word are shown in Fig. 1. In what sense was he using 'explanation'? If this can be answered, does this throw any light on the nature of his scientific enquiry?

An explanation can have a trivial meaning; we can ask someone to explain their action. More properly, it means to set out the parts of a complex thing so that

it can be understood. But there is a third sense in which we use the word; this is an explanation which is confined to a restricted range of meaning. I believe that it was in this third sense that Darwin worked, and I aim to show evidence for this and to discuss its implication.

Darwin has sometimes been portrayed as being driven towards his theory by the steady growth of scientific discovery and to have reached the idea of natural selection when he read Malthus' account of population pressure by logarithmic growth[1]. He did indeed say that in October 1838 this was the key to his understanding the forces which drive natural selective competition[2]. But this referred in fact to his realising how selection could operate; the idea that this might be the process which he was seeking had clearly occurred to him long before 1838. What is the evidence for this?

Fig. 2 shows the dates of Darwin's notebooks[3,4,5,6,7] with the approximate times of the notes made in seven categories, together with some significant concurrent events which involved him.

First, there are notes which were critical of 'creation' as an explanation of the types and distributions of animals and plants, alive or fossilised, which he had seen during his voyage on the *Beagle*[8]. These are shown by cross symbols in Figure 2.

In March 1837, he wrote in his resumed *Red Notebook* (RN), "If one species altered ... yet new creation affected by Halo of neighbouring continent, as if any creation over certain area must have peculiar character." He was clearly thinking then of transmutation of species, of distribution of species in relation to geography and of the assumption so the 'creation' theories then current. Of course, these creation ideas then held by many natural scientists would be discounted today; some suggested a "creative air", some a "plastic virtue" influencing new creations in nature. Many saw all changes in living things as necessarily discontinuous. All of these were discussed in Darwin's notes and letters. Most of his contemporaries thought that nature revealed purpose and design by a provident Creator, a strong 'natural theology'. But Darwin believed that his observations were in many ways inconsistent with all of these notions; the cross symbols in fig. 2 give the dates of his notes to that effect.

Next, though Darwin's education was influenced strongly by reading Paley, whose arguments from nature to Divine design he had at first accepted enthisiastically, he realised most ingeniously that if species were mutable, and if extinction were their price for failure to adapt in a partly hostile and changing competitive environment, then adaptation would leave those species which survive with an *appearance* of design. He had discovered an ambiguous explanation for apparent design. He wrestled with the evidence for adaptation. The star symbols on Fig. 2 show references in the notebooks to these ideas, which he accepted readily,

with extinctions, as taking the place of willed design in nature. Paley and others had written about Divine 'contrivance' which meant a purposeful arrangement in nature. Cuvier believed that if adaptation took place it was from a basis of several pre-arranged plans for all living forms. Early in his work, Darwin eschewed "all contrivance"[10], which had been supported in Whewell's *Bridgewater Treatise*, and he rejected Cuvier's 'plans'[12].

Darwin was thinking about 'the species question' during his voyage. In the summer of 1836 he wrote in his 'Animals' catalogue, "Are the various specimens of mice which I have collected varieties or species? Their geographic distribution often causes me to doubt"[7].

Soon, towards the autumn of 1837, he began to write notes which not only criticised 'creation' but added to the grounds for these criticisms ideas which were based upon or incorporated the idea of natural selection. The dates of these notes, which involved the assumption of an hypothesis as yet not tested as it would be later, are shown by the hash symbols on Fig. 2.

At the same time Darwin's notes began to use the word 'explain' or 'explanation', shown in Fig. 2 by the symbol 'I'.

Even more oddly, Darwin began also at this time to use the phrase 'my theory' in the notes. He clearly knew the very rigid criteria for scientific induction set out in Whewell's *Philosophy* and *History of the Inductive Sciences*; he possessed the *History* and sent his copy to Charles Babbage in 1837[13]. He had read Herschel on the Philosophy of Science[14] and knew Newton's '*vera causa*' rules for the attribution of natural causes[15]. He knew that induction should progress by the collection of as wide a variety of facts as possible, raising from these inductive hypotheses, and then exposing them to as wide a range of tests as might be possible. Only then, and depending on its power to explain and to predict phenomena, might an hypothesis be selected as a theory.

Lastly, it has often been thought that Darwin could not invnet experiemnts to test his theory because natural selection is of necessity slow and involves the past. Not so; he adopted Lyell's view of geological process[16], that because nature is taken to be continuous in operation, the patterns of the present must necessarily reveal the changes of the past. Darwin's method was to count the numbers of species *in genera*, arguing that *genera* in rapid evolutionary change will contain more species than those in decline. He referred to these ideas in notes shown by the symbol 'S' in fig. 2. Of course, this method depended on the correct identification of species, a step which Darwin often got wrong until his specimens were identified more correctly by others, especially John Gould[7].

This suggests that Darwin was looking for patterns of a defined and pre determined kind of the sort set out by Herschel, Whewell and Lyell, within his evidence. He

sought 'natural laws', and believed they would be found for living things just as they had been in the physical sciences. References to natural laws are shown as 'L' in Fig 2.

Among Darwin's mentors were Charles Lyell[17], his cousin Hensleigh Wedgewood[18] the philologist and the botanist Henslow. For the first two at least, scientific work must be within certain assumptions.

1. The study of nature will show that it operates under natural laws. These will be found to be analogous to those discovered already in physics for gravity and for light. Arguments from such analogies appear frequently in Darwin's notes[19].
2. Natural processes are continuous, hence the facts about them will always show what they called "connexion"[20]. Nature does not change by discontinuity, as Bacon had said, "*natura non facit saltem*"[21].
3. Natural processes will be uniform across the universe[22].
4. Any natural process is reducible to elements which have been 'imbued' with certain properties *ab initio*[23], and whose later courses are determined by consequence under natural laws; these consequences were called 'intermediate causes'[24].
5. The range of ideas associable with nature must include only those which are open to reason, or derived by its use. 'Revelation' has no place, nor anything else which is attributable to any personal choice or influence such as 'design', 'plan', 'purpose', 'direction' or 'contrivance'.
6. Complementarity of causal factors was not recognised, since the simplest explanation was seen to be sufficient. Darwin called this 'Maupertuis' criterion[25]. Today it is often called 'Occam's razor'. Higher explanatory features are seen as redundant; explanation can be sufficient but not exhaustive, so it will be 'either-or', not 'both-and' in character.
7. Natural laws are discovered by the widest possible range of observations and inductive reasoning therefrom.

These ideas are explicit in Herschel's 'Preliminary Discourse'[26], and appear in many places in Darwin's notes where his phrases follow Hershel's exactly, including his references to 'explanation' and 'connexion'.

Now it might be said at this point, 'Was not Darwin just being a very good scientist? Are these points not the very essence of scientific method?' In one sense this must be agreed. The remarkable thing about Darwin was the purity of his dedication to good scientific method when so many of his teachers and the most distinguished men of his times followed less pure forms of ideas. They often followed, to varying degrees, Baconian conceptual rationalism, that new

discoveries must cohere with a known theoretical framework. At least in his natural history, Darwin practised scientific empiricism[27], allowing facts to challenge preconceptions. His great discovery was that organic evolution is a natural mechanism at least up to phylum level. It has happened, is happening and will no doubt continue to happen. Indeed, nature in a partly hostile and changing environment could not continue without this survival process of adaptation. But is this all that can be said? I do not think so; Herschel's scientific ideology was highly physically deterministic, but Darwin's more so; though he amassed a staggeringly comprehensive array of patiently researched natural observation, he sought and found what he looked for according to a rigid set of criteria. Here are some of the problems which I think can now be seen in his work and attitudes.

First, he was able to cover only part of the range of mechanisms which are necessarily involved. From the start he realised that Erasmus Darwin's idea was correct, namely that gametic (but not vegetative) reproduction was the entry point for the variation in animals and plants; but he admitted that he could not discover the sources of variation. In his efforts to seek out the controls of natural form and function he came amazingly close to predicting some sort of genetic theory in his ideas about 'gemmules'[28]. So his 'explanation' covered only only mass effects, but not their controls.

In Darwin's later correspondece many wrote to him about aspects of nature which seemed inexplicable by natural selection, such as beauty[29], life itself[30], adaptations which, though seemingly open to explanation by successive small steps, could carry no perceptible advantage for selection until those steps were completed[31]. Darwin replied that he had never claimed that evolution by natural selection could account for everything, only for most things in nature[32,33], but that over questions of suffering, Divine provenance and metaphysics in general he was 'muddled'[34].

I now want to revisit three of the areas just mentioned to examine them in more detail. First, the issue of complementarity of explanation. Darwin's theory saw nature purely from 'bottom up'[35]; all took place by the successive summation of many small variations by natural selection; if complexity arose, this was because survival advantage acted as a complexity accumulator. He claimed that this process could explain even the highest levels of mental functions whether intelligence, consciousness or even religious supposition was concerned[36]. He agreed strongly with Comte[37], that man's spiritual awareness was an illusory assumption based on false reading of evidence[38]. Even the idea of a Divinity itself had arisen by a mistaken aggregation of simpler causes[39]. This, with explanation restricted by Maupertuis' criterion to sufficient but not exhaustive causes, effectively omitted levels with a complementary relationship. It is interesting that Lyell, whose scientific views were closely similar, thought that the evidence

ruled out transmutation of species in his classic three volume *Principles of Geology*[40]. Darwin read the second volume just after his voyage in March 1837, and against Lyell's "infinite divergence ... being prevented" Darwin pencilled, "if this were true, 'adios' theory"[41]. This must have been an early comment; he was not to resolve the divergence problem fully until 1852[42]. But he showed his imposed, simplistic 'bottom up' view of nature by his increasing irritation with John Herschel who wrote, "an intelligence, guided by purpose, must be continually in action to bias the direction of the steps of change"; as Peter Brent has pointed out[43], "it was precisely the elimination of that hypothetical intelligence that seemed to him (Darwin) his greatest triumph". 'Top down' explanation in any form, whether or not present, was ruled out of Darwin's reckoning *ab initio*.

So, Darwin's investigation of nature was pre-committed to a view rather like that of a sunlit scene viewed through polarising glasses. This was, in a remarkably successful way, a very helpful thing to do. It revealed the facts of biological evolution which had been suspected but never clarified, from the muddle of theoretical presuppositions imposed upon and mingled with observations. But his assertion that natural selection explained most things but not all was not consistent with his implied denial of complementary explanation, his *a priori* rejection of the concurrence of 'intermediate causes' with higher levels of agency in the natural world.

What happens if evidence is viewed through, as it were a polarising filter? The evidence which is seen is entirely valid; it gives a valid though partial account of what is there. So an observer may make two mistakes; some things that are happening may be missed, and some which happen for complex reasons may look as if they happen for simpler reasons. And even prolonged and careful observation will find no shred of evidence for what cannot be seen in the polarised view.

I should explain here in what sense 'complementarity' of explanation is to be used in this discusion. It is in the broad sense of logical complementarity that the word is used. This concept began with 'particle' and 'wave' descriptions of fundamental physical entities, though Niels Bohr extended it to all fields of human experience so that the concept was not confined to particle physics. Nor is it to be understood in the very restricted dimensional framework of the confusions which can arise when objects are viewed in either two or three dimensions. Donald Mackay[44] set out logical tests for the use of such notions of complemetarity with these criteria:

1. Two postulated complemetary accounts must refer to exactly the same object.
2. The two postulated explanations must be hierarchically different in the sense of being at different logical levels of description.

3. In such an hierarchy, the 'higher' level of description must presuppose the lower, reveling its significance in fresh categories of explanation. But the lower must not presuppose the higher level.
4. Only if a higher explanatory level rules out a lower cause can they be said to contadict or be opposed to one another.

So, with that in mind, let us now turn to a second problem with Darwin's proposed causal system for organic evolution. This was to presuppose a mechanical, or determined, universe in which all that ever happens must be the inevitable consequence of intermediate causes. This view was firmly set upon ideas framed by Newton, by Liebniz, Butler, Descartes and Laplace to name but some amongst many philosophers; Comte held the same and Darwin agreed. And of course, to view the world through a rigid deterministic preconception means in no way that nothing will be seen. Where there are 'natural laws' they will often be detected; if there are events for which complementary explanations may exist they will seem to have simpler explanations. Since most readily observable events are mass effects, subtler causes will not appear. This is why the triumphs of astronomy so dominated Darwin's analogical reasoning[45]. In physics, there cannot be a simpler mass effect than huge bodies spinning in a gravitational field in a near vacuum. Indeed, as Laplace told the Emperor, for a 'bottom up' description no more complex explanation is needed for the solar system. All that the planets do can be 'explained' at the lowest level of description. But the mistake is to restrict observation and explanation to that which may be so described, and then to generalise from this to higher levels. The evidence for such views in Darwin's writings occurs in many places, notably for the essential place of natural law argued by analogy with physics, astronomy and geology[19], in the assumed necessary continuity of all natural processes (or 'connexion')[20,21] and the uniformity of natural process[21], and the assumed 'imbuing' *ab initio* of the simplest parts of nature[14] with properties that would lead to the spontaneous evolution of complextity by the summation of successive small steps.

Now physical determinism is dead, for several cogent reasons. First, as Karl Popper has shown so lucidly[46], scientific method depends not just on observations, but on observations made with a defined precision of measurement. In no way could Darwin's work and determinism have been based on such precise observational criteria; as a presupposition through which nature was viewed. It was undoubtedly valid in substantial part but could never be generalised therefrom to all that takes place. A second reason for the death of determinism is 'active information'[47]. This arises from quantum mechanics and the expressions for the Schrödinger equation which describes them. The relevant points for biology are that the source of heritable variation is now known to be DNA; variation occurs largely through mutation of DNA, which is caused in turn by a variety of physical

mechanisms which include thermodynamic, ionisation and molecular rearrangement events. The determinist assumption is that these mutations must confrm to the kind of physical laws of mechanics and thermodynamics opened by Newton and others to our understanding. However, it is now clear that this is not so; the simplest sub-atomic particles react not only to the energy and electrical fields around them by mechanical responses, but also to the form of the quantum potential field open to them. They respond not only, for example, to voltage gradients but also to information. This is not information in the Shannon sense, but the gradients of the quantum potential which they encounter.

This is much like the situation where a huge ship changes course not just because its engines and rudders change their mechanical outputs, but because radio signals have been received causing a change of course; the energy of the signal is vanishingly small compared with that needed to move the ship[47]. The mathematics is not without interest in this context. The response is dependent on the Laplacian of a term which occurs in both the numerator and denominator of the quantum potential, hence it depends solely upon second order rates of change, not upon the size of the quantum signal. It is also interesting to note that the reduced, mechanical interpretation of Schrödinger's equation depended on the argument that if the wavefront was large compared to the wavelength of the polar expression, then the quantum potential term could be omitted because it became vanishingly small. Particles are then represented as following only Maxwell laws for electromagnetic forces. Only when this term is included does the particle's equation of motion show that its trajectory conforms to the shape of the quantum potential field. That response is non-Newtonian, though it conserves thermodynamic principles; it also coheres with the findings of experiments. This understanding, together with new facts about behaviour of chaotic and vortex systems show that the universe is at its most basic levels 'open' and not a closed, mechanically necessitated system. One might be tempted to think that where predictable, Newtonian mechanical events occur then 'active information' phenomena are not part of their 'explanation', but are exceptions to the rule of natural laws. But this would be a complete mistake; these phenomena are foundational and structural elements from the universal realm of subatomic events which can control and influence the familiar world of mechanical causation[48]. The large mass effects are simply the limiting case of wave mechanics for which the wavelength is zero. This renders the explantions and expectations of a pure physical determinism impossible to sustain. The controlling hopes of Darwin's scientific age become inconsistent and the predictive power of natural laws, to which Darwin averred so often[49] cannot be realised. The meaning of this has been shown most lucidly by John Polkinghorne[50].

Are there phenomena for which an 'explanation' confined to natural selection of successive, summed small variations may be insufficient to account? One

which has been clarified recently is 'irreducible complexity'. Michael Behe has described this for a range of biochemical examples[51]. It was Mivart who first raised the problems of complexity for natural selection[31], but both Paley and Darwin had discussed the example of the mammalian eye and Darwin had produced convincing arguments that even such a complex structure could have arisen from the summation of a long series of advantageous small changes. Mivart missed the essential point of irreducible complexity; if Darwin's theory is that successive, small, spontaneously arising changes can be selected favourably for their reproductive advantage, in a world of intense competition, then if favourable selection tends to survival, these variations speciate and such species diverge and become established. Failure to adapt brings extinction. Now, if successive small changes are not advantageous, though their final sum is, then extinction could occur before that sum can be attained. Are there examples of complex mechanisms for which such a sequence seems likely? Behe argues that there are. Consider two simple examples, not from biochemistry but form natural history.

Many butterfly pupae hang downwards from a silken pad to which the rear feet of the pupating larva are hooked. But some families (the *Pieridae* and *Papillionidae*) pupate in a semi-erect position, no doubt for the very Darwinian advantge of protective mimicry; to resemble a bud or leaf ensure better chances of survival amongst predators. How does the larva do it? As pupation starts, it hunches in a head up posture, and starts to secrete and to spin a silken girdle which it attaches to the plant stem at both its ends as each thread is spun to and fro. It does not allow the girdle to stick to itself. When spun, the girdle is entered by the larva placing its head through the loop so that it just reaches about a third of the way along its length. It then becomes a pupa, which the girdle now supports around its thorax.

Now, we cannot suppose intelligence or foresight on the part of the larva to explain its deeds. On a purely Darwinian mechanism there are three dissociable steps needed to evolve such behaviour; the assumption of a vertical/head up posture, the girdle spinning and the insertion of the head and several segments through it while pupating. Now, if these three aspects are supposed to have been acquired successively, and if those variations could have appeared in any order, which combinations of them would have given advantage to the insect, and so have been selected, and which would have lacked advantage and so led to non-selection? Take all possible combinations of three factors, multiply each by all possible permutations of these groups and then reach a verdict for each such product. Then sum all of the products. There are fifteen products, and only one seems to gain advantage; it is the possession of all three factors together.

What is the likelihood of a strictly Darwinian mechanism being the explanation

for the possession of three factors together? The probability of a single point mutation is about 1 : 100,000, so this probability is cubed for any eventual individual having all three. If now the Darwinian theory is given a prior probability of 0.5, that is there are equal chances it may or may not be the explanation for the attainemnt of the three factors, the posterior probability is 1 : 10^{15} and the Bayesian likelihood of a Darwinian explanation falls from 0.5 to about 0.13.

Now, as the number of combined factors needed to evoke some complex advantage rises, the likelihood of their being gained by independent successive mutations falls precipitately. Consider the small marsupial, the American yapok[52] which catches prey under water. It is not hard to see that this would not happen with a conventional marsupium opening upwards; underwater predation would be impossible with an inflatable braking parachute filled with young yapoks. This animal has seven adaptations to survive: the pouch opens downwards, it has grease glands along the edge and hairs in a streamline and a sphincter muscle to achieve watertight closure; but the young are adapted to sustained hypoxia. For good measure, the males gain streamlining by tucking their genitals into their pouch while swimming, using another set of specialised muscles. And both sexes have webbed feet. Here there are clearly a hierarchy of adaptations; primary ones are underwater predation, pouch inversion, muscular pouch ties and juvenile hypoxic tolerance. The other three could well be seen as secondary. For four concurrent adaptations the likelilhood of a Darwinian explanation is about 0.03; for seven it would be 1.5 x 10^{-4}.

These are but two simple examples; Behe gives several at more complex levels of biochemistry. Please note that I am not saying that this proves Divine design as the alternative explanation; I am only stating that strict evolutionary explanations under mechanical law seem unlikely to explain all that can be seen of such living things however adequate they might be to explain phenomena in, say, the earth's crust.

Now, what of the present scene of contention? There are wholistic determinists and/or reductionists who follow Darwinian reasoning; in a recent TV broadcast James Watson, co-discoverer of genetic code and Nobel Laureate said, "Anyone who sees God in this is just dull". Richard Dawkins, Professor of Communication of Science at Oxford wrote, "To 'tame' chance means to break down the very improbable into less improbable components *arranged in series* (my italics)[53]. Well, we've just looked at that, not using simple probability but the more relevant likelihood of the natural selection hypothesis. He also wrote, "Living organisms exist for the benefit of DNA rather than the other way round"[54]. This is a bottom-up argument which denies several of the hierarchical barriers of logical argument.

But on the other side there are many religious believers who argue, with even less logic, that because evolution is a mechanism unworthy of the creator it

cannot have happened, or be happening. Darwin used the same argument against creation[55]. Some, whist accepting that evolution has occurred in varying degrees, still struggle with the determinstic *impasse* of the 'causal joint' of divine agency in nature, which implies a universal Newtonian energy transferring mechanical agency within space-time[56]. I have argued that it is now wrong to aver that such an imagined mechanical agency *must* be the explanation of change in nature, and that therefore Divine or other current agencies are impossible. Scripture states repeatedly that God 'speaks' to nature and it obeys[57]. We must agree that this figure tells us nothing of *how* this can occur, but the disciples saw it happen many times, to the man with the shrivelled hand[58], with the storm on the lake[59], to the man born blind[60]. Like Darwin, many assume that these could not have been real events, but imagined by those who looked for miracle[61]. They have no explanation in a universe of mechanical natural laws.

Interestingly, it was Charles Babbage who saw further in his rebuke to the eight clerical authors of the *Bridgewater Treatises*. Arguing from the model of his own 'difference engine'[62] he showed how nature may be susceptible to a variety of controls beyond the usual, and that 'miracle' could result at the discretion of the originator of the engine. Later discoveries show how true his intuitions can be; he did not show how such things occur, but that physical determinism cannot show that they are impossible. He argued two more things from his postulated 'thought experiment'. These were, that the inventor (or creator) of the engine could not only vary its *modus operandi* but could foretell what the outcomes would be for its users under the varied rules. Also, he showed that this combination of prophesied outcome, followed by fulfillment, was the sole incontrovertible evidence that the inventor was the cause of that outcome.

Ramsay[63] objected to natural selection because it seemed to envisage a God who made things by series of micromiracles. Darwin responded to this in the *Origin of Species*[64]. Herschel had split sharply between purely natural process under laws and miracle[65], a view echoed by Darwin in letters to Baden Powell[21] and to H. Bronn[66]. Again, it is interesting that when Darwin's scientific logic was attacked it was defended by John Stuart Mill on particular grounds; that Darwin had, he said, shown not what had occurred but what could have done so by the mechanisms which he had described[67]. The explanation was sufficient within its limits, not not necessarily exhaustive.

Darwin was greatly troubled by the difficulties for his explanation posed by suffering and pain in nature; he saw that many variations in living things are harmful, and so would be operated against by natural selection[68]. So he felt that God could not be their author. He did not seem to see that this negative view was as much a theological statement as the creationists' positive arguments about divine design with which he disagreed so strongly. This view denied his own principles of

purity of physical determinism. He had from his earliest work sought to follow Hutton and Lyell in extending their principles for geology into the world of living things[69]. Christian apologists had fallen into a fallacy of 'the God of the Gaps'; here was its mirror image in a 'no God of the non-gaps' type of explanation.

The limitations of 'explanation' have been reviewed lucidly by Michael Poole[70] and Roger Trigg[71] who both apply a reasoned analysis of it to Darwin's thought. Darwin's 'explanation' was such for only a limited range, a restricted area of natural process. That process is, I believe, far deeper in extent and the product of a far greater intelligence than we can imagine, grasp or explain. Much of its working will be forever beyond scientific exploration; it is understood by faith but not by controlled observation[72]. 'Evolution' and 'creation' are complementary aspects of polarised accounts. Neither necessitates rules which contradict the other. So, chairman, I am only a disciple of Babbage and Herschel for whom if nature worked in part as a mechanism then the way to uncover the explanation for that aspect of it was by scrupulous scientific method. The method was necessitated by the possibilities; but disclosures under its use were not in principle all that might be true about causality in nature, nor did the method predetermine the possibilities. Seen at the coarsest levels, nature may indeed seem determined; at finer levels it clearly is not. Yet it is the finer levels which control the mass phenomena; they are related in a complemetary hierarchy neither level of explanation excludes the other.

Ackowledgements

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Figure 1. Time chart of Darwin's use of 'explain' and 'explanation' in correspondence related to 'the species question'.

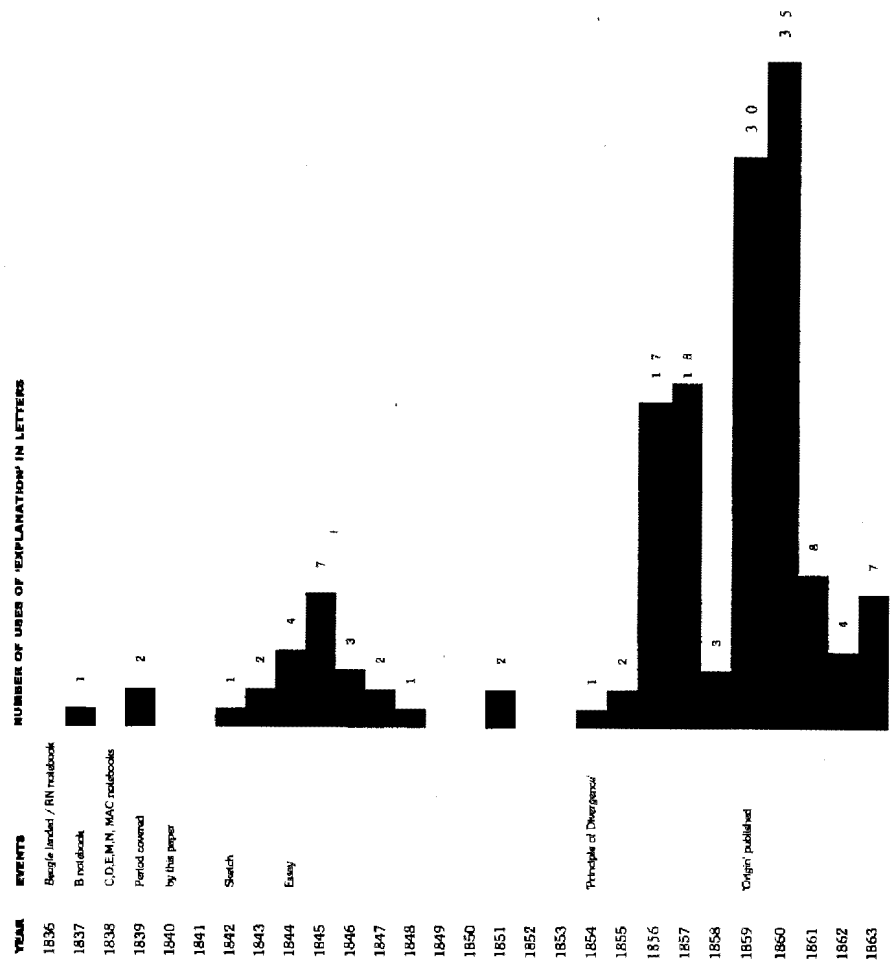
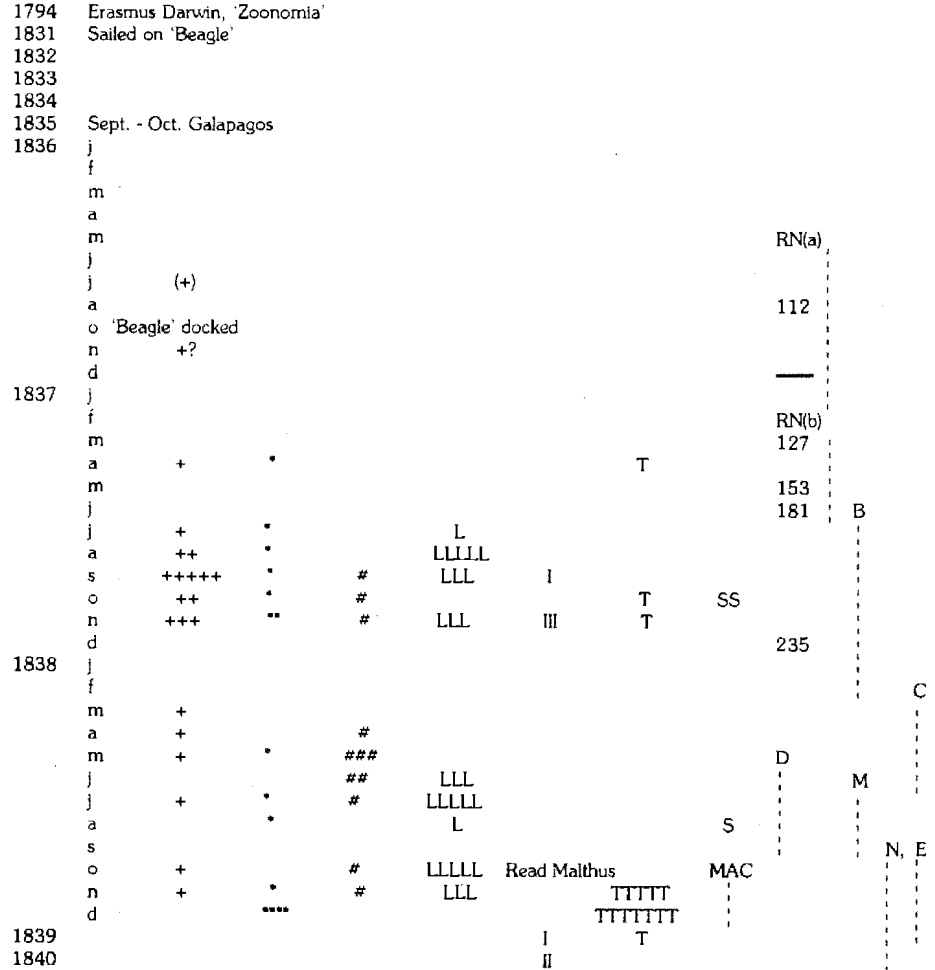


Figure 2 **DARWIN'S VOYAGE AND NOTEBOOKS**



Key: RN, B, C, D, E, M, N, MAC - Darwin's notebooks. Broken lines cover dates. Numbers are dateable Darwin paragraph numbers.

\+ notes critical of 'creation' when contrasted with demonstrable facts.

• reference to 'adaptation.'

\# notes as +, but embodying presupposed natural selection ideas.

L reference to natural laws.

I notes stating that natural selection 'explains' a class of facts.

T reference to 'my theory'.

S reference to species/genera ratios.

Book Review

Frank Parkinson, *Jehovah and Hyperspace: Exploring the Future of Science, Religion and Society*, London: New European Publications, 2002.
ISBN 1-872410-21-0 pb, 418pp + xvii, £13.

This book is actually a collection of recent talks and discussion papers, at a popular level, together with a few book reviews and poems. They are edited into a sort of progression, from the Big Bang as proof of God, through brain science and quantum physics, to social ethics. As such, it is difficult to summarise, since it covers such a broad range of interests. Suffice to say that anyone acquainted with the thought of Teilhard de Chardin would find here a kindred scientific mystic. It would be easy to point out over simplifications and misrepresentations, but such superficiality is really inherent in the format.

In his introduction, he says that the book's 'overarching theme is that the change in human nature which has happened as our species has evolved is still in progress and moving us towards a new level of consciousness.' (p1) coupled with this is the portrayal of Jesus as the 'new man' in whom the future direction of human evolution is known', which runs through all sections of the book. This he links with Paul's view of Jesus as the 'second Adam' and Christ's own self-designations as 'Son of Man'. However, as he says, this 'forces us to prove that there is something normative about Jesus.' (p303) Unfortunately, he has already destroyed all the traditional arguments for Jesus having this status.

He rejects all that is miraculous and supernatural in the gospels, not only such favourite targets of 'demythologisers' as Jesus' Virgin Conception and Ascension, but even his Bodily Resurrection. Yet, if Jesus is no longer 'declared with power to be the Son of God by his resurrection from the dead' (Romans 14), why should we make him 'the primary model of what constitutes a better person'? (p. 303)

Parkinson argues, firstly, that Christianity gave us a linear view of time and laid the foundations of modern science. This is true, but, as he recognises himself, it can also be true of Judaism and Islam. He also argues that Jesus 'has inspired ... the global culture that we call the Western mind. The values of democracy, individual freedom and justice, which we take so much for granted, can be traced to the inner logic of Jesus' father God, for if all are children of one loving divinity, we are brothers and sisters and our self-value is rooted in the sense of its *[sic]* love.' (p139) This may be true, but note, he is using Western values to authenticate Jesus, not the other way round. Yet these values can no longer be taken as self-evident. A mosque near my home, for example, has been notorious for teaching that such values are wrong. I fear that Parkinson too readily dismisses Paul's assertion that, 'if Christ has not been raised, your faith is futile.' (1 Corinthians 15:17)

It might be wondered why someone who evidently has a great respect for Christ is so loath to accept much that the Gospels say about him. He interprets such things as reflecting a primitive, unscientific 'flat earth' view of the world. Since such a view is contrary to modern science, he holds that things that reflect it can no longer be believed. But is not theological language metaphorical, and can there not be visual metaphors? A good example is the Ascension, which he particularly dislikes. Is this really about someone literally flying up to a literal heaven above the clouds? Parkinson himself uses 'higher' in a non-spatial sense ('higher consciousness' etc). The bulk of the New Testament has no interest in the literal details of the Ascension, but much to say about Christ's ascended, higher status. What better way could God have impressed this on the minds of the disciples than by causing them to see Jesus go up before he disappeared? Would they have received the same assurance if he had just disappeared or gone into the ground?

My comments on his view of Christ must be negative, but it would be unfair to judge his book solely by that. He has many interesting and important ideas, that spark off a desire in me to follow them up through his references, and debate them. That was presumably the point of the original talks and discussion papers, so he achieves what he set out to do! In particular, his theme of Christ as the first of a new humanity is certainly one that is scriptural, but insufficiently developed in western theology. For this reviewer, though, his failure to take seriously the portrait of Jesus in the gospels means that the whole sweeping edifice of his thought is built on foundations of sand.

Bob Allaway

Bob Allaway is a former research chemist, now a Baptist Minister in North London.

Cumulative Index Part 4

The first part of this index was published in Bulletin 27 (April 2000) and covers volumes 1 to 43 (1866 to 1911); Part 2 (Bulletin 28) volumes 44 to 70 (1912 to 1938); Part 3 (Bulletins 29 - 31) volumes 71 to 100 (1939 to 1973).; Part 4 (Bulletins 32 - 33) volumes 101 to 105 (1974 - 1978). Part 5, which now follows, covers volumes 106 - 110 (1979-1983).

Abbreviations

Asterisk (*) - the first page of an article; **c** - correspondence; **d** - contribution to a discusssion; **f** - and pages following; **r** - review; **rw** - writer of a review.

To save space titles of papers and headings are indexed under key words only and not given in full. Also '10' is omitted in volume numbers: e.g. **6**-107 indicated volume 106 page 107.

Journal of the Transactions of The Victoria Institute, continued (after Vol. 90) as Faith and Thought.

1979 Vol. 106 to 1983 Vol. 110

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