

**SIR FRANCIS BACON  
AND THE  
GEOLOGICAL SOCIETY OF LONDON**

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CANADA**

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**ABSTRACT**

The historical relationship between Francis Bacon and his method of interpreting nature, the Royal Society of London and the Geological Society of London is reviewed. The Baconian method is described, its deficiencies noted and the fact that both the foundational work for geology and Darwinian evolution has slipped between the cracks of the Baconian method explained.

**INTRODUCTION**

There were two Bacons in the history of science, both were Englishmen, both wrote in cipher and both were concerned with the method of conducting science [20],[21]. The first was Roger Bacon, a thirteenth century scholar. His principal contribution to history was the translation of the scientific works of Aristotle from the Arabic into Latin. Roger Bacon was thus largely responsible for introducing Greek thinking into the Judeo-Christian West [5] but he also conducted many experiments and wrote briefly on the experimental method [5, 2:583]. The second was Francis Bacon, a sixteenth century scholar. However, unlike his namesake he practiced little and wrote much about experimental science. It was this Bacon, England's Lord Chancellor, who gave later generations the Baconian or Scientific method which laid the foundation for all scientific endeavor today.

**The Life and Work of Francis Bacon**

Francis Bacon is one of the most intriguing personalities in history and many biographers have spent years piecing together the details of this man's life. Historian James Spedding produced a seven-volume work on the life of Francis Bacon in 1861 and this has subsequently become the orthodox account. However, other researchers since that date have unearthed more material and the mystery surrounding Bacon's life and silent years have slowly been revealed. It is a remarkable story.

Princess Elizabeth Tudor came to the throne of England as Queen Elizabeth I in 1558. Within weeks of being made Queen, she arranged to have Lord Robert Dudley as her personal guard at the palace. Elizabeth soon found herself "with child", and it was arranged to have Dudley's wife, Amy Robsart, quietly murdered leaving the way clear for Elizabeth and her lover to be married in a secret ceremony within the same month. Thus, legitimized by the marriage and technically heir to the throne, the babe was born in 1561, named Francis and raised by Lord and Lady Bacon at York House in the center of London. Throughout her long reign Elizabeth encouraged her unofficial title of "The Virgin Queen", but the political climate never permitted her to acknowledge Francis as her son, and heir to the English throne [11].

This is the very stuff of historical romance and, whether we accept it or not, there does appear to be good circumstantial evidence for its support. Certainly there is more to the official biography of Francis Bacon than we have been given to believe. But this is only the beginning of the Bacon story because Elizabeth's reign was wreathed in international cloak-and-dagger spy networks and double agents with their cipher messages. The root cause of the unrest in Europe, the "Thirty-years" War, the "Hundred Years" War, the civil wars, was religion. The conflict lay between the Church of Rome and the Bible-believers, later the Protestants; each considered the other to be heretic and set about to put the good Lord's Kingdom in order by the sword and the flame. The Roman Church in particular had assumed far too much power and had become arrogant and corrupt; this would later

happen to the Protestant Anglican Church. Superstitions and traditions had become entrenched as divine truth and many sincere Christian men began to regard the formal Church as the bastion of ignorance and intolerance. For example, the Church forbade dissection of cadavers, arguing that this would "spoil the resurrection", the result was a general ignorance of anatomy by the medical profession. Many intelligent Christian men therefore sought a complete Church "house-cleaning" but it was extremely dangerous to say so publicly. One such group, calling themselves "Rosicrucians" formed secretly in Germany, and Francis Bacon is known to have been very closely associated with this organization throughout his life. The early Rosicrucians sought reform of the Christian Church and had an earnest desire for genuine wisdom and knowledge through science. However, over the centuries the Rosicrucians became badly side-tracked in seeking the wisdom of the ancients, specifically the Egyptians. Historian Francis Yates documents this in detail [30].

It would be beyond the context of this paper to retrace the steps from the Rosicrucians to Freemasonry to the present political trend to one-world government. Nevertheless, there is no question that it was the genius of Francis Bacon which laid the foundation for this humanist ideal. Bacon's followers were inspired by Plato's Republic which proposed a Utopian World free from war and ruled by wise men. Plato had seen that every then-known ruling system was corrupt but he piously thought that wise men would be beyond corruption. Every republic formed since the French Revolution should be living testimony that power corrupts. Bacon was a profound writer and is best known for his Magna Instauration which first appeared in 1605. The title is most often translated as "The Great Instauration" which tells the reader little, but occasionally the more insightful "The Great Restoration" or even "The Great Renaissance" is used. Bacon's final and unfinished work was The New Atlantis which has for its subtitle The Island of Bensalem or the Land of the Rosicrucians. Bacon died in 1626 and this work was published posthumously in that same year.

### **The Baconian Method of Science**

Scientific enquiry, such as it was until the sixteenth century, had been based upon a Christian world-view where the Scriptures were taken as the first authority. Jones [17] has presented a very clear case to show that the Christian view at that time included the belief in the Edenic curse and the continuing Fall of Man; for this reason, the Greek writers living almost two thousand years earlier were considered to be far wiser than scholars of the Middle-Ages. Accordingly, the interpretation of Nature was based upon Scripture and the writings of the "Ancients", that is, Galen and Aristotle. Many of the explanations of these writers were simply based upon syllogisms, yet these authorities were held in esteem almost as great as the Scriptures themselves. Bacon, and other writers of that Elizabethan period, could see that this approach led to plain nonsense and he proposed turning from the past and looking to the future with an empirical approach. This was actually the turning point which led to the current belief in the "Progress of mankind" while it was done with the lofty appeal to "the betterment of man".

Francis Bacon realized at a very early age that in some areas, for example philosophy, the Greeks were very insightful but wordy arguments contributed nothing to the understanding of nature. He realized that careful observation and experiment were necessary such that the data could be received directly by the five human senses. He first published his views on this very cautiously in English in 1605 in the Magna Instauration: here he suggested that the study of natural phenomena begin by first clearing the mind of all previous preconception. Here he was referring to the abandonment of the Greek philosophers and particularly Aristotle and, while he did not say so, Scripture would also be abandoned. As we shall see, it is humanly impossible to "clear the mind" and human reason will quickly enter the vacuum left by Scripture and the "Ancients". It was in this way that Bacon unwittingly laid the foundation for humanism. In 1620 he added the Novum Organum (New Instrument) as the second part to the Magna Instauration. In this, he set out more specifically his proposed method of conducting scientific investigation by "Inductive reasoning". This is presented in a series of aphorisms in Book Two of Novum Organum. Finally, and in bolder terms, an expanded version of the Magna Instauration was written in Latin and published in 1626 under the title De Augmentis Scientiarum. This was translated into English and published posthumously by Bacon's followers in 1640 under the title The Advancement of Learning.

Bacon's method for the interpretation of nature and the study of natural phenomena thus begins with the interpreter of nature first dismissing from his mind all prejudice and preconceptions; he referred to these as "idols of the mind". He then described three main steps: The first consists of a careful and methodical observation of as many facts as possible. The second step is the tabulation of all the facts into three groups, those that influence the property under investigation, those that do not and those which cause only a partial influence. The final step is a process of elimination whereby all those observations having no influence on the phenomenon under investigation are rejected. When only a single set of conditions remain, this is held to be the first approximation of the truth, or, as Bacon put it, in Aphorism 20, "the first vintage". Bacon's method of induction works by the process of elimination or, as we say today, "falsification" or "refutation". The method is just the reverse of Greek thinking which often began with a defective tradition and added observations which seemed to support it.

Bacon was sternly opposed to theorizing, yet sensibly recognized that another step was necessary which he called "Indulgence of the understanding". We would call this today "a working hypothesis". When investigating a natural process, this is simply an intuitive notion suggesting how the process might work. Ideally, experiments are then

set up to try to refute or disprove the hypothesis; if the hypothesis survives the tests, it is then raised to the status of a theory. If the theory can be extended to a very wide range of phenomenon and not one observation is ever found to refute it, it then becomes a Law. Very few theories ever achieve this status. Bacon's "art of interpreting nature" was thus one of step-by-step elimination of possibilities. Automobile mechanics and television repairmen exercise this mental process daily, and never think to ascribe the cause of malfunction to malignant spirits or a curse of the gods. The scientific method has thus freed man from much superstition and scientific progress has undoubtedly been made far beyond anything Francis Bacon would have dared to hope. However, before we examine the subtle deficiencies of the Baconian method we need to see how it was promoted.

### The Royal Society

After Bacon's death in 1626 his friends continued to publish his works but of particular interest is the fact that it was the Puritans who gave his work most support [17, p.87-113]. Their justification was based upon Bacon's advocacy of turning away from the "Ancients" who were recognized by the Puritans to be pagan. By 1645 a little group of like-minded individuals was meeting at Dr. Wilkin's lodgings in Wadham College, Oxford, for the purpose of laying the foundation for "all this that followed", while the University at that time had "many members of its own, who had begun a freeway of reasoning". This is the arcane language of Thomas Spratt, early president of the Royal Society in his *History of the Royal Society* [27, p.53]. By "all this that followed" he meant the outworking of scientific investigation according to the method set out by Francis Bacon, while those with a "Freeway of reasoning" were what would be later known as "liberal thinkers". This group, consisting mostly of intellectuals, formed themselves into what they called the "Invisible College" which met at Gresham College, London. Robert Boyle, the discoverer of the gas laws, was at this time an influential figure. The "Invisible College" finally received a Royal Charter from King Charles II in 1662 and could at this time adopt the more formal name The Royal Society of London.

The evidence for Francis Bacon's method as the actual foundation for the Royal Society of London is compelling. Not only does Dr. Spratt [26, p.35] pay deference to Bacon in this respect but Abraham Cowley acclaimed Bacon by name in an ode recited at the Royal Society referring to him as "...the Moses who led us forth from the barren wilderness to the land of experimental science ..." [27, Preface, not paginated]. Further evidence is found in Bacon's *New Atlantis*. This short book is a fictional account of an island state located in the North Pacific, ruled benevolently from Solomon's House by a priestly caste of Experimental Scientists divided into thirty-three secret orders. Careful reading, however, reveals that there are actually thirty-six orders, the last three being the most secret "Interpreters of Nature". Even the casual observer cannot help but note the similarity between this description and modern Freemasonry with its Solomon's Temple and thirty-three degrees, and as one descends to details the similarities go far beyond mere coincidence. Not too much digging is required to show that the early leading members of this College, and later the Royal Society, were either Rosicrucians or Freemasons. We know them by name and association: Sir Robert Boyle, Elias Ashmole, Sir Robert Moray, John Locke and later Sir Christopher Wren and possibly Sir Isaac Newton to name only a few. Joseph Glanville writing in 1665 commented that Lord Bacon's "Solomon's House in the *New Atlantis* was a Prophetik Scheam [sic] of the Royal Society" [27, p.xii]. Modern historians such as Alfred Dodd [11, p.166], Sir Harold Hartley [12] and Marjery Purver [24] have restored much of the truth about the connection between Francis Bacon, the Royal Society and Freemasonry. Francis Bacon was thus regarded by the Royal Society as their Messiah who by the enlightened scientific method would lead the world into a new order based upon human rationalism rather than superstition.

The universities of England in the sixteenth century were dominated by the Anglican Church which insisted that nature be interpreted by Scripture. The Church authorities thus viewed the Royal Society with suspicion. The relationship was not helped by the fact that Roman Catholics were sometimes welcomed. The Royal Society was unconcerned with its members beliefs as long as they adhered to Christian moral principles and their concern was the genuine pursuit of knowledge. It may be appreciated then that the Royal Society tended to keep its motives secret and to adhere rigidly to Baconian principles, reporting only the facts, drawing the most conservative conclusions and never theorizing in its Proceedings. Finally, a quote from Alfred Dodd will help to bring Bacon, the Royal Society and Freemasonry into sharper focus:

The universities had never realized that The Great Instauration was something even greater than the writing of a series of books. It was the actual establishment of groups of men that labored along certain secret lines which led to a real revival of learning and the liberalizing of Theology, culminating in the exoteric Royal society on the one hand and the esoteric Temple of Solomon [An inside nom de plume for Freemasonry] on the other. [11, p.166]

### The Geological Society of London

The year was 1799 and the Republic which had dechristianized France eighteen years earlier was barely a memory in the minds of London's rising generation of society gentlemen. George Greenough was such a gentleman. At 21, independently wealthy and well educated, he and like-minded friends met regularly for dinner at the Freemason's Tavern in Great Queen Street, central London. Their consuming mutual interest was the mineral deposits of the British Isles, but this was from more than mere academic curiosity. The Industrial Revolution, then

in full swing, was driven by steam and steam was generated by coal. It followed that there was a rising demand for good coal and metallurgical minerals, with great rewards for those who could find and claim them. Young Greenough organized his friends into a formal dining club limited to forty members; at fifteen shillings a head for the dinners this excluded anyone who actually worked in the mineral and coal industry. Thus, The Geological Society of London was hatched over pots of ale in the back rooms of the Freemason's Tavern in the year 1799. Its purpose was a gathering place for geological information while financial gain cannot be excluded as its motivation. Greenough was the Society's first president.

Gathering, summarizing and issuing information meant that the Geological Society required a permanent meeting place and a paid secretary. The Society found its first home in rented rooms at Somerset House just four minutes walk from Freemason's Tavern, and the first volume of the Transactions was issued to its members in 1807. Somerset House had been the home of the Royal Society since 1782 while some of its members were also members of the fledgling Geological Society. Sir Joseph Banks had been the autocratic president of the Royal Society since 1778, and also became a member of the Geological Society, one suspects, in order to keep an eye on its activities. The Royal Society made all official pronouncements on science in Britain and its president would brook no rival. Moreover, the scientific method was sacrosanct and not to be degraded by theorizing. Interestingly, the front cover of the early issues of the Geological Society Transactions contained a quote in Latin from Bacon's Novum Organum to that effect. The activities of the Geological Society were very subdued until the 1820's when several things happened which caused geology to be put on the map. Firstly, after forty-one years of iron-handed rule over the Royal Society, Sir Joseph Banks died in 1820. Five years later the Geological Society received its Royal Charter giving it almost equal status with the Royal Society whereby its members could be called "Fellows". The tension which had existed between the two Societies was now relaxed and all the leading members of the Geological Society became members of the Royal Society. Secondly, the forty-member Geological Society dining club which had always been an inner sanctum controlling the activities of the now much larger number of ordinary members, was being replaced by younger men with an urge to theorize. It was at this time, in 1823, that the young Charles Lyell became the Geological Society secretary and corresponding foreign secretary. From this point on, the Baconian restriction against theorizing began to crumble.

### The Theorizing of Geology

Prior to and following the French Revolution of 1789, Paris was the center of scientific learning. Baron George Cuvier had become the head of the Museum d'Histoire Naturelle and was one of the most influential men in science. He is generally regarded as the father of comparative anatomy and paleontology. Looking at cliffs and gorges, Cuvier observed that the rock strata were of different mineral compositions, while he correctly reasoned that each mineral layer had been deposited as sediment from water. He also reasoned that the fossils within the layers were the remains of creatures which were living at the time the sediments were laid down. He observed uniform layers of sandstone lying on top of limestone which in turn lay upon layers of shale and he found it difficult to believe that so many different types of sediment had been deposited by a single flood as described in the book of Genesis. Plain common sense told him that there must have been a number of successive floods, each depositing a layer of sediment which trapped within it representatives of the plants and animals living at that particular time. Cuvier reasoned that after the flood waters receded the sediments dried out, hardened into rock and even partially eroded before a subsequent flood occurred. He identified at least twenty-eight different kinds of sedimentary rock, (e.g. limestone, slate, sandstone etc.) and proposed as many floods to account for them [7]. This was known as the "Multiple Catastrophe Theory" and, according to this approach, the Genesis Flood was simply the last of a series of floods, and occurred five or six thousand years ago. It all seemed so reasonable.

Cuvier began to promote his theory in 1795, first in French, then a little later in English and at this same time the Scotsman, James Hutton, was promoting his theory of the earth in England more boldly in terms of millions of years. Hutton had gone to Paris to study science, picked up many of the ideas which were current among the university professors and students, and then had returned to Scotland. Hutton claimed that given enough time, the natural processes we see going on today could easily explain all the geological features that were then being ascribed to catastrophes of the past, namely the Genesis Flood. Hutton's explanation was not popular in his day because it did too much violence to the Biblical account, but his idea was carried forward a generation later by Charles Lyell and the Geological Society. The multiple-flood idea was at first thought to be caused by the sea level's rising and falling, but it was realized that this would mean simultaneous world-wide flooding. The notion quickly gave way in Lyell's mind to the slow rising and falling of great areas of land, even whole continents. Lyell found evidence at the Roman temple of Serapis to support his idea that it was the land rather than the sea which had risen and fallen. In this way, the floods were local and the flora and fauna could continue to propagate, eliminating the need for Noah and his ark.

Between the years 1830 to 1840, a revolution in the study of geology took place which involved Roderick Impey Murchison, the Reverend Adam Sedgwick and, to a lesser extent, Charles Lyell. Historian paleontologist, Martin Rudwick [26], has recently documented this era in geological thinking in fine detail and shows how the Society President, Murchison, along with his friends, Sedgwick and Lyell, sought to force a fundamental change in thinking among geologists. Prior to 1830, rock strata were referred to by names corresponding to their mineral content:

limestone, sandstone, etc. A decade later newly-coined names such as Cambrian, Devonian, Silurian and Ordovician were commonly being used. The new names were based upon the fossils of the flora and fauna believed to have been living during successive eras of earth's history. It was presupposed that life on earth began in very elementary forms and gradually became more complex, thus the expected fossil order was ranked from simplest in the lowest and oldest strata to the most complex in the uppermost and youngest strata. They do in fact often occur this way. Differentiation among rock types was now dependent upon the fossils found in them and had little to do with their mineral content. Murchison and his collaborators had adopted both Hutton's uniformitarianism (no-catastrophe) position and William Smith's fossil-based strata identification system. Smith was employed by the Somerset Coal Company to dig canals, and he had discovered a rule-of-thumb method of knowing rock strata by the fossils found in them.

Murchison's common-sense belief was that younger strata were always deposited on top of older strata. This is the principle of superposition and the key to modern stratigraphy. For example, the distinctive formation of red sandstone in Germany was at first correlated with a similar red sandstone formation in England because both formations were always found directly on top of the coal seams. But then it was found that in England red sandstone also lay below the coal strata, while in Germany there was no red sandstone beneath what was assumed to be the same coal seam. This finding was inconsistent with the principle of superposition and the problem was solved by proposing that in England there were actually two superficially similar formations of red sandstone. The upper one became known as the "New Red Sandstone" and was believed to be the same formation as that in Germany. The lower sandstone formation in England was then named the "Old Red Sandstone". The speculative notion of great periods of time was introduced by employing the words "Old" and "New" rather than "Upper" and "Lower". This served no other purpose than to justify the preconceived idea of how the sedimentary rocks were formed. Eventually, all rock strata were directly identified with ages in earth's history and thus was constructed a theoretical scale of time now referred to as "the geologic column". This entire scheme was introduced in the early 1800's, while Lyell's part was to use his legal training to argue the case providing evidences for an old earth and arguing down any potential objection [25]. All this work prepared the way for Charles Darwin and conditioned the public mind to accept his theory of evolution offered to the world in 1859.

### **The Baconian Method Re-examined**

Scientific investigation cannot yet be carried out without involving the human mind. Even with all the sophisticated instrumentation of today and statistical analyses of the results, the bottom line is that human nature is still involved. That is, in the initial stages someone has to decide which observations to gather and which experiments to make while in the last stage someone has to draw the final conclusions.

In his criticism of the Baconian method T. B. Macaulay, afterwards Lord Macaulay, questioned how the investigator would know when there is sufficient data, "Will ten instances do? or fifty?" [19, p.91]. The mathematician Augusta De Morgan was equally critical and pointed out that Bacon himself knew that a "thousand instances may be contradicted by the thousand and first so that no enumeration of instances, however large, is sure demonstration" [10, p.50]. This is something every investigator is aware of that every so often an anomalous result will show up for no apparent reason. However, human nature tends to "turn the blind eye" to this result even though this is dishonest. The literature shows that while most writers are supportive of the Baconian method, the few that are critical write with greater force of argument and professor of logic, W.S. Jevons [16, 2:134ff] is an example of one having great clarity of thought. In the matter of the method of induction, we find Adamson [1] slamming this hard in the *Encyclopedia Britannica*, the philosopher A. N. Whitehead [29, p.58ff] being highly critical while Morris R. Cohen [6, p.153ff] completely devastates the entire method. We should be reminded that these perceptive critics of the Baconian method are only those bold enough to appear in print while there is written evidence to show that they suffered a certain amount of persecution for their honesty.

The primary problem with the Baconian method was stated three centuries earlier by Roger Bacon. In his *Opus Majus* Roger Bacon listed the major causes of error in scientific investigation to be: Undue regard for authority, Habit, Popular prejudice and False conceit of knowledge [5, 1:3-35]. This would seem to be a remarkable insight for a thirteenth century writer, yet every word of it applies today. The Baconian problem is that it is a virtual impossibility first to clear away the "idols of the mind"; human nature does not work this way. At a very early age every human being develops a bias, a prejudice and eventually a preconceived world-view through which information from the world about us is filtered before it reaches our intellect. In practice, scientific investigation therefore begins with a theory or a hunch, sometimes based upon only one observation. Thus, the preconception or prejudice of the scientist has already formed the theory virtually before he begins the investigation and this then determines which observations will be made. This major drawback to the Baconian method is that it is an ideal to which human nature is opposed. In fact, some of the critics have even argued that no scientific discovery has yet been made using the method of induction.

A prejudiced mind is the most serious obstacle to genuine science and limits an investigation to operate within certain parameters thus rendering it a "closed system of understanding". As soon as any system closes itself this way, it is deprived of the power of self-analysis and therefore of self-criticism. A modern example is Radio-Carbon

age determination. The evolutionary mindset is conditioned to believe, for example, that coal and oil deposits are millions of years old. When Willard E. Libby developed the Carbon 14 method in 1948, coal, oil and fossil bone samples were submitted to Carbon 14 analysis and for the next twenty years the ages obtained faithfully reported; in every case, they were less than 20,000 years. These were not the ages expected and students have since been led to understand that the method is not usable for artifacts older than 50,000 years. This may well be true, but it means that when artifacts are pre-judged to be older than 50,000 years, the method will not be used. The buried forest recently discovered above Canada's Arctic Circle is a case in point where, although still fresh, the wood is believed to be 45 million years old; thus, the carbon-dating method will not be applied to it [4, p.28]. The result is that an age of just a few thousand years, which the method would and does, in fact, give for the buried wood, does not then become a falsification for the currently held theory of evolution. This is typical of a closed system approach and ensures that no data contrary to the preconceived interpretation can enter the equation.

The second problem with the Baconian method stems from the first and is again related to human nature; this time the problem is pride, although in the competitive world of research grants and university politics fear plays no small part. As Roger Bacon put it, "Undue regard for authority". The Baconian method demands that a concerted effort be made to falsify any hypothesis (or "first vintage") the investigator makes. However, unlike the television repairman who works by eliminating hunches, when the scientist has a hunch he tends to call it a "theory", entertain the prospect of kudos, perhaps fame and is inclined to look for evidence to support it, not refute it. In fact, the greatest mental discipline and integrity is required to actively attempt to falsify one's own theory. Successful falsification means that the investigator is then faced with having to acknowledge that his personal "brain-child" was stillborn. After, say a decade of work, this would call for a humility of character rarely found in any of us.

A third problem, not so much with the Baconian method but rather its practitioners, is that a theory must be refutable or falsifiable in the first place in order that the Baconian method may be applied. In other words, the theory must be able to make predictions which can then be tested. Sir Karl Popper [22] is generally held to be one of the greatest living philosophers of science and has been sufficiently forthright to state:

A theory which is not refutable by any conceivable event is non-scientific. Irrefutability is not a virtue of a theory (as people often think) but a vice. [22, p.36]

Popper [23] had in mind Darwinism when he wrote this and a decade later he was more direct, "I have come to the conclusion that Darwinism is not a testable scientific theory, but a metaphysical research programme—a possible framework for testable scientific theories." [23, p.168]. What he meant by this was that for a study to be "scientific" it had to be observable and repeatable while any theory had to predict events and thus be capable of refutation. Evolution, whether by Darwin's proposed mechanism or any other, fails to qualify on all counts as "scientific" since events of the past can neither be observed, nor repeated. Popper was under pressure from his peers to retract this damaging statement, and in a recent interview on his ninetieth birthday he was asked again about these conclusions but he did not retract them [14, p.20]. Another surprising conclusion of Sir Karl Popper concerned the term "induction". This is one of those words which are banded about often pompously while few have the temerity to ask what it means. Popper [22, p.53] gives the definition: "inference based upon many observations" and then points out that induction as a method is, in fact, a myth. As mentioned earlier, since it is a virtual impossibility to "rid the mind of idols" Popper observes that in the real world, scientific success is not based upon the rules of induction but upon luck, ingenuity and the purely deductive rules of critical argument. That is, the actual method scientists use is logico-deductive. In the worst departures from the Baconian ideal, conclusions are drawn after a single observation and the result announced as a "breakthrough"!

### **How the Geological Society Fell Through the Cracks in the Baconian Method**

Cuvier's Multiple Catastrophe Theory, Hutton's appeal to natural processes and Lyell's promotion provided today's explanation for every geological feature; it all seemed so perfectly reasonable. Theologians struggled in vain, compromised with various theories and eventually caved in to accept evolution as the all-pervading principle of earth history. Darwin had come and gone and his theory was becoming accepted both in England and Europe, especially in Germany. In Germany, Johannes Walther was a student of Ernst Haeckel and by the 1880's had become a well-traveled and well-known professor of geology in his own right. Walther was a keen observer of nature and particularly of the sedimentary rock formations and the fossils which they contained. He wrote a three-volume German work published in 1893-4 but this has never been published in an English translation and, in fact, is not at all well known [28]. This work contained what is referred to as "Walther's Law of the Correlation of Facies" [28, 3:974]. Working in the Bay of Naples, Walther observed that as the sediments carried by the river entered the bay, they deposited from the waters in a certain order according to the decrease in the flow rate: heavy particles dropped out first while the lightest particles were carried furthest. Since this is a dynamic process proceeding in the direction of the flowing water, the heavy particles soon begin to deposit on top of the previously deposited lighter particles. See illustration. Walther expressed it as follows:

The various deposits of the same facies areas and similarly the sum of the rocks of different facies areas are formed beside each other in space, though in cross-section we see them lying on top of each other. [28, 3:979].

As Walther himself says, this has far reaching significance though unfortunately his arcane way of expressing it and lack of any diagrams has left most readers unaware of his meaning and no idea of its significance. Some work is being done today under the name "sequence stratigraphy". Guy Berthault is a French sedimentologist and recognized well the significance of Walther's work. He devised some simple experiments whereby processes of sedimentation could be observed and repeated, two fundamental requirements for real scientific investigation. His work was formally reported at the Third National Congress of Sedimentologists in France and received with loud applause from the 350 delegates present [2],[3].

In summary, Berthault's work shows that the layers of sediment seen by Cuvier were not necessarily laid down vertically like carpets one upon another. Further, the vast ages of time said to be required for this to take place are quite unnecessary. By observation, the dynamic sedimentary process operates in a horizontal manner producing neatly separated layers, one on top of the other, simultaneously. The same thing has been observed in recent natural catastrophes and, taken together, this work offers the most serious challenge to the entire concept of the geologic column. Berthault's experimental work is for the most part so simple that it would have been quite possible for Lyell and the Geological Society to have done these same experiments. However, as the record shows, they did no experiments on sediment formation at all, but adopted a theory which most appealed to human reason; then further, by sheer force and not a little back-room manipulation, declared their "science" to be the self-evident truth.

### Did Darwin Follow the Baconian Method?

Both Charles Lyell and Charles Darwin behaved in the normal human way by beginning with an hypothesis based upon their preconceptions and selecting data or observations which appeared to give their support. Lyell used the Roman temple of Serapis, which has sunk below sea level in historic times then risen again, as major supporting evidence. On the other hand, they tended to ignore or rationalize away that data which did not support their ideas. All the work carried out to determine the thickness of flood deposits in the Nile delta could not give an age of more than 30,000 years, far too short a time for Lyell. He reported the work then dismissed it [18, p.26]. Darwin's primary departure from the scientific method was an overriding preconception that the Creation account was not true. In his letter of May 11th, 1863, to Asa Gray he confessed [9, 2:371]:

Personally of course, I care much about Natural Selection: but that seems to me utterly unimportant, compared to the question of Creation or Modification.

From very early in his investigations Darwin was biased toward "Modification" or, as we know it today, evolution. His theory was really based upon observations of slight changes among the living and speculations about major changes (speciation) among the dead, that is, the fossils. He lamented that there was no evidence of gradual change in the fossil record, but hoped that some might be found [8, p.280]. A moment's thought will show that since neither Darwin nor anyone else can observe events or the living creatures of the past, his interpretation had to be speculative and his theory not refutable. However, by sheer force of words in his writings, this speculation became elevated to a theory without observational support. To this day, that situation has not changed.

Darwin's second departure from the scientific method was almost sleight of hand and consisted of wordplays which allowed him to draw conclusions out of thin air. He suggested possibilities, adding one upon another, then spoke of probabilities and concluded with a virtual certainty. His description of the evolution of the eye is a classic example [8, p.186]. The rules of chance work in just the opposite direction: heaping possibilities one upon another makes an event less likely, not more probable. Science historian Gertrude Himmelfarb spotted this reversal of logic in Darwin's Origin and said he was, in effect creating a "logic of possibility" [13, p.334]. In Book One, Aphorism 125 of Novum Organum, Bacon describes the method of the "ancients", the Greeks, of which he was so critical, and his description is precisely that adopted by the Geological Society, by Darwin and hundreds of others since:

From a few examples and particulars ... they flew at once to the most general conclusions, or first principles of science; taking the truth of these as fixed and immovable [Darwin's belief in evolution], they proceeded by means of intermediate propositions to educe and prove from them the inferior conclusions; and out of these they framed the art [Darwin's Natural Selection]. After that, if any new particulars and examples repugnant to their dogmas were mooted and adduced, either they subtly molded them into their system by distinctions and explanations of their rules, or else coarsely got rid of them by exceptions, while to such particulars as were not repugnant they labored to assign causes in conformity with those their principles.

In a sense, the Geological Society of London and the Darwinian school had slipped back into "Greek science" by too quickly concluding with an hypothesis, then, using this as the Greeks had their faulty traditions, they looked

for evidence to support it. Not only that, but Lyell "subtly molded" geological sciences for half a century through the Geological Society while Thomas Huxley did the same thing later for the biological sciences through the British Association. In his address given to the Philosophical Clubs of Yale and Brown Universities in 1896, William James [15] spoke on the topic of the will to believe and pointed out that in a social organism each member does his duty with a trust that the other members will simultaneously do theirs. The Geological Society or the British Association would be a classic example of such a social organism. James had something like this in mind but gave as his example a train robbery. The handful of bandits get away with the robbery because they have faith and trust in one another to do his part whereas the trainful of passengers, who may be brave enough individually, do not have that faith and trust in their fellow passengers. He concludes:

There are then, cases where a fact cannot come at all unless a preliminary faith exists in its coming. And where faith in a fact can help create the fact, that would be an insane logic .... that faith running ahead of scientific evidence is the "lowest kind of immorality" into which a thinking being can fall. Yet such is the logic by which our scientific absolutists pretend to regulate our lives! (Emphasis in original) [15, p.25]

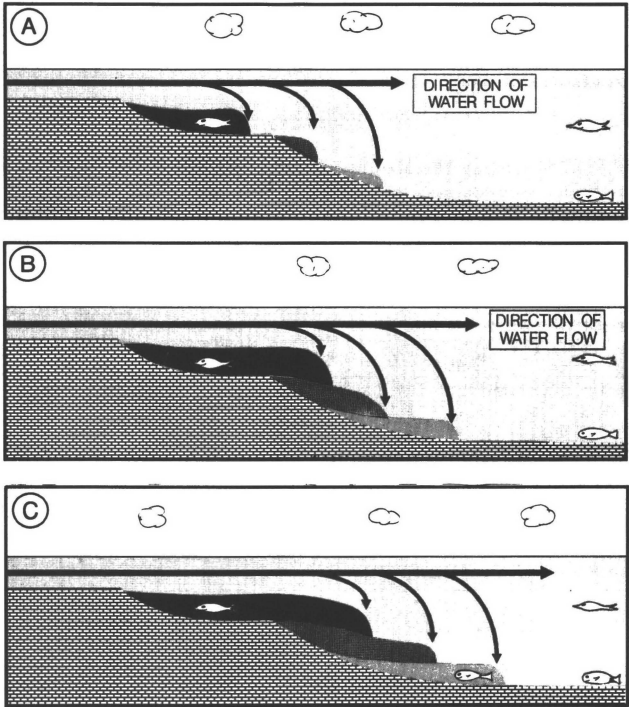
## CONCLUSION

The Baconian method is seen to be the dream of an idealist and virtually impossible for normal human beings to achieve. This is not immediately apparent, but it is for this very reason that mankind in general, including the scientific community, has been deceived into thinking that the pronouncements of science are based upon totally objective work. The theory of evolution especially has failed to meet the Baconian ideal and long ago reached the point among those wishing the theory to be true where faith has helped to create the facts. From the time of the French Revolution the liberal spirit has tended to deny the universality of the Genesis Flood. Earth history has since been based upon observation and speculation, not experiment, while the result has been to introduce a world view which obviates the need for a Creator. Recent experimental work which should have been carried out long ago and is repeatable, observable and capable of predicting results has been confirmed by field observations. This work does indeed confirm the Genesis account of a universal flood and consequently puts into serious question the foundation laid by the Geological Society of London for today's geological sciences.

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WALTHER'S LAW OF THE CORRELATION OF FACIES

Walther first observed this effect in the Bay of Naples. In A the velocity of River water carrying sediment decreases as it enters the Bay and the heaviest sediments drop out first while the lightest sediments are carried furthest. Note the fish trapped in its own ecological zone by the settling sediment. After a period of time, B, the decrease in flow velocity occurs further into the Bay. The heavier sediments now begin to fall upon the lighter sediments which had settled previously; well defined strata are beginning to form and follow the contour of the bottom. The process continues in C. Note another fish trapped in its own ecological zone and at a later point in time. Finding these fish as fossils and not knowing the process, it would be natural to think that the second fish (in C) lived in an era long before the first (in A).