

N.B. This is an earlier version of a piece later re-written by I.M. of which there is only a print-out currently available at Lode. It is a provisional and unchecked account. Please treat as such.

The Scientist

It is the chief curiosity of Robert's life that he wrote his most important book at a time when he was in a state of nervous exhaustion verging on breakdown. How this affected the work it is difficult to say. Would it have been better if he had been in his entirely "right mind"? Or in that condition would he have judged too clearly that it was unwise to proceed? Nowhere is there a clue about why he made the decision to write **Vestiges of the Natural History of Creation** during a rest cure in St Andrews in his fortieth year. Reasons suggest themselves; he needed something absolutely absorbing to focus his attention away from his own problems; the desire to write it had been growing in him for some time and he just had to let off the head of steam that had been gathering; the desire for a change of lifestyle had also been frustrating him, and he felt this book might provide the openings he was looking for.

A series of letters written from St Andrews, reveals the nature and the extent of Robert's problems. The fact that he homed in on William as the chief contributor to his collapse is symptomatic of a particular form of mental confusion. His letters show an untypical note of hysteria, a thrashing round for someone to blame, and William was at hand. This was not altogether fair obviously, and as nobody has bothered to preserve the answers that William gave, and perhaps defences against the accusations, it is hard to make judgments.

One letter is especially irritable and accusing; "the apparent impossibility of getting you to associate harmoniously in the employment of other pens was partly what led me to resolve upon taking some other course of life" he wrote. Robert's first articles had always been one of the most popular parts of the **Journal**, and rather naturally William wanted him to continue writing them, without being aware of the strain they were causing. As Robert now explained: "it is very different to write when and what I can, and to be pushed eternally beyond the limits of both ability and inclination." He must have mentioned this desire to be rid of the First Articles to other people, because a letter of 1839 from De Quincey asks if he can take over this task.

It was written on the 23rd January 1839, seven years into the **Journal**. De Quincey was by that time an indebted resident of the jail at Holyrood. "I have accidentally heard a report, upon which I now found a proposal. The report was that you were weary of the connection with the Essays written for your Journal...Nobody could have the presumption to (illegible) his aid upon so eminent a public instructor as yourself in any other character than that of one who happened to have disposable leisure offering to relieve another who had too little...I should be happy to furnish a series of Essays on Life and manners, literature and other subjects...I am at present for 3 or 4 months to come condemned to fight off creditors with one hand whilst with the other I furnish support for nine persons daily..." He suggested as his first contribution "Conversation as Art." He was turned down it seems, which was a pity, both for him, for Robert, and for the **Journal**.

In St Andrews Robert frequently met the great Sir David Brewster, and was relieved to hear that in his early days he suffered too; "he when engaged on a great amount of hard work on his encyclopaedia had experienced precisely the same morbid feelings which I have done in similar circumstances. For one thing he became afraid to face people in the street and in walking home to his house in Coates Crescent he used to go by Rose Street to avoid meeting anyone he knew. This was precisely my case...only I took a line of march under the rails on the south side of Princes Street. Even in learning about which feelings are disease there is an alleviating of the evil, for it removes the deplorable fear that one is about to go altogether a wreck. It is certainly a great pity that these things are not better understood - only to think of the atrocious family persecutions against me while I was in this state - all under the falsest suppositions - and that I could not take a single evenings relief from my destructive avocations by meeting with my friends, without having to suffer some annoyance for it...The unfortunate results of this error are not yet terminated, since a throughly venery occurence in life can never be sweetened in the memory."

Here the suffering man and the interested researcher view his predicament together. Understanding of mental problems was, as he had so often noted in his writings, tenuous and vague. For him the terrifying thing was not knowing the precise nature of what was happening to him. A slightly calmer letter, undated but written about the same time, expressed relief that his fear of madness was receding; "now that I am aware of what is the matter with me, and convinced of its cause, I feel comparatively relieved. There is a very great difference between thinking oneself depressed and thinking oneself diseased; and knowing the cause one may have some hope of removing it and recovering."

The cause he was sure was overwork, and the cure to retreat from the **Journal**. "I do not see why this step should not be taken, Perhaps you feel disposed to carry it on independently of me or with only such occasional aid as I can give , and it may be possible to make an arrangement for that purpose. But I do not think favourably of this scheme, which seems to partake too much of the character of those half measures which rarely or never succeed. My wish is for active life or bustle, free from the necessity of exerting the higher powers of the intellect except when I choose."

Another letter, written in pencil so perhaps a draft only, added further thoughts on winding up the **Journal**. William had proposed a Cyclopaedia of Roman Literature, which increased burden seems inappropriate at a time when Robert needed a rest; however the idea appealed and Robert even wanted to extend it into French, German and Italian literature "Indeed I have lately been considering that speculations of this kind might speedily supercede the necessity of any longer carrying on the Journal...I dont know whether you will be startled to hear me speaking of discontinuing the Journal or not. I daresay you once hinted at some such notion yourself...whether or not I am quite serious in thinking that this step may be taken at the twelfth volume. My reasons are these. I feel that I have given the best of my mind to the Journal already, and that hereafter I must be constantly a deteriorating contributor...By being cut short at the twelfth volume it would be left as a large, but not too large mass of miscellaneous reading, containing the best productions of humour, fancy sentiment and philosophy which my mind could give while it was at its meridian...The second and strongest reason is that I now do think that I now require to make some considerable change in my course of life, ordinary monotonous literary employment I find reduces me to a condition of mind far from being sound, involving a

sensitiveness and irritability incompatible with the common rules of life, and which are productive of the extremest misery, insomuch that only under some pretty strong incitement, from company, or while engaged in some engrossing amusement, that I ever enjoy even common serenity of mind, not to speak of cheerfulness or happiness. I have long battled with this, attributing it to all sorts of causes, or blaming myself for it, but from finding relief in occasional change or bustle I am now convinced that it is merely a disease, the result of too long protracted and too unvaried literary labour, particularly in the department of first articles for the **Journal**, which have always been peculiarly tasking. Congenial and encouraging springs around me might have softened these a little, but I daresay nothing could quite extinguish it."

The letter continued to put forward alternatives to the **Journal**, and discussed the young man Wills, under consideration as an editorial assistant. Here Robert suddenly reverted to a normal tone, his sharp, critical eye unimpressed by a specimen article of the applicant; "He may be a very respectable young man on other accounts, but no true literary man, no man with a real gift for literature could have expressed himself as he has done in the first sentences of that article...It may be as well to get what work from him you can during the currency of the fortunately brief engagement, but I'm satisfied that he is not the man for us..." In fact Wills stayed with them, married their sister Janet, went on to become a prop to Charles Dickens and remained a close and supportive friend.

Robert showed this letter to Anne, and she sent a covering one to William, both written in December 1842. "I fear you may be greatly startled by it as I was" she wrote, as if this was the first she had heard of the plan to fold up the Journal. "You will perceive that Robert has now come to the conclusion that his mind is rather unsound, partly in a diseased state, and he feels he cannot long continue with this incessant mental exertion. I fear this is too true, he is irritable and sensitive to a degree that you can hardly imagine...Last night when he gave me the letter to read (a few words illegible) merely because I did not all at once jump to his opinions, but quietly gave him a few arguments against passages, he left me quite disconcerted and with tears in his eyes said 'If I have not you for a friend I have nobody and if you do not confide with me can I expect others to do so.' I tried to convince him that it would really have been silly to say anything he proposed was right but this would not do, and it was only by writing a kind conciliatory note and sending it to his room that he afterwards spoke pleasantly and calmly...I think from this small statement from me you may better understand his case and be able to guide what will be the best course to take. I think you cannot blame me for expressing this trifling weakness when the matter is so good. To another living soul in this world I would not own that he had a fault with the exception of this partial unsoundness which I doubt time may remove..."

Anne went on to explain that travel, variety and change, were the cures for Robert's depression, and he could write the while. "He is sadly afraid that Mr Wills is not to turn out a good writer and if that would prove to be the case it would tie him more down than ever. Of course if Robert were going from home for weeks at a time I would require to go with him for he finds it is dull to be alone...I think we had better not say one word to your mother either about Robert or this. She is I fear so weak that she would not bear any shocks..." Anne went on to thank William and his wife for presents to her children and ended with a burst of concern: "I am seriously anxious about Robert, his condition...by the low desponding tone of his letters, and I think I will cut out two or three bits of them to show you. He told me how very kind you had all been to him and what a very pleasant dinner party you had had, but notwithstanding all this he felt quite depressed. I then said that he must now be fully aware that the

kindness or unkindness of his friends had nothing to do with the change of his mind. He owned that he had now come to the conclusion that it was mental exertion alone at the same time that the kindness and affection of friends soothed him greatly." Believe me your most affectionate Anne she ended; that and the allusions to William and Harriet's kindness shows they had done their best to help Robert, in spite of his accusations.

By April the following year, 1843, Robert was writing from Edinburgh: "I have now settled on this, that I contemplate going to London permanently at the close of this year. He (William) said he was willing to make any arrangements that would answer my views - to go himself if I chose - but I thought it best for the general interest that I should be the London resident as the more literary person ... This may then be considered as a nearly certain prospect, but we need not speak of it yet. I shall be somewhat concerned to leave good kind hearted St Andrews, and the links, but on the whole the movement will be advantageous and it will be a great pleasure to settle finally down again, and have all things arranged about us as we would wish. I shall for my part enjoy the business of collecting a library about me vastly."

This is a much calmer and more rational letter, but a week later he wrote "If I could only keep up my spirits all would be well, but for several days I have not been so cheerful and the irritability of my nerves is so great that I can scarcely sleep. I think I should have been much better at home this week, there are so many unpleasant associations about Edinburgh." This in spite of the fact that his mother was there, and ill; she died six months later. Ten days later he wrote from Eccles Hotel in London; "I am glad to say that I continue on the whole better in spirits than when I left you though somehow my nervous irritability is even greater than it was then, so much so that whatever fatigue I undergo I cannot sleep much above four hours out the four and twenty. However I cannot help but be convinced that this would entirely vanish if I was absorbed in some active employment. The roughing about and the lively humour of my companions do me a great deal of good during the day, but it is chiefly while lying awake in the morning that I feel the nervousness. To prevent it as far as possible I avoid all indulgence in liquors for the excitement of sightseeing and general novelty of circumstances is bad enough without that addition. Indeed I now have a much higher opinion than before of the suburbs of London, and feel no doubt that it will be possible to get a very pleasant residence if we do take the flight now contemplated."

A few tranquillising tablets would have helped Robert with his "nerves" and sleeplessness.

A couple of weeks later, still in London, he wrote; "My only evil lies in solitude, monotony and the want of male society of the kind to awaken and interest my mind. I begin to feel a hopefulness rising within me regarding our future life here, as if it were likely to be something very superior to what I have known for many years, and in the hope alone I experience much gratification. It was not till yesterday that I got calls made upon my friends in the west, I first called upon Mr Carlyle and his lady at Chelsea and found them comfortably lodged in a £35 house in a dullish street but about to be driven from it by the maddening disharmony of a neighbouring pianoforte worked from morning till night by a learner..." Thomas Carlyle spent a lot of time being disturbed by noises; he made himself a sound proof room so as not to have his nerves shattered by passing trains, but continued to grumble. Robert went on to visit a more cheerful Mrs Hall, a regular contributor to the **Journal**, who would look out for houses for them.

In June Robert was in Edinburgh again and announced that William had offered to be the one to go to London "so after all it is agreed that we shall hold the matter in suspense for a few months and then consider which shall be the moving party." One of them had to go, since their relationship had reached a point where "I feel that I could not live in Edinburgh if they live in it, sympathies having been so disrupted I should feel it as a constant punishment. Even already I find the whole association disagreeable in the extreme. Their ideas are not my ideas, their friends are not my friends - even the way in which one of these persons declines having a potato at dinner excites in me an antipathy beyond description." A sad state of affairs, and Robert was no doubt exaggerating, but rightly or wrongly he blamed his brother for his condition. This was the occasion when he gave his talk on savings at the Chambers firms soiree, and he was able to tell Anne "It is amazing how prosperous everything is about the whole concern...Page gives satisfaction and Wills is still in good form." However irritating William was at the dinner table, he was keeping the company together at a time of crisis, with the help of Wills and Page; who was eventually to give a great deal of dissatisfaction.

In August Robert was back in Edinburgh with more thoughts on their move. "If London be the choice after all I am rather inclined to try it for a year with you in a furnished house without the children. I have been pondering whether I ought not pass the remainder of life in Scotland if I get so far emancipated from duty as to be able to give myself up to favourite lines of study, but how this emancipation - whether my allowing things to go on as they best might without me, keeping my means thus in the line (sic) of business, or withdraw with a limited competency - perhaps £600 a year - and be content with a very moderate style of living, regaled by the pleasure of following favourite pursuits. The last plan is obviously the least advantageous for the family, yet men often give up the real means of happiness for the little more and the little more...I would certainly choose Musselburgh as a place of residence as there I should be able to resort to libraries etc in Edinburgh and also have means of amusement...indeed it is highly desirable that while part of vigorous existence remains I should be able to address myself to one or two tasks of an important nature with which my name might hereafter be connected...You may be sure I shall take no step without seeing very clearly my way before me."

The thought of moving to Musselburgh on £600 a year can hardly have been welcome to Anne, about to produce her tenth child. In none of his letters does Robert mention the book he is writing, and she is transcribing; the book to launch him into a world he wants so much to be a part of, shedding the essays, concentrating on geology with all the powers of his brilliant mind. It all came to nothing. A letter of the following February, 1844, when he was moving back to Edinburgh to live in the house his mother had occupied in Atholl Crescent, hinted at a reason. "I continue to get very pleasantly along at the office - W. is really quite a different person from what he used to be, he now is a civilised being, a pity to have spent ten years of life without enjoyment because he could not or would not exemplify the manners of an ordinary Christian." Whatever William's change of mind, Robert's was patently restored, and though he continued to suffer from vague bouts of depression and sleeplessness, he never became seriously unhinged again, though he continued to write for the **Journal**, produce biographies, revise his work on folklore and produce a great many articles and pamphlets on sea-margins and glaciers.

One last set of letters, of 1859, show that the brothers were still at odds, and both of them by this time were exasperated with the behaviour of their young brother David which didn't help. William's wife Harriet had something to do with the problem too, how much it is hard to say. The angriest letter

Robert wrote was on March 28 1859, and this time without the excuse of being mentally disturbed.

Harriet had written to him, and he said he didn't want to answer her, and continued; "I have only to say that you having chosen a life of all but complete alienation from me and mine - for several years quite complete - being to all experience cold and negative where my family feelings are most warmly concerned - I have come in my turn to be alienated from your roof-tree and my moral feelings revolt at any simulation of a friendship which has no existence. Anne tells me you profess to be unconscious of having given any cause for offence. And that may be quite true. To put yourself for a quarter of a century into such a relation to a brother that you do not know his children when you see them and they do not know you, that some do not know where you live, and others never even saw you, that the only thing he has for years heard from you regarding the most innocent and defenceless of them is a repetition of injurious tittle tattle from mean sources, is not exactly giving cause of offence, it is only securing the loss of affection. Such a frame of life towards not only myself but others as nearly related to you, should make it no surprise to you that I decline joining in an affair where you appear as the general benefactor....The seed however is sown and its fruits appear. Our new form of relation, so different from that of early and apparently less fortunate days, is fixed, and there will henceforward remain. I have taught myself to submit to it, and the best you can do is to learn the same lesson."

This sad and angry letter echoes the feelings expressed in an earlier one of 1843. "You and I have made wonderful progress in the world, but there has been one element sadly wanting, among us all, the cultivation of the social feelings. Many people have more happiness in comparative poverty from being pleasant and kind to one another, than we with all our unexampled prosperity...it may only be necessary that business connections cease." The curious aspect of the whole affair is that business in fact prospered for all the unpleasant interviews and acerbic correspondence. William and Harriet long outlived Robert and Anne, and the Chambers firm thrived when all of them were dead. The blame for the rift is hard to apportion, but some of it probably lies in William's unhappy marriage, childlessness, and great empty mansion by the Tweed; it must only be a guess. It is interesting to note that Robert mentioned "years" of trouble; all those years when the pair of them were triumphantly taking the publishing world by storm.

St Andrews was chosen for its good sea air, its links, its university and library and accessibility; Robert made frequent trips back to the office during the eighteen months they were there. It was a quiet, conservative town, noted for its allegiance to the Jacobite cause, its United College "dingy, rude and ruinous to a degree, provoking the contempt of strangers" Robert noted though the town was presently being knocked about by its provost Playfair. He was laying down smooth slab pavements each side of Market Street furnished with a double row of gas lamps, work that was appreciated by all except the painters who died in large numbers from white lead poisoning. He also ordered the pulling down of houses he conceived to be in the wrong place, freshened up areas round the port to the advantage of the fishermen, and laid out a splendid garden for himself to show what could be done. A letter from Anne shows that Brewster was fighting against the provost's plans. "Oh that Sir David| what a thorn in the side of St Andrews he is| It is frustrating to see the Mayor's efforts for the benefit of the place thwarted." Thorns in the flesh of "improvers" were to be welcomed; it was a pity that some of them were not there to prick provost William Chambers when he set about improving Edinburgh.

The Chambers took Abbey Park, a large mansion overlooking the ruined cathedral and its graveyard (where Robert would one day lie), near the sea but close to the market place, university and golf links. Here Robert settled down to write, and in the afternoons played golf, and enjoyed with Anne the social life of a civilised community. He joined the local Philosophical Society, whose president was Brewster; it must have given him wry amusement to think what his fellow philosophers would think if they knew what he was working on in his room round the corner. St Andrews, and the adjacent coast was rich in geological formations; raised beaches, glacial valleys and the like, and one can imagine his tired mind expanding in new directions as he walked the rocks; a mind that was not only expanding but filling with an excitement that he was to share with the world.

Whether the revelation came in a flash of sudden enlightenment, or was a slow process, the result of wide reading and of the reports of the geologists, almost daily unearthing new and unsettling evidence, Robert didn't reveal. "Those dreadful hammers" Ruskin bewailed, "I hear the clink of them at the end of every cadence of the Bible verses." A lot of people were hearing them and trying to reconcile their beliefs about the creation of the world with what Hugh Miller called "The Testimony of the Rocks." One of the people listening with close attention was Robert Chambers. To his aid, bringing into sharp focus what had been fuzzy guesswork, were more sophisticated microscopes and telescopes.

Some scholars have suggested that **Vestiges** was long in Robert's mind, that it was the natural outcome of the general current belief in progress, and particularly of the assumptions of the liberal Whig politics of his Edinburgh circle, centring on George Combe. The thinking is that gradual sustained development was the way the world had evolved and that in his book Robert would prove that this law of nature justified the social measures he and his friends advocated; slow and steady advance, how the world had always worked from the beginning.

Given his state of mind as he sat down to collect his thoughts, the liberal views of his friends would not seem to have been a positive influence. Freed of the weekly grind of **Journal** articles, that mind, tired and disturbed as it was, could at last concentrate on a mass of new (and not so new) information that had been "in the air" for half a century, a faint but increasing buzz about a staggering shift of perception of the world, whose implications would be as great as the discoveries of Copernicus and Galileo.

The Frenchmen La Place, Maupertius, Buffon, Diderot, Montesquieu, Lamarck, freer than the church-bound British to express their views, had been throwing out hints; Lamarck indeed had more than hinted, he had written a carefully argued work on evolution which only erred in giving too much emphasis to the unproven theory of the inheritance of acquired characteristics. But the French Revolution linked anarchy and scientific studies; safer to stay with a world created by an inventive God in fits and starts, using floods and volcanos to wipe out mistakes, than to discard Genesis and settle for a materialistic view of slow evolution ruled by chance and necessity.

One or two Germans had grown sceptical too; De Baer, Goethe, Leibnitz and Herder who almost put his finger on the idea of natural selection with his "universal tendency to the maximum production of living things which led to a struggle for existence and more highly organised and better adapted beings."

Darwin's grandfather Erasmus, a brilliant dilettante, thought that "all warm blooded animals have arisen from one living filament" and, with a few extra thoughts added by paleontologists, biologists and geologists, he was right. All of them were dancing round the fire as it were, throwing in pieces of explosive new evidence, and then standing back from the flames. It only needed someone brave enough, not only to face the flames, but to shape the blaze into a triumphant beacon.

To change the metaphor, the picture was clear, nearly all the pieces of the jigsaw were in place, and Robert Chambers was ready to assemble it, filling in the missing pieces as convincingly as he could. The publication of Charles Lyell's **Principles of Geology** in 1830 was an enormously important piece, proving beyond reasonable doubt that vast expanses of time had gone to the making of the planet, and that a succession of events, uninterrupted by floods or earthquakes but governed by scientific laws, had produced a uniformitarian theory which could only be explained by evolution. What sort of God would take so long, and make so many mistakes along the way which needed to be wiped out by fire and water, to make a world? Strangely Lyell himself took some time (nearly thirty years) to accept the verdict for which he had provided the evidence.

As Robert sat down in his study, did he jot down the facts, for and against his Progressive theory one wonders. If he did the list would go something like;

1. A clear definition of species, provided as long ago as 1630 by John Ray, made it possible to show how these had changed over time. Unfortunately both Ray, and later more forcefully the Frenchman Buffon, had defined species as those "that breed among themselves so that one species does not grow from the seed of another species", a belief that continued to be held as a sacred truth even when experiments in plant hybridisation had refuted it. Linnaeus refined Ray's work of categorisation, and held the accepted view on species, though he was extremely shaken to find a toad flax plant which had quite clearly broken the law and changed.

2. Fossil evidence which showed a distinct progress from the simple to the more complicated, these last being generally nearest to the surface.

3. A persistence of species from one geological era to another, which made constant creation, deluges and volcanos ridiculous.

4. A world infinitely older than previously imagined or the Bible implied; the mere presence of river valleys gave the lie to "constant creation."

5. "Unity of form" in the structure of vertebrates, which the work of Buffon and Cuvier had made evident, showing not only that they were related but that they had a common ancestor.

6. Studies of larva and embryo which seemed to show a recapitulation of the process of species evolution, or at least again point to a common origin.

7. The presence of rudimentary organs.

8. A basic law underlying all the endless varieties and stratagems of the organic world, as laid forth by naturalists from John Ray onwards.

9. Proof that the world was not only incredibly ancient, but that it had changed gradually and uniformly as Lyell had shown, and was not the plaything of a vacillating deity.

10. Geographic distribution of the same animals in widely varying climates and conditions, and, equally at variance with the Bible story, the same climate being the home to a huge variety of species.

Robert was accused of "baseless speculation" which is hard to understand, given that he speculated

on the same bases used by Darwin and Huxley. What he couldn't produce was the exact mechanism of change, the vital force which propelled life along, and which he could only call the Law of Development. Others had groped with equal vagueness towards a definition; "blind purposiveness" "formative force", "inner potency", "internal principle", "hidden predisposition" or just "tendency to change" were suggestions that floated nebulously in the academic air.

When and if Robert wrote his list For Evolution, he might have drawn a line and added a column Against. There were long gaps in the fossil evidence. There was the sudden appearance of groups of more advanced creatures in the lowest strata which seemed to deny the theory of progress from simple to complicated. There were sudden arrivals of new species without any apparent "links", and equally sudden disappearances. There was no evidence to prove that superposition necessarily implied relation.

But the biggest sticking point was the law that like produces like, that cross breeding leads to sterility. Selective breeding in both the animal and plant kingdom was in progress, and Robert would have done well to concentrate on this, as did Darwin, who by years of experiments in hybridisation showed that the law had so many exceptions that nature, like man, could circumvent it. Robert offered instead the model of a God who had set the mechanism of the organic world going, but like the calculating machine invented by Charles Babbage, God's computer had built into it the possibility of deviation. Like everything else in the book, he suggested this as a hypothesis. When Darwin read **Vestiges** he gave the idea absolutely no attention, not an exclamation mark nor some sidelines. However ingenious, it was obviously unprovable as a theory unless the mind of God was an area of scientific speculation, which was absurd.

This unscientific piety of **Vestiges** irritated both Darwin and Huxley, who didn't realise Robert's efforts not to affront the parsons were more calculated than sincere. "Slyest of obscurantists" was how Schopenhauer described the men of the cloth, but Robert's family business relied to a considerable extent on church schools buying the **Educational Course**, and he had to be tactful. His efforts to convince the experts without antagonising the church were doomed to failure, but if Darwin and Huxley had seen his private letters to Ireland they would have understood that his piety was contrived. "Those dogs of clergy" he described them, and talked of "enlightening the people out of their present fatal Christianity." "I have been able to introduce some views about religion which will help to keep the book on tolerable terms with the public" he assured Ireland when the 6th edition appeared. Uncomfortably leading scientists were often clergymen.

Robert gave the clearest account of why he had written the book in his "Explanations", a pamphlet to refute some of the accusations that had been levelled against him. His aim he said was no less than to solve the last great mystery of science, where had life come from? He could not, in the light of recent discoveries in the rocks, accept the old story that man was the exception to the rules that governed the rest of the animal kingdom; all life was one and connected. This unpalatable truth was the hardest his readers had to swallow, and he softened it the best he could, but saw no way of evading it altogether.

In his uncertain state of mind it was a daunting task he set himself; to solve the last great mystery of life was, however, quite in vogue at the time. Six years earlier a certain dilettante called Crosse thought

he had done it when he found worms appearing from nowhere. His discoveries caused a sensation at the time, and were one of the unfortunate inclusions in Robert's book. It seemed necessary to show how inorganic life had become organic before Robert could move on from the first stirrings of single celled existence through fishes, reptiles, birds, mammals to man.

The difficulty about reading **Vestiges** now - and it is a short book which can be read in a day - is that it has lost the shocking impact it had in 1844. For all its suspect examples and false analogies, it had hit on the truth, but a truth which has now become an almost stale assumption. It is also now a matter of little moment to many people that God has been shifted aside. At the time he was writing it was a frightening possibility. Robert knew that, with the facts he presented, "there must be a complete revolution in the view that is generally taken of our relation to the Father of our being." A war would have to be waged between the "cherished and the avowed" and the battlefield would be bloody. One of the casualties had to be man's cherished view of himself as God's favourite, the only one with a soul.

And without a soul, what became of the incarnation, the redemption, the whole magnificent but now seemingly hollow epic of Christianity? Robert told the story of evolution as God-based, and had to find ways round such difficulties. The original plan was benevolent, the results the best that could be expected. Darwin saw it otherwise; a panorama of cruelty and injustice, waste and futility; facts inescapable and scientifically examined convinced him. When **Vestiges** was written there were less facts, more guesses. But there was enough to devastate the clerics, one of whom Monck Mason spoke for them all.

Where was the human race that Jesus came to save he asked? Why redemption for creatures which still carried the remains of their ape like tails? Life everlasting for this animal linked through endless ages with shellfish? Jesus was superfluous if **Vestiges** was right, all their beliefs a mockery and delusion. If there was a God he was the one Pope had aridly written of:

"Who sees with equal eye as God of all
A hero perish or a sparrow fall
Atoms or systems into ruin hurled
And now a bubble burst, and now a world."

George Combe in a letter summed up **Vestiges** well; "its grand themes are development of all organised beings out of inorganic matter and the formation and government of the world by general laws." His brother Andrew pointed out; "Many men long before he was born advocated the principle of the Creator acting in all his doings on general and unvarying laws, which is quite a different question...while the transition theory seemed to me to be attended with greater difficulty than that of successive creation of new species of animals."

The transition theory was what **Vestiges** was all about, as opposed to the creationism of current thinking. Darwin cut down the creationists to size; "Do they really believe that at innumerable periods in the earth's history certain elemental atoms have been commanded suddenly to flash into living tissue?" Herbert Spencer asked some equally scathing questions about the theory of the sudden appearance of a new species; "Is it thrown down from the clouds? or must we hold to the notion that it struggles up from the ground? Do its limbs and viscera rush together from all points of the compass?" A current

commentator, Professor Lovejoy, looks equally askance at the belief. "For no man outside a madhouse ever behaved in such a manner as that in which by this hypothesis the Creator of the universe was supposed to have behaved;" not only wiping out his previous quite good ideas, but replacing them with others later to be discarded. They did really believe it, and more firmly in 1844 and in Calvinistic Scotland.

Many clerics - who were often geologists which made it especially difficult for them - produced ingenious theories to try to explain what those wretched hammers were revealing. The Dean of Westminster decided that a single species of each genus had been created "in a plastic condition" and by interbreeding the rest had followed; his God was the kind of potter Huxley proposed, who made moulds and then threw them away when a better idea occurred to him. Another cleric decided God had produced all the varieties for fun, "almost like toys in a shop" as Darwin put it. They were partly for His delight, but more for the pleasure of His favourite, man.

But, Darwin argued, there were plenty of species before man appeared. "Were the beautiful shells of the Eocene epoch and the gracefully sculptured ammonites of the secondary period created that men might ages afterwards admire them in his cabinet?" As for flowers, their beauty was not for man at all, but, as his experiments proved, to attract insects. No matter, scientists continued to believe in their version of things, their version of God. After all even the great Cuvier was a cataclysmist, who thought that a world flood explained the disappearance of species.

The **Vestiges of Creation** tried to steer a delicate course through the seas of prejudice and ignorance that surrounded the story of life on earth, but without much success. It met a storm of criticism and hostility from practically everybody but on one thing they all agreed; it was very well written; "powerfully and clearly" said Lockhart, who disliked almost everything about it; "seductive and charming" thought Heiton in spite of its "wretched theory, false facts and most unscientific science;" "clever but shallow" Darwin dismissed it as; "scintillating" thought Charles Lamb. Huxley though disliked its style, which he found rhetorical, and its pious undertones which he found unscientific.

Today its seductions are less obvious, and partly for the reason that its conclusions have long ceased to surprise. We follow Robert's journeys through the solar system, down to earth to look at the ancient rocks, where the first shelled creatures started to appear; into the red sandstone where fishes with scales that did not overlap "approximate to the form and armature of the crustaceans" and so, along a road now familiar, up to mammals and man. There were no land animals to begin with because there was no land; a mistake, but a reasonable assumption.

In the new red sandstone "a new and startling appearance" left its fossils, a kind of monitor lizard. And so through the saurians, (the dinosaurs), the insects of the oolite period, marsupials, clearly a "link", up to mammals and at last carnivores, monkeys and man. In six breath-taking chapters the reader is propelled through limitless time and with absolute conviction Robert wrote; "that the organic creation was thus progressive through a long space of time rests on evidence which nothing can overturn or gainsay." Many would agree with him so far, but would still insist that each step forward had been a new act of creation from on high.

Now he felt the need to explain how the whole process got started, how the dead universe became a live and progressive one; to solve the great mystery in fact. Where was the move from inorganic to organic and what triggered it off? He proposed an electric current of some kind and referred to experiments with mercury which crystallised into the shapes of plants, and saw the possibility that "the Almighty Deviser might establish all the vegetable forms with which the earth is overspread" by a judicious use of electric currents. He quoted the rather dubious experiments of a Frenchman to support these unscientific cogitations, but worse was to follow.

If, he argued, this life-originating force, electrical or otherwise, worked at the beginning, then it could still be active. For instance, where did the clover come from which appeared in fields where none had been planted? Where did intestinal parasites come from, being in places "having no communication from without." Some sort of spontaneous generation must have taken place, the Great Deviser behind it, but men acting as His instruments in creating the right conditions; for instance that Mr Crosse whose experiments in crystallisation produced tiny worms and whose work was enthusiastically carried on by a Mr Weekes of Sandwich.

These were the false facts and unscientific science so scoffed at, and it was a pity this chapter "Origin of the Animated Tribes" was ever written. He moved on to safer ground, and showed "an advance under favour of peculiar conditions from the simplest forms of being to the next more complicated and this through the medium of the ordinary process of generation." No Great Deviser or Superhuman Potter here, but a natural process an "inherent impulse" for want of a more exact understanding of the mechanics of change. Vague this might have been but others more eminent found no better words for the process. There was one law that seemed to have been broken though, the absolute rule that like produces like. Happily he had a possible ally in showing that this was not so absolute; someone a lot more reputable than Mr Crosse; Charles Babbage Professor of Mathematics at Cambridge.

Babbage had invented a machine, the most primitive computer, into which figures were fed to show complicated progressions. The series of numbers accumulated in an orderly way, but then something extraordinary happened. "The law which seemed at first to govern this series failed at the hundred million and second term" and then again at the 2762 nd term and so on at different intervals. To Robert "this powerfully suggests that this ordinary procedure may be subordinate to a higher law which only permits it for a time, and in proper season interrupts and changes it." This was not the creationist God, constantly interfering with life forms, but the Machine Maker, who on a grander scale than Mr Babbage, had made laws which at intervals, and with His forethought, could be broken. The law that like produces like was a case in point.

The mechanism of change still had to be explained more fundamentally, and he wrestled with the problem. An excursion into the world of bees offered clues. The queen bees eggs developed into either workers or drones, according to the food given to them. Here was change effected by conditions in the egg; so why not the same results in the womb? Weak and poor mothers would give birth to offspring changed for the worse, and vice versa. This principle could be stretched to imagine "an access of favourable conditions sufficient to...make a fish mother develop a reptile heart, or a reptile mother develop a mammal one;" an observation that drew plenty of exclamation marks from Darwin when he

The Frenchman Lamarck had offered a theory of wants creating habits creating changes in structure, and Robert accepted this in part, but thought it inadequate, "Climate, soil, temperature, land, water, air - the peculiarities of food, and the various ways in which it is to be sought" all these things working together were sufficient, over time, to lead to adaptations and finally transformations.

He made forays into linguistics and anthropology, interesting but flawed, before he reached the last and most difficult chapter, the inevitable end of the journey from the stars, mankind. Up to now, the minds of men and of animals had been thought of as distinct. "the latter being comprehended under the term instinct, while ours are collectively described as mind, mind being again a received synonym with soul, the immortal part of man." This idea on investigation was untenable. "There is in reality nothing to prevent our regarding man as especially endowed with an immortal spirit, at the same time that his ordinary mental manifestations are looked upon as simple phenomena resulting from organisation, those of the lower animals being phenomena absolutely the same in character though developed within narrower limits." Readers who had followed him this far would have choked on this distressing conclusion. They might have been mollified by a long footnote, a quotation from Hope's "On the origin and prospects of Man", in which immortality could be rescued intact from Robert's glum assumptions.

Hope assured his readers that the next life "promises us a mind like the present, founded on time and space...a mind composed of elements of matter more extended, more perfect and more glorious... a mind which, freed from the partial and uneven combination incidental to it on this globe, will be exempt from the changes for evil...a mind which, no longer fearing death, the total decomposition to which it is subject on this globe, will thenceforth continue last and immortal." As a convinced spiritualist, Robert later accepted this vision himself, somehow accommodating it to his views expressed in **Vestiges**.

In his "**Antiquity of Man**" written nearly twenty years after **Vestiges**, Lyell confirmed Robert's conclusion that the difference between man and ape was only one of degree. By then the brains of primates had been studied seriously, and in the case of chimpanzees only been found to differ in size. Lyell, wise and cautious, did not feel able to pronounce how important was size in defining intelligence. As for the "immaterial principle", which could be defined as soul, reason or instinct, even the unbeliever Agazziz admitted that "most of the arguments of philosophy in favour of the immortality of Man apply equally to ...other living beings." Lyell, like others, thought the main difference was in an abstract notion of good and evil, and "religious sentiments implanted by nature in his soul," though he didn't elaborate on what he meant by nature or the soul.

Robert found support for his own ideas in phrenology, a science to which he gave qualified support. According to this, animals' brains were divided in the same way as man's, each part in charge of a faculty or emotion, though the areas were fewer and less subtle. This led to a short contemplation on the moral problems involved, a subject not particularly relevant but much in his mind; "men begin to see the true case of criminals - namely that while one department are victims of erroneous social conditions, another are brought to error by tendencies which they are only unfortunate having inherited from nature." This being the case the law must address itself "less to the direct punishment than to the reformation and care-taking of those liable to its attention." These were opinions he had often aired in

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the **Journal**, but could not help bringing up once more. This section of the book led his fiercest critic Adam Sedgwick to say that the book must have been written by "some crack brained phrenologist."

The last chapter took a look at the world seen through his thesis; "that the whole is complete on one principle. The masses of space are formed by law. Law makes them in due time theatres of existence for plants and animals; sensation, disposition, intellect are all in like manner developed and sustained in action by law. The inorganic has one final comprehensive law, GRAVITATION. The organic, the other great department of mundane things, rests in like manner on one law and that is DEVELOPMENT." It was not a very happy picture; suffering and inequality everywhere, but the Great Ruler of Nature had established laws which even He could not break and that was that. "Give me extension and movement and I will make the world" claimed Descartes. Robert wanted spontaneous generation and the law of development.

In fact his final conclusion presented the Divine Ruler as a despot unconcerned for individuals, only interested in the great game. "It is clear, moreover, from the whole scope of the natural laws, that the individual, as far as the present sphere of being is concerned, is to the Author of Nature a consideration of inferior moment. Everywhere we see the arrangements for the species perfect; the individual is left as it were to take his chance amidst the melee of the various laws affecting him." Tennyson expressed it in some of his most famous lines;

"Are God and Nature then at strife
That Nature lends such evil dreams?
So careful of the type she seems
So careless of the single life.

So careful of the type? but no
From scarp'd cliff and quarried stone
She cries "A thousand types are gone
I care for nothing, all shall go."

The book starting in the stars ended in an imperfect world which had evolved with the minimum of interference from on high; no floods, no miracles, just creatures evolving and dying out for a variety of reasons that were still not clear, but would in time become so. It would, it had to, all come right in the end; Robert was sure of it, Tennyson convinced himself and the fearful doubting people who read him that the shattering news they were hearing must not over-alarm.

"That God which ever lives and loves
One God, one law, one element,
And one far off divine event
To which the whole creation moves."

Robert had, he felt, covered all the important points; the fossil evidence, the presence of rudimentary organs, the evidence of "links", embryonic studies, geographical distribution, unity of form. He had done the best he could with the obstacles, such as the continuing presence of primitive forms;

this he had explained by a process of "branching" rather than a simple ladder from bottom to top. Mr Babbage's machine dealt (tenuously) with the mechanism of change, and other objections could be explained by a simple lack of evidence about fossils, knowledge at present fragmentary but daily growing. Even with some pieces still missing, the picture was clear.

Robert had moved his family back to Edinburgh in the spring of 1844, and **Vestiges** was published that autumn. He sent off copies to all the top scientists, whose surprise and pleasure he eagerly anticipated. In spite of his early precaution in remaining anonymous, he was surprisingly relaxed about the impact of the book; unlike Darwin who confessed to his friend Hooker that telling the secret of evolution was like "confessing a murder". If he had known about the letters flying backwards and forwards between the recipients of the free copies, urging one another on to deflate and demoralise such an imposter, he would have been less cheerful. The one who finally agreed to speak for them all was Adam Sedgwick, the geologist and divine from Cambridge. His forty page outburst in the **Edinburgh Review** of June 1845 drove Robert to write a long pamphlet, "Explanations", to answer his scornful questions.

Why, Sedgwick asked, if there are such obvious links between species, can we not see them? Why is evolution not still visibly in progress? Why do "higher" forms still exist along with the lowest in the same strata? Why are there large gaps in the chain? During the periods of change, why did the new species not get swamped? Changes would become ever more complex as the nervous systems evolved; could the law of development explain all this? In fact what was this law?

Sedgwick objected to the whole idea of a chain of being. "We have spent years of active life looking for an ascending scale...but we looked in vain, and we were weak enough to bow to nature" he wrote with regal self assurance. Simply, Robert said, he had not looked far enough. It was like the man who only knew juvenile schools and might say "Finding no specimens of humanity under 3 feet high we are weak enough to bow to nature and believe that babes are a mere fancy." The Woodwardian professor must have writhed at the "crack brained phrenologist" daring to question his research methods.

Sedgwick believed that God made the conditions, and then put in plants and animals to fit. Why then asked Robert, did He wait endless ages, surveying seas bare of fishes, and land of creatures? It made no sense, except in terms of his theory of transmutation, when long empty periods were exactly what was required to allow changes to take place. As for Sedgwick's objection that there was no evidence of the transition from one species to another, did the professor know how to detect such evidence? Rudimentary organs were an important one, and "the simple fact of reptiles following fish in this grand march of life through the morning of time" could not be avoided.

Robert went on with this line of reasoning. Crocodiles showed the biconcave form of vertebra, the structure of teeth, the position of the nostrils, which linked them with fish, and the dinosaurs which were an intermediary line "exhibit the most striking harmony with the theory of progressive development;" the lowest had a fish like body and tail, the highest "betray an approach to the mammalian type." Sedgwick was sceptical about this; he admitted (as a geologist he had to) that there was "a development of

nature's kingdom, nearer and nearer to living types." but produced a convenient law of decline and fall to account for this. Inventing unverifiable laws was a national pastime, indeed international.

Scathingly, but accurately Sedgwick summed up the work "in which we learn that the humblest organic structures began first and were produced by Electricity or some like power of common nature...That nature having thus made a start all difficulties are over. For by progressive breeding the first monads will work their way without any external help through all the ascending scale of things...and so builds up a scale of nature which is to be an index of universal creative law." This he described as "Sober truth and solemn nonsense", "trashy skimmings of philosophy" in which, declared this bachelor clergyman he could "trace the markings of a woman's foot."

Very well, Robert was goaded to write, what about answering these questions. If God created animals why in an ascending order? Why when for aeons the conditions could have supported them, were there no birds and mammals? Why the endless variations? Was it really possible that God was using "special miracles to introduce new species, one with perhaps an additional tooth, another with a new tuvercle or cusp in the third molar." God in fact could work any way He chose was the philosophers' answer to this; or any way they presumed to read His mind. Spinoza held that He had to act in a certain God like fashion; Leibnitz that being God He was absolutely free. Hume pushed the whole issue aside by attributing to habit all mankind's beliefs about questions human and divine.

Robert was fighting a losing battle with Sedgwick, who felt the same way about Darwin's **Origin of Species**. By the time Huxley came to write his vicious review nine years later, he was fairly inured to the slings and arrows of outraged men of science. Huxley, a man he greatly admired, knew through Darwin who was the author of **Vestiges**, so when he talked of "a mass of pretentious nonsense" "whining assertions of sincerity" "the product of coarse feeling operating in a crude intellect" an "unfortunate scientific parvenu" it was Robert Chambers he was hitting out at. Darwin wrote to tell Huxley he thought his review "exquisite and inimitable", though he was "rather hard on the poor author."

Since Darwin himself had reached the same conclusions, and since Huxley was to be his greatest supporter in five years time, a word of apology might then have been in order. After Robert was dead Huxley acknowledged this was "the only review I ever have qualms of conscience about on the grounds of needless savagery." Robert, however hurt he was, supported the pair of them in their hour of need.

The problem with the first couple of editions of **Vestiges** reflected the dangers of deep secrecy in which it had been written. When Anne had copied out the chapters, they were sent to a trusted friend Alexander Ireland in Manchester, who then passed them onto the publisher Churchill in London, who was ignorant of their author; at least for a while. This meant that Robert couldn't consult any of the experts in the fields he was walking over with misplaced confidence. By the time he did get the help of a scholar, William Carpenter, a lot of damage had been done.

Professor Forbes of St Andrews university writing to William Whewell at Cambridge when the fifth addition, with an appendix, appeared in 1846, put it well. This he said "is written with considerable skill and temper and to have clearly the upper hand with the Reviewers in several points. I mean to say the Edinburgh Review seemed to me a grievous failure" (Sedgwick's piece) "I do not mean in point of argument but in the method of putting it and in the temper in which it was put. It was to me utterly unreadable - I did not read a quarter of it - and so it was generally felt here. The author of Vestiges

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(who is now generally believed to be a denizen of Modern Athens) has shown himself a very apt scholar and has improved his knowledge and his arguments so much since his First Edition that his ideas no longer appear so disgusting. It was well that he began to write in the feelings of his ignorance and presumptions, for had he begun now he might have been more dangerous." It is curious that Forbes, an eminent geologist, could confess himself afraid of what Robert Chambers the publisher had written.

Robert was prepared for the hostility of the church but when the reviews started appearing criticizing not his morality but his science, he knew something must be done. In January 1845 the Athenaeum spoke for many others. The author was a "dabbler in science" his facts strung together "by a series of generalisations, hypotheses which will most of them turn out incorrect...his object is not so much the exhibition of truth as the establishment of his own opinions." The reviewer saw him as "a large reader but not an original observer, and one who has mixed little with the men of science of his day", near enough to the truth; Robert had scientific friends but was not a member of the inner circle; Murchison, Owen, Lyell, Agazziz, Whewell, Mantell, Buckland who formed a prestigious club he greatly wanted to join.

But when the book came out Robert was happily unaware of the need for expert advice; he was remarkably buoyant, and urged the publisher to have **Vestiges** ready before the November British Association meeting of 1844 since he expected it to create a sensation. He ordered free copies to be sent to Buckland, Carpenter, Lankester, Murchison, Nichol, Forbes, Mantell, Lyell, Vivian and the Reverends Tayler and Pye Smith. If he had known that that same June Darwin had just finished writing up his species theory, he would undoubtedly have included him in the list. Only a small print out, with one hundred and fifty free copies, was circulated. Robert was the cautious publisher as well as the excited author. After a couple of months it was safe to start the run of a second edition, and he wrote a long letter to Ireland which is worth quoting in full, since it dispels theories that he revelled in anonymity as a piquant selling point in the manner of Scott's Waverley.

Two favourable reviews gave him immense pleasure. "Having kept his hopes down at the lowest mark - like a prudent cool Scotchman as he is - he accordingly feels much elated by tokens of success so unequivocal, and which have in a manner burst upon him. He capers in thought at the idea of Lockhart's note considering how that serpent would speak of him at this moment...This testimony is also valuable as affording a hope that after all the opus may be passable before the world with an author's name at it." The omens seemed favourable; a few more encouraging reviews and he could emerge from behind the veil. He was happily unaware of the knives being sharpened by all the men he most wanted to please. They left it to Sedgwick to deliver the blow, but that was six months ahead, during which time **Vestiges** would be in its fourth edition.

Of course the book was at first quite a sensation, both in Edinburgh and London, for the theory it propounded was revolutionary in every sense. Prince Albert was suggested as the author, which made it quite difficult to dig the knives in too deep; others included George Combe, Catherine Crowe, Byron's daughter the Countess of Lovelace, and Robert himself; a mixed bunch indeed. Yet in spite of this initial buzz, Robert was writing on January 8th "After all no word from Churchill about the sale or the need for a third edition...how different from the anxiety he showed to get forward the 2nd." One of the frustrations he felt, as a publisher, was the restrictions anonymity placed on him to organise the

By March 1st he was smarting under adverse comments, and distressed at the silence of all those scientists to whom he had sent free copies. Now recovered from his depressive illness, he could think clearly about what was wrong with his book, and perhaps regret a little his rush to publish. On March 1st he wrote to Ireland to ask Churchill to write to Dr Carpenter to say he "requires a scientific assistant for the proposed revision of the book. He begs to know if Dr Carpenter will for any moderate fee, left to his own appointment, undertake to get the volume thoroughly revised...he will employ other persons, such a man for instance as Edward Forbes in the natural history and some equally able person for the Geology...Dr Carpenter will of course consider this communication as confidential and take care that he makes overtures to no man in whose honour he cannot depend." His first hopes of stepping forth as the author quickly and permanently faded.

Carpenter had written for the Educational Course, and was also a Unitarian with liberal views, dependable and perhaps even sympathetic. However as is often the case, the advice Carpenter gave was not always gratefully or gracefully received. "I dont think it will do him any harm to see that the author is not quite a fool" Robert wrote huffily to Ireland as the fourth edition was preparing, "His corrections are of much less value than perhaps he himself thinks, for many of them only express views different from what I find sufficiently authorised by others fully his equals. Much in short is controversial." He also thought Carpenter's demand for £30 too high, though he paid it with only a grumble to Ireland.

This fourth addition, written with Carpenter's help, was the one Forbes had noted to be a dangerous improvement, and Robert too was satisfied. "I believe this new chapter is the greatest burst of light on the animal kingdom that has happened since Cuvier's time" he confided, although he still had no encouragement from scholars. Only one had the courtesy to thank "the author" for his presentation copy. This was Richard Owen, one of the greatest physiologists of the day. He said he had read the book "with profit and pleasure" but there were certain points he disagreed with.

For instance Mr Crosse's experiments; "having had personal experience of the inadequacy of the preventive means adopted by Mr Crosse, the like inadequacy of Mr Weekes's may be inferred..." He did not agree either that the orangutan was, as the book suggested, the closest relative to man. He had found the chimpanzee's skull bore the closest resemblance to the human, so close that he seriously considered the possibility that Hottentots might be descendants. He had a great truth in his hands, but was too nervous or perhaps too cautious to see it. To Whewell he wrote of more reservations he had about **Vestiges**; "Animals in general cannot be arranged in a series proceeding from less to more perfect in any way, so many in different natural series being on par." he maintained. As for the embryonic evidence "much less can they be so arranged as that the more perfect in their foetal condition pass through the successive stages of the less perfect, the characters being taken from the brain to the heart."

This was calm and sensible criticism, quite different from Adam Sedgwick. A letter Sedgwick wrote to Whewell at this time exhibits the desperation of the cornered animal. "I do from my soul abhor the sentiments and I believe I could have crushed the book by proving it base, vulgar in spirit, false, shallow,

worthless, and with the garb of philosophy, starting from principles which are at variance with all sober inductive truth. The sober facts of geology shuffled, so as to play a rogue's game, phrenology (that sinkhole of human folly and prating coxcombery) spontaneous generation, transmutation of species and I know not what all to be swallowed without tasting or trying, like so much horse physic. Gross credulity and rank infidelity joined in unlawful marriage, and breeding a deformed prodigy of unnatural conclusions. And what shall we say to his morality and his conscience where he tells us he has "destroyed all distinction between moral and physical", when he makes sin a mere organic misfortune? If the book is true, the labours of sober induction are in vain; religion is a lie, human law is a mass of folly and a base injustice, morality is moonshine, our labours for the black people of Africa were works of madmen and man and woman are only better beasts." The "foul book" had filled him with "inexpressible disgust." He continued to rant against it in his lectures and letters for the rest of his life, and greeted **Origin of Species** with the same disdain

There were more scholarly and less prejudiced pronouncements of course. One of them came from Lyell. Lyell was at first sceptical, but finally a convert and he pondered which of the two theories of creation best answered critical questions; progression or transmutation. "We usually test the value of a scientific hypothesis by the number and variety of the phenomena of which it offers a fair or plausible explanation. If transmutation when thus tested has decidedly the advantage over progression and yet is comparatively in disfavour, we may reasonably suspect that the reception is retarded not so much by its own inherent demerits, as by some apprehended consequences, which it is supposed to involve, which run counter to our preconceived notions." More simply, new ideas were hard to accept, even if they fitted facts better than older ones, especially if the new paradigm was awkwardly unpalatable.

Because it ran into twelve editions; "ran" not altogether an accurate way to describe Robert's competent handling of the book over the years; it was assumed that he made a lot of money out of it. This was not the case. Except for the two cheap editions, the runs did not exceed a thousand copies, and after the fourth Robert noted that he had only made £200 out of which £185 had to go to the printer. Nothing came in from the fourth and fifth editions he complained, and after two years he was several hundred pounds out of pocket. After the fifth printing he told Ireland the book was "pretty well done with," but something changed his mind about letting it drop. There was a revised edition, an illustrated one, and a final printing a year after the appearance of **Origin of Species**. "The long cloudy sky of the opus seems now to be beginning to clear in a very decided manner" Robert wrote with Darwin's triumphant vindication of his thesis. He had never himself shifted an inch from his conviction, and for sixteen years doggedly went on trying to convince everyone else.

He continued to be extremely touchy about secrecy; quite why it is hard to say, since a great many people seemed to know the truth. The only sharers of the secret were Ireland, David Page his assistant editor who helped with the text, Dr Noel Arnott a friend and Robert Cox another close friend, George Combe's son in law, and of course William. When Page left the firm after a disagreement, and moved to the Dundee Advertiser, he produced an article revealing his name, which according to his diary made Robert feel extremely upset and depressed. This was ten years after the appearance of the book, and Page repeated the information to the Athenaeum a month later.

The article in the Advertiser is worth quoting in full, because it reveals how strong were the emotions

roused by that wicked name "Vestiges"; how earnestly David Page denied any association with its ideas; how he accused Robert of moral cowardice in not admitting its authorship from the start, which would have saved him from having to make his present "confession", proving to his distinguished audience his innocence as it were. Page was no mean scholar, and went on to become professor of Geology at Newcastle. It is possible he would have kept quiet if the subject had not been raised, but it was a petty act of revenge to pass the news on to the Athenaeum, a paper much more widely read than the Dundee Advertiser.

Page was giving a lecture under the auspices of Dr P. Anderson, who had written "Course of Creation" to counteract the "injurious tendency of the "Vestiges", and who in his chairman's speech alluded to rumours that David Page was in some way connected with that book. "In noticing the allusion of the chairman, Mr Page begged to state most emphatically, and without a shadow of reservation that he was not at all, or in in any way, responsible for the facts or opinions of the work in question. At the time the "Vestiges" was published, he was engaged as one of the literary and scientific collaborators of the Messrs Chambers; and it so happened that it was in circulation for several weeks before he had seen or read a line of it. The first time he saw it was in the hands of Mr William Chambers who came into his room one day with the remark "here was a curious work making some sensation" and requesting that he (Mr Page) would write a notice of it for the Journal (Chambers Edinburgh Journal). For this purpose Mr Page took the work home, and he had not read twenty pages of it when he felt convinced that it was the production of Mr Robert Chambers. Mr William Chambers received this announcement with apparent surprise, but denied all knowledge of the matter, and here the subject dropped. Sometime after, however, and when the work was being severely handled by the reviewers, Mr Robert Chambers alluded to the matter, affecting ignorance and innocence of the authorship, upon which Mr Page remarked that all he could say was, that had he seen the sheets before going to press he perhaps could have prevented some of the blunders on which the reviewers were founding so much of their opposition and argument. The consequence of this remark apparently was, that some time after Mr Robert Chambers sent him the proof sheets of the second or third edition of the "Vestiges" with the request that he would enter on the margin any corrections or suggestions that occurred. This he did; and since then he had not seen or read a word of the many editions through which the work had passed, unless the preface to the last illustrated edition, the tone and spirit of which he would not venture to (word illegible) as he felt they ought to be (illegible) and condemned. In reading the proof sheets he (Mr Page) had done no more than what many men were in the habit of doing for others, and what he had himself recently done for Dr Anderson's "Course of Creation" - a work avowedly written to counteract the erroneous elaboration (sic) and injurious tendency of the "Vestiges". Page finished by wishing Robert Chambers had spared him "this somewhat painful and unpleasant explanation." "He himself had never written a line which he thought shame to avow, or entertained a sentiment which he was afraid to utter; and it would have prevented much annoyance and injury to others had the author of the "Vestiges" proceeded upon the same (illegible)"

Robert's reactions to reading this report were justifiably angry, embarrassed and worried. Not only did his identity now become more than a suspicion but a fact, but also he was accused of hiding behind anonymity to save his own skin, to shield himself from the "shame" of association with such a scurrilous work. and in the process to injure the reputations of others (including presumably Prince Albert) who were named as its author. David Page expressed in the article the fear and loathing that, ten years after

its appearance, the word "Vestiges" could arouse and the necessity of a man of high morals and academic ambition to disclaim any connection with such a dangerous and despised work. It was almost as if he felt infected by even his brief brushes with it.

In the event the only slight threat seems to have been to the Educational Course, when some Free Church ministers tried to ban its volumes from their schools. The firm suffered not at all from well founded suspicions that one of its editors was the notorious Vestigarian. Robert's extreme sensitivity about revealing his identity is hard to explain, especially after the publication of **Origin of Species**. It could have been that those taunts, "parvenu", "straw giant" really hurt, and that he could face the world more securely if suspicion did not become fact. According to Professor Lovejoy, for years scholars had put about the impression that to be a Vestigarian was to be "unscientific and sentimental and absurd." It almost seems as if Robert was afraid that such epithets, though undeserved, might stick.

So the question has to be asked; how important was the book; would it have mattered at all if it had never been written? And the answer has to be another question; if Darwin had not produced a greater work; better researched, scientifically more accurate, with a brilliant insight Robert had missed in the process of natural selection; would **Vestiges** have been allowed to shine more brightly for a longer period, before being eclipsed, outshone, and forgotten about? There is no doubt at all that Darwin's work "owed" nothing to Robert's, except perhaps a warning not to rush into print before collecting a vast amount of data and checking and rechecking it. There is equally little doubt that someone else would have followed the great chain of being to its logical end; in fact someone had. Wallace would have replaced Darwin as the man whose name everyone remembered for finding the great Key that unlocked the mysterious door of transmutation. And Wallace set out on his journey of discovery after reading **Vestiges**.

Extracting the hypotheses, in plain language wild guesses, that Robert inserted into his text about spontaneous generation, based on the work of such as Mr Weekes of Sandwich, **Vestiges** did succeed in setting out in clear, readable language, the evidence for evolution over great periods of time. He did not identify exactly how or why the changes occurred that propelled some species forward while others remained unchanged. He allowed God only an initial interest in the enterprise, after that natural laws sustained the living world. Evidence could be found in bone and shell, tooth and ear, fish scale and foetus. Man, at the head of the simian line, might not be the end of the story, and out in space similar tales were likely to be told.

Darwin, like La Place, did not feel the need for first causes; the Frenchman remarked of God "Je n'ai pas besoin de cet hypotheses" and left it at that. Robert had to be more circumspect because he was writing in a country still under the shadow of a grimly conservative church. How much he really believed the sweeteners he inserted into his text must be speculation. In a memo entry of 1857 he confided his feelings then on the nature of God as he saw it.

"Some of the worst proceedings in history have been professedly done for the glory of God - the greatest of our social tyrannies, the enforcement of Sabbath keeping - is all out of a regard for God as if He had some interest in the matter..Is it too ludicrous to ask, would God be any worse off if mankind should cease thus to patronise him? It may be legitimate to surmise that in that event mankind

themselves would be a great deal better off, the truth is God is properly an object of reverence and awe but not of any moral feelings. A duty towards Him is an absurdity. A correct system of ethics only involves our mutual relations towards each other...It is impossible to put God into this relation towards us: ergo He is beyond the range of morality and such being the case to attempt to enforce upon each other supposed interests of His is a sure way to produce mischief as experience amply proves."

Here Robert has an aloof Jehovah figure in mind, "beyond the range of morality" and beyond the machinations of the church, who presume to be His spokesmen. By the time he wrote these words he was a confirmed spiritualist, with a belief in interlocking worlds, of a continuum of life forms, living and dead, only divided by the most fragile of veils. And above and beyond it all the awe-inspiring One with little personal interest in the worlds He has created, and certainly not in such trivialities as how to spend Sunday. With this in mind the many soothing epithets applied to God in **Vestiges** must be treated as tactful lipservice to the more imminent, accessible and concerned God of his readers.

Because the implications of the book were those that Adam Sedgwick had laid out; the Bible and its teachings had to be rethought, and the authority of the church on immense questions such as original sin, immortality, man as image of God had to be discarded. Thus the whole moral framework of the nation, so long structured and supported by the church's teachings, was under threat. The old certainties about obedience and guilt and punishment were wavering under the onslaught, and since the moral order was closely intertwined with the political, what messages of rebellion and repudiation might not the "masses" allow themselves to hear? The French Revolution was still in people's minds, and the forties was the period of mobs and strikes. Robert's news was the last that anyone wanted to hear, particularly the church after the disruptions of the secession.

If he had spent a little longer pondering the facts, Robert might have stumbled on the Key lying there amongst them; he came very close when he wrote in 1852 "the select of their generation survived" because he only had to ask himself what was the process of selection? For both Darwin and Wallace, Malthus was the catalyst; pressure on resources meant some species must either adapt or disappear. They could not voluntarily "choose" to change, so a chance adaptation gave some an advantage passed on (in ways not fully understood) to their offspring. Giving this the name Natural Selection did not, said Romanes, accurately describe the process. A more exact name for **Origin of Species** should have been "The Origins of Organic Types by Means of Adaptive Evolution", since the word selection implied a voluntary act that was not anywhere to be discerned.

All of them would have been greatly relieved to have had Mendel's studies on inheritance to hand; without it they were floundering, but Darwin's deductions were based on long years of study on hybrid plant experiments and animal breeding, whereas Robert saw effects to which he could not accurately pin causes, so he had to guess. However as William Smith wrote, "Man must throw some wild guesses into the air..." His were sometimes too wild, and this left him open to the scorn of men who soon knew he was no professional, and who resented him poaching an area that he had no right to be on. As the years went by he became friendly with many of them; with Canon Buckland who thought God had specially placed coal seams near water power in England, to give His favourite a head start in the industrial race; with William Carpenter and Charles Lyell whose homes he often visited; not with Adam Sedgwick, though they met at British Association meetings and when Robert reviewed *Origins* he

summoned the courtesy to call Sedgwick a great geologist; which in most respects he was.

Another critic of the book was Hugh Miller, who gave a series of lectures gathered into a book of his own which outsold both **Vestiges** and Darwin, "Testimony of the Rocks." Miller's origins were even humbler than Robert's; the son of a poor crofter he had begun his working life as a stone mason, and from there worked his way up to being a much respected geologist, folklorist and editor. The Chambers had given him openings in the **Journal** and Robert liked and admired him, though he found this book both irritating and absurd. It was hard for Miller, editor of the Free Church "Witness" to come to a resolution of the versions of the creation story offered by his hammer and his Bible. His lectures tried to do this, both for himself and his anxious flock, and they did most beautifully reconcile Genesis with geology, to his own satisfaction and to the relief of his readers. They did this in such majestic language that they read like new chapters of holy writ, and it is no wonder everyone loved them.

For days in the Biblical story, Miller substituted periods; the Azoic, the Silurian, the Carboniferous, , the Permian, the Triassic, the Oolite, the Tertiary. He placed Moses in a desert, watching a drama in which the curtain rose and fell for each of the geological periods. As he sat there, a great darkness moved in on him "and the Divine Spirit moves on the face of the wildly troubled waters, as a visible aurora enveloped by the pitchy cloud, and the great doctrine is orally enunciated...let there be light, and straightway a gray diffused light springs up in the east and casting its sickly gleam over a cloud-limited expanse of steaming vaporous sea, journeys through the heavens towards the west. One heavy sunless day is made the representative of myriads, the faint light waxes fainter,- it sinks beneath the dim undefined horizon; the first scene of the drama closes upon the seer; and he sits awhile on his hill-top in darkness, solitary but not sad, in what seems to be a calm and starless night."

Day by day the drama unfolded for Moses; on the third day "there springs up at the Divine command a rank vegetation". On the fourth day "The earth would have been a vast greenhouse covered with smoked glass, and a vigorous though may hap loosely knit and faintly coloured vegetation would have luzuriated under its shade." On the fifth day "gigantic birds walk along the sands while birds of a lesser size float upon the lakes. And ocean has its monsters.. monstrous creatures, armed in massive scales, haunt the rivers or scour the rank flat meadows." At the end of the sixth day "man, the responsible lord of creation, formed in God's own image, is introduced upon the scene." Man is "the being in whom the types meet and are fulfilled" the others preliminary sketches so to speak. God in this vision took Moses back and showed him the stages of creation; Hugh Miller supplied the gloss that geological epochs were intended by days, human and divine time being in any case relative.

Even in this final and most perfect creation there were signs of God trying out His hand, starting with "diminutive Laps. squat, ungraceful, with their flat features surmounted by pyramidal skulls of small capacity", and the "negro tribes with their sooty skins, broad noses, thick lips, projecting jaw bones and partially webbed fingers" and so through Hottentots, Bushmen, Fuegians and Mongolians, all "lapsed" from the ideal Caucassian type, and bound to become extinct, botched efforts. To their company must be added the Irish, "pot bellied, bow legged, abortively featured"; Miller in all this was expressing views with which Robert and Darwin would have agreed. Evolutionary theory both condoned and vindicated the current belief in the supremacy of white Europeans.

In his sixth lecture Miller had Satan watching the whole scenic display, and also part of it, having the same ability as God to move back and forth in time. "With what wild thoughts must that restless and unhappy spirit wandered amid the tangled mazes of the old carboniferous forests. And how he must have dreaded the arrival of man." As a Free Churchman Miller's belief in the devil was almost the strongest part of his faith, and he could not be left out of the story. Miller went on to deal with the Ark, not easy, and with the Flood that was strangely selective, burying now one group of plants and animals and now another. He ended these difficult speculations with the assurance that this theory of periods instead of days "will be found in an equal degree more worthy of its divine Author than that which would huddle the whole into a few literal days."

This beautiful nonsense was an expression of firm belief, and was shared by those whose faith in the Bible simply had to stretch to accommodate the fossil evidence. In his last chapter Robert faced some of the moral problems that his theory threw up; that of a God who set creation moving and then watched it suffer for instance; or arranged for a sex passion that led to over population and "occasional discrepancies between the laws operating for the multiplication of individuals and the laws operating to supply them with the means of subsistence"; for occasional discrepancy read famine and war. Disease seemed to be another mistake of someone supposed to be "transcendantly kind", and the best he could really offer was that it would all come right in the end.

His book had shown everything as part of a Great Progress "Thinking of all the contingencies of this world as to be in time melted into or lost in the greater system to which the present is only subsidiary, let us wait the end with patience, and be of good cheer." A slightly shaky millenarism sustained him, and he hoped it would do the same for his readers. Apocalyptic vision could supply a raft across the troubled waters of his theory; more than a theory, an absolute conviction which he felt it his duty to share with the world.

As he put down his pen, he was in better cheer personally than when he had started to write. The last chapters were posted off to Ireland when he was back in Edinburgh, restored to health and excited by the thought of what all those scholars to whom he had sent free copies would think. He was bringing the century's most astonishing news, and though he modestly presented it as a hypothesis merely, he was sure they would recognise the vast import of the facts behind the guesses.

Once they had done so, he was ready to "come out" and be given the congratulations they could not withhold, even from Robert Chambers the Scottish publisher who was quite presumptuous to have even attempted the work. Instead they one and all rejected **Vestiges**, though it must have planted seeds of disquiet in many of their minds. Generally its reputation became so bad that when Darwin wrote to a friend about his own discoveries, he asked him not to pass on the information in case the author of **Vestiges** got hold of it and used it in one of his editions, thus debasing it.

Wallace was the shining exception to the chorus of contempt. "I do not consider it a hasty generalisation, but rather an ingenious hypothesis strongly supported by some striking facts" he wrote in 1845 when all the other voices were at their most strident. Two years later he confirmed his admiration. "I believed the conception of evolution through natural law, so clearly formulated in the "Vestiges", to be as far as it went, a true one." He then set out on journeys to take him that little further. Others had

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the roads of their lives turned in new directions; Spencer, Schopenhauer, Emerson and Tennyson. And page 384 of Darwin's **Origins** produces so many "probables" as to make his great work concede the need for inspired guesses too.

Professor Lovejoy points out that once uniformitarianism was accepted, the evolutionary road was the obvious one to follow. "It was left for an anonymous amateur whom they thereupon with one accord fell to abusing, to point out the practicability of that highway" and as they all began to hurry along it, they produced arguments "which had been clearly pointed out by Chambers in the middle forties." Very firmly, and I think accurately, Lovejoy concludes; "Hardly has any advance since been made on Chambers general arguments, which at the time they appeared would have been accepted as convincing but for the theological truculence and scientific timidity...The considerations that now recommend evolution to popular audiences are no other than those urged in the "Vestiges." What a pity David Hume was not around with his brand of gentle scorn ready to scatter on the men of the cloth and of science who were unwilling to reposition themselves in what, for him, would have been an easy and obvious movement.

In spite of the taunts and the neglect, Robert never lost faith in his theory, and was finally vindicated. He consoled himself by remembering how often in history revolutionary new ideas had been dismissed. As Nietzsche put it "In England in response to every little emancipation from theology, one has to reassert ones position in a fear-inspiring manner as a moral fanatic." The bitter pill - that man had no special place either in God's affections or in world history - was an emancipation especially hard to swallow. The second half of his century was dedicated to efforts by all Europe to make this huge paradigmatic leap. He would have been amused to know that twentieth century throats have not altogether managed to swallow the pill, and that pronouncements on the subject are still the stuff of Papal edicts. Mankind, now as then, cannot bear to relinquish its place as the centre and culmination of creation, with the right to strip the world of anything that stands in the way of its arrogant and short sighted needs.