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JEAN-ANDRÉ DELUC ON SCIENCE AND THEOLOGY

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The discovery of the telescope and the microscope at the beginning of the seventeenth century led to the exponential increase of scientific research resulting in the many discoveries on the micro and the macro scale. Although there were attempts to use the results of science to diminish the role of theology, particularly in England and then in France, various authors turned that around and used scientific results to enhance theology. This was done on two fronts. First, physico-theologians proved the existence of God from the harmony and orderliness of the universe, and science helped them to see how intricate and far-going this orderliness is found in nature. Second, scientific results were used to show that Biblical statements concerning nature were accurate, which was the domain of what was termed sacred physics. In Switzerland, Johann Jakob Scheuchzer with his monumental *Physica sacra* (1731-1735) was an example of the endeavour in this area. Élie Bertrand was an example of a promoter of physico-theology. Physico-theology branched out in many subareas (bronto-theology, petino-theology, and many more), particularly in Germany, and Bertrand concentrated in his *Essai sur les usages des montagnes* (1754) on mountains and the natural and social phenomena associate with them to make his theological arguments. It is thus interesting, that one of Bertrand's countryman with a similar interest in geology that included the role of mountains did not quite see physico-theology as having great theological significance; at the same time, he was a strong promoter of sacred physics.

The presence of fossils of marine life on the dry land far away from any sea and even in the mountains has always been a puzzle. The biblical account of the flood indirectly offered an explanation: the entire earth was covered by waters from above and from below leading to the thorough destruction of life on all lands, and later the

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waters receded to uncover dry lands. This meant that some deposits of the remnants of the marine life could have been made in the process and left behind on the dry land after waters receded. All of it could have been explained as the result of direct divine intervention; however, many attempts have been made to provide naturalist explanations of the processes involved in the flood. A life long attempt to provide such an explanation was made by Jean-André Deluc (1727-1817), a Swiss naturalist, prominent in his times, active particularly in geological research across Europe. He was a reader to queen Charlotte, wife of king George III, a professor of natural history in the University of Göttingen, was active on the political scene in Switzerland and abroad, and an ardent adherent of Reformed beliefs[1].

1. GEOLOGICAL PERIODS

In most of his publications, Deluc spoke about two periods in the earth's history,[2] before the flood and after the flood (LE 94).[3] In his view, the flood was caused by what he called a great revolution; briefly: before the flood, there were seas and continents; the great revolution reversed these roles: the old continents were submerged becoming the bed of the new seas and the bed of the old seas was elevated to become new continents (LPM 5.467-468).[4]

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[1] P.A. Tunbridge, *Jean André De Luc, F.R.S. (1727-1817)*, "Notes and Records of the Royal Society of London" 26(1971), pp. 15-33; M. Hübner, *Jean-André Deluc (1727-1817), protestantische Kultur und modern Naturforschung*, Vandenhoeck & Ruprecht: Göttingen 2010.

[2] In this binary geohistory, "a relatively undifferentiated 'ancient' or 'former world' was sharply separated by a brief and unique Revolution from a distinctly different 'present world,'". See: M J.S. Rudwick, *Bursting the limits of time*, The University of Chicago Press: Chicago 2005, p. 158.

[3] References are made to the following books of Deluc: AG – *Abrégé de géologie*, Méquignon-Marvis: Paris 1816. C – *Correspondance particulière entre M. le Dr. Teller … et J.A. de Luc*, Les Frères Hahn: Hannover 1803. LB – *Lettres sur l'histoire physique de la terre, adressées à M. le Professeur Blumenbach, renfermant de nouvelles preuves géologiques et historiques de la mission divine de Moyse*, Nyon: Paris 1798. LC – *Lettres sur le Christianisme, adressées à M. le pasteur Teller*, La Librairie du Bureau des Arts: Berlin, Fr. Fauche: Hamburg, Ch. Pougens: Paris 1801. LE – *Lettres sur l'education religieuse de l'enfance*, La Librairie du Bureau des Arts: Berlin, Fr. Fauche: Hamburg, Ch. Pougens: Paris [1799]. LJ – *Lettre aux auteurs Juifs d'un mémoire addressé à Mr Teller, conseiller du consistoire supérieur, et prévôt à Berlin*, Berlin 1799. LPM – *Lettres physiques et morales sur l'histoire de la terre et de l'homme adressées à la Reine de la Grande Bretagne*, vols. 1-5, V. Duchesne: Paris; De Tune Libraire: La Haye 1779. LW – *Lettre sur l'essence de la doctrine de Jesus-Christ, adressée à Mons G.J.W. Wolff, pasteur de l'Eglise cathédrale de Brunswic*, Maison des Orphelins: Brunswic 1803. PT – *Principes de théologie, de théodicée et de morale: en réponse à M. le Dr. Teller*, Les Frères Hahn: Hanover 1803. TE – *Traité élémentaire de géologie*, Courcier: Paris 1809.

[4] A possibility of such a revolution was briefly mentioned by Pluche: "Whether there was at the Flood a universal tremor which changed the face of the earth by raising the low places where there was the sea and sinking very high places where people were living; or whether God only changed the place of waters, by giving us for habitation what was formerly covered by seas and by sinking most of the lands which were formerly inhabited to allow for the retreat of waters; it is from experience that wherever there are people, in the small islands as in the Continents, on the Mountains as in the plains and at the bottom of the quarries, there is an evidence of the presence of sea waters in these

Deluc justified his view by his decades long geological research, which he often conducted with his brother Guillaume-Antoine.

According to Deluc, the length of the period before the flood is undetermined, but at least the time of the flood could be to some extent established. There are some physical phenomena which can be used as chronometers. Deluc discussed at length many of them. For instance, a layer penetrated by vegetation, humus, of one foot is a product of ca. 2000 years (LPM 3.62) and the chronology established by fertilization of the earth establishes the age in terms of a few thousand years (32).[5] The age can be measured by the accumulation of sand carried by rivers, "true clepsydras" (LB 253), also, by the layers of peat (246), by glaciers (264), and by the formation of cliffs (274), which all allowed Deluc to established even more precisely the time of the great revolution which should not exceed 4000 years (AG 95, 100; LPM 5.632; LB 38; C 135), pointing to the year 2200 BC as the date of the flood.

Although the great revolution was of principal interest for Deluc, he also attempted to delineate the geological history of the earth before the flood. Clearly, he could not use the results of direct observation since the old continents were now at the bottom of the sea, inaccessible to human investigation. He used, however, his knowledge of geology to propose a possible reconstruction of the early natural history of the earth since he wanted to make the biblical account of the six days of creation credible from the naturalist standpoint, and thus, his reconstruction was given in terms of six periods.[6]

The first period: Before the creation of light, the universe was composed of disunited elements Deluc called pulvicules (particles of dust). The substance of light was added to the mass of the earth penetrating it and all other grand/celestial bodies. This penetration produced fire by the union of light with a particular element, the liquefaction of water by the union of fire with its element, and various chemical combinations of light with other elements. The element of water was in great abundance to some depth in the mass of the earth and after its liquification, it became a mixture of all elements forming dense liquid from which all substances that we now know were successively separated through chemical operations/reactions. The earth had the same form as it does today, a globe, and was rotating (LB 101-103). Since motion is not a property of matter, the original motion of planets was not of physical origin (104).

The second period: Today's layers on earth are the result of chemical combinations/reactions taking place in a watery liquid (LB 111). The chemical precipitation led

places". See: N.-A. Pluche, *Le spectacle de la nature*, vol. 3, Freres Estienne: Paris 1736 [1735], pp. 378-379. Deluc was familiar with the work of Pluche (e.g., LPM 1.141, 334, 338).

[5] In fact, some of this chronometry was well done and was bound by a fairly satisfactory estimate (50% error) of the age of the end of the last ice age. See: F. Ellenberger, G. Gohau, *A l'aurore de la stratigraphie paléontologique: Jean-André De Luc, son influence sur Cuvier*, "Revue d'histoire des sciences" 34(1981), p. 225, note 22; "His great diluvial Revolution corresponded to the state of the art in the 1770s, based mainly on the identification of a number of easy fossils from the tertiary age". See: R. Sigrist, *Collecting nature's medals*, in: *Jean-André Deluc: historian of earth and man*, eds. J.L. Heilbron, R. Sigrist, Slatkine Érudition: Genève 2011, p. 144.

[6] Cf. A.V. Carozi, *La géologie: de l'histoire de la Terre selon le récit de Moïse aux premiers essais sur la structure des Alpes et à la géologie expérimentale, 1778-1878*, in: *Les savants genevois dans l'Europe intellectuelle du XVII^e au milieu du XIX^e siècle*, ed. J. Trembley, Editions du Journal de Genève: Genève 1987, pp. 215-218.

to the formation of solids; first, liquid molecules changed to solid molecules when the union of fire with molecules of some substances was disrupted by the cooling of temperature (substances are liquid above some temperature and solid below it) (114-115). The solids produced or absorbed some expansible fluids of which external properties are known, but not their composition. The aggregation of solids in liquids produced various crystals, also powders or grains, some of which consolidated at the bottom of these liquids producing most of our stony mineral layers (117-118). Also, some ingredients ascended from the bottom; "the ascension of these ingredients was followed by the emission of other ingredients of a number of kinds, which, combined with *fire* and *light*, left the *liquid* in the form of *expandable fluids*." In this way, the formation of atmosphere coincided with the formation of mineral layers, for the most part including water in the form of vapours (122). The first results of the precipitation were various crystals of granite (123). A thick crust was formed around the globe with no traces of life in it (124).

The third period: After the liquid had been stripped of the substances from which the layers of granite were formed, new expandable fluids were released becoming expansible fluids from which new solid molecules resulted followed by precipitations different from those at the beginning; they produced gneiss, greywackes, primordial schists, and other layers (LB 125). The first granite layers "were deposited upon a large mass of mud mixed with liquid: the latter infiltrated little by little into the mass of pulvicles and produced in it depressions." Liquid that infiltrated the mass of pulvicles formed in various places solid masses which resisted being depressed and formed support of the crust, but the collapse of pulvicles formed caverns in which expansible fluids were collected, which also were collapsing (127), whereby the crust, having no support, cracked and was gradually going down (128), which reached the catastrophic extent so that eventually large areas of the crust were covered by water. The solid masses which originally supported the crust remained as mountains. This was the first revolution in which waters were separated from dry lands (149); the first continents were formed and vegetation developed on dry lands (130), although Deluc was silent about the mechanism by which vegetation came into being; it was presumably by an act of creation.

The fourth period: The creation of the sun; the sunlight caused new chemical reactions. The sun is an immense phosphorous body which decomposes itself by chemical reactions; from it light is detached (LB 135). An equilibrium of temperature is settled on earth by the regularity of changes of days and nights and of seasons (137).

The fifth period: Upon primordial schist layers, stony calcareous layers are deposited (LB 138) in which traces of marine life are found. In this period, life began in the sea. The crust fractured in the third period consolidated itself and could support itself in spite of the formation of immense caverns (139). The sinking of the crust that happened before became even deeper through which mountain ranges emerged under the sea and the disorder of mineral layers of our continents took place since calcareous layers slid through the fractures beneath primal granite layers (140). On top of calcareous layers stone layers of sandstone were deposited containing now extinct marine life (159). Expansible fluids caused the eruption of volcanoes, in particular, aquatic vapours (174). Earthquakes were also caused by aquatic vapours gathered in underground caverns (179).

The sixth period: The main product of this period were loose layers that contained remnants of marine life; these layers became the surface of our continents (LB 211). These layers underwent various catastrophes before they left the sea (212). Another great revolution led to the emergence of our continents and the destruction of the old ones (234). The submerged continents were covered only by primordial layers, the emerging continents were covered with very thick posterior layers with an occasional presence of the primordial layers (235).

2. INTERPRETING THE BOOK OF GENESIS

Deluc was certain that his geological explanation of past events in the history of the earth confirmed the Genesis account. However, it may appear that he interpreted this account in the way to make the fitting between his theory and this account more credible by interpreting some of its elements in the way which was not universally embraced by Bible commentators.

First, in his opinion, the six creation days described in Genesis were not 24-hour days, but periods of undetermined lengths; "time is nothing for the Divinity and centuries are but instants of duration of the Universe" (LPM 1.357). The sun was created on the fourth day, and thus, at least before the creation of the sun, the days were measure differently (356; LB 97). That is, Deluc extended the undeterminedness of the length of the day for the first three days of creation to the other three days. A case could be made that just as likely the determined length of 24 hours for the last three days of creation should be extended to the first three days. At one point, Deluc considered the argument from the creation of the sun of secondary importance saying that after creation, natural processes were executed according to natural laws leaving behind "observable impressions" on earth which should be studied. If these studies indicate that the observable processes require a very long time to complete, then the meaning of the word "day" should be adjusted accordingly (C 6).

Second, Deluc stated that the earth destroyed by the flood was only the inhabited land of the old continents (LB 293; LPM 5.631). There were portions of the land not submerged by the flood, namely the under sea mountains whose peaks were visible above the sea level as islands, the islands that became parts of mountain ranges on the new continents after waters receded from the old sea. In particular, the peaks of the Ararat mountains were islands (LPM 5.654) since they were covered with vegetation to become a subsistence for Noah and his family (656). This is because all plants and seeds were destroyed under the salty water (LB 310). In particular, the Ararat had vegetation that included olive trees and vines (311), only later vegetation disappeared from the Ararat because of low temperature (312, 263).

Also, Genesis does not say that all kinds of animals were saved in the ark (LPM 5.661). Islands of the old sea were the principal source of the new population of animals and plants (662): "Setting aside the *animals* immediately necessary for people, and those which, for particular reasons, Noah was ordered to get in the ark to preserve the species with him (such as the raven), the new lands were populated with animals from the *mountains*, which were [also full] of *plants*; and this is [the reason for] the phenomenon of *corpses* found in our surface layers, up to the North, of *animals*

which live today only in the *tropics*." Some animals spread from our mountains, some became extinct (LB 320): remnants of elephants and rhinoceros and also marine life are found in the North in the same layers; today, these animals live only in tropical weather (LB 17). Elephants, rhinoceroses, and hippopotamuses lived in islands on the old sea and could not live in the cold atmosphere after these islands became hills, so, they migrated south (19-20, 217; AG 83; LPM 2.247-248, 260).

The existence of islands-turned-into-mountains provided also a solution for the problem of the survival of the fish that could live only in sweet waters: they survived in lakes on these islands and then spread to the new lands (LPM 5.514, 667).

If islands preserved flora and fauna, could they have preserved people? Although Genesis speaks about the destruction of "all people" (Gen. 7:21), in Deluc's opinion, not always "all" is an absolute "all," as "all" in Gen. 6:21 indicates (LPM 5.663). Genesis spoke about the destruction of corrupted people. Did the predecessors of the Incas separated from continents in their islands participate in this corruption of others? "This separation was made easy by all the accidents which populated the *Islands*; for those which now form the *Summits* of the *Andes* were not nearly as far from the *ancient Continent* as *America* is from *Asia* and *Europe*." Having briefly raised such a possibility, Deluc immediately withdrew from it: I don't insist on this point, he said. There may be many other causes of populating America and all islands since the flood (665-666). More decisively, after one critic pointed to the possibility of islands to be inhabited by people, Deluc said that this was a view he abandoned (LE 192).[7] The only argument he could use would be taken from Genesis by acknowledging that "all" in "all people" should be understood literally, after all (well, with the obvious exception of Noah's family).

3. THE BOOK OF GENESIS AND GEOLOGY

Deluc said he was interested in theology from very early on (LC 51) and to a large extent, his interest in geology was theologically motivated. He was convinced that Genesis, the opening book of the Bible, was the foundation on which the veracity of the entire Scripture rests. The Genesis account of the stages of the creation of the world were clearly not based on any scholarly investigation by Moses. Is this just a story? In the times of Deluc, many authors thought so explicitly calling it a fable or implicitly by considering it an allegory and a hieroglyphic discourse (C 15, 178, 337; W 97-98). Deluc, a devout Christian, could not have that and he was committed to prove that the Genesis description could be understood quite literally not just accepting it by pure faith, but also by using the confirmation provided by scientific research. To him, using empirical data from experiments and observation of nature made credible that the natural processes detected by current science could be used to explain the processed delineated in Genesis. The earth "shows everywhere the proofs of the veracity of what Genesis speaks about" (C 16). In particular, Genesis never mentioned the real cause of the flood (LPM 5.648). To prove the reality of the flood,

[7] Another critic also observed that if people could survive on islands, then "it would surely be much more convenient for Noah, his family, and animals, to have taken refuge on one of them, than to remain pent up in the ark". See: R. Kirwan, *Geological essays*, T. Bensley: London 1799, p. 65.

the present state of the earth should be studied, the causes affecting continents and the seas to see if a revolution could have taken place (C 212), and Deluc was convinced that his naturalist theory of the flood explained it much better than any other theory he quite thoroughly scrutinized. Moses was not a geologist and he could have described the history of the earth only by direct divine inspiration (C 140). That is, the Genesis description of the creation and of the flood is made credible by scientific explanation of the involved processes, then the rest of the Genesis account, and in fact, the rest of the Scripture should be accepted as believable.

Deluc's geology may be of Biblical motivation, but not of Biblical basis; it is a self-standing science based on scientific research. As Deluc stated, he did not deduce geology from Genesis; rather he made conclusions based on natural sources, namely the state of the earth and the terrestrial physics. Only after comparing the narrative of Genesis and the results of geology did he see close correspondence between them and concluded that that what Genesis said was real (C 119-120). And again, geology should be established completely independently of what Genesis says; it can and it did direct research as to its objects, but it cannot supply certainty as to the results of this research; these results should be based on facts. If these results agree with the Biblical account (359), this is an incontestable proof of the divine inspiration of Genesis (360). If the physical events in Genesis are true, the Bible is reliable since the writer of this book was inspired by God (200).

Deluc did not have any doubt that Christianity was the true religion; for him, Christian religion was the greatest gift for humankind, the only one that could render human existence worthwhile (LPM 1.237). He wanted every person to share this conviction. Genesis played an important role in this process. In particular, to become Christians, the Jews have to return to their proper faith that they abandoned by considering Genesis to be a legend; then they will recognize Jesus and the awaited Messiah (LC 198), so, they have to become true Jews just as Christians have to by their faith in the Old Testament (199). It is because Christianity itself is based on Genesis which rests on indelible monuments of the earth and of the human history (LW 55), Christianity originates in Genesis on which also the entire Bible rests (68).

4. SCIENCE AND REVELATION

Deluc's attempt to coordinate the findings of science with the flood account leads to a larger issue: what is the relation between science and revelation, or, between reason and faith?

On the one hand, there is science with observation and experiments used to create hypotheses and theories. On the other hand, there is the revelation which speaks about issues that exceed the scope of rational reasoning, such as the virgin birth, the incarnation, or the resurrection. In between there is natural religion which makes religious statements based on the human natural lights. The idea of the importance of reason in religious matters was very important in the 17th and 18th centuries with the prevalent use of physico-theology: the existence of God and some of His attributes can be proven from the observation of the world the complexity and orderliness of

which pointed to its creation by a design, and a design on a cosmic scale requires a divine Designer. And Deluc was not silent about the issue.

The knowledge of the existence of God was important because of the eternal consequences for each person, all the more that the dogma about the immortality of the soul is imprinted in the mind of all people (LPM 1.352). The eternal fate of a person depends on following the moral code in this life. What should this code be? The human heart is good and loving by nature (LPM 1.34) and it leads people to the moral good, but it can be blinded by passions (30), and hence the reliance on the voice of the human heart is not sufficient. Moreover, the variety of views among atheists and pantheists, etc. indicates that we should not expect that from the human reason alone can come one principle of moral obligation which all people would agree to follow (LB xlii). There is no source of morality that would present itself to the human reason. Atheists base their morality on a perpetual fiction stemming from the idea of justice and convention already established among people (L).

If the voice of the heart is wobbly and unreliable and the voice of reason is not an unshakeable guide, what happens to natural religion? Some deists among theists say that duties are impressed on the human soul and natural lights can discover rules to follow; this is natural religion that enters moral sense (LB xliv). However, that really comes from upbringing (xlv). This popular idea of natural religion which each person can find in himself and develop by reason still needs revelation for its basis (LW 61). There was always positive religion and religion born in the human spirit never existed (62); people get it through education and believe they formed it by themselves. Or some tradition did survive in a distorted form among pagans (63). Therefore, natural religion is an illusory concept considered to be inborn or acquired by inborn faculties, whereas it is just the result of upbringing, enlightened or misguided, or tradition that transmits God's teachings directly to some chosen messengers, transmitting these teachings faithfully or in with various levels of distortion. Only revelation is the sure source of things divine; it is the revelation or bust.

And hence, the idea of God and the created world can be rejected if it is presented merely as an idea of reason (LJ 52). The idea of God cannot be discovered by people; this existence has to be presented as a fact by immediate proofs, not as a conclusion of a research (LE 32): "if we study Man himself, stripping ourselves of all received ideas and follow him in his history, focusing attention on what he has always recognized as not coming from his research, we cannot discover any route by which, without Language, and with so many needs to satisfy, which would have fixed his attention on the sensory objects around him, he could have arrived at the idea of a Being that not only he couldn't understand, but whose *action* he cannot grasp. So that by this consideration alone, we feel the necessity that the existence of a *Creator* of the Universe was taught to people by this Being himself, not as something they could understand, but as a Fact" (LJ 137).

Theists do not convince all people about the existence of the supreme Being by reason alone; a sure base would have to be directly communicated by God (LB li). It is not reasonable to continue the search for a first principle of the moral obligation by casting doubt on whether the one that exists from all times as proceeding from the revelation given by the supreme Being is this source. Having created people, God did not leave them to themselves as to their origin and obligation, but He instructed

them (cxxvi). Replacing the wisdom of God with human wisdom is the height of pride (cxxviii). The reliance on reason is absolutely insufficient to bring people to the practice of duties necessary for the existence of societies; it is through the formation of the spirit and the heart of children through the education from the Scriptures (LE 127).

When addressing the Jews, Jesus considered the existence of God and His providence to be dogmas already established by the manifestations of God in various times and He relied on the Scriptures which were the only foundation of Jesus' theism (LW 11). There is in the Gospels no proof of the existence of God and His providence which is not derived from the revelations given in the Sacred books of the Jews (12). The nature of God that is always incomprehensible for humans is revealed to them fully with the coming of the Saviour promised to the first parents (13).

Moreover, Jesus proclaimed His theology not as understandable by humans, i.e., not by starting from known things and the deductions of reason, but as the manifestation of truth, something important for them to know their relation to their Creator as intelligent and moral beings who fell from their state of innocence (LW 21). Jesus did not reason about the immortality of the soul but announced it as the one having the power over life (34). A true Christian does not follow his own ideas, does not consult human moralists as to his conduct, does not find satisfaction for his reason and conscience when following the rules prescribed by the Legislator who is also the Saviour of people, and this is the greatest happiness on earth. The morality of Christ was restored, the moral laws were extended to conform to the new state of humankind and the pure doctrine of Jesus is in the Bible (38-39). Jesus added to the decalogue the laws of charity announced mainly in the sermon on the mount confirmed by miracles and prophecies (40). Christianity, which is founded on the revelations of God concerning the coming of the Messiah, could be instituted only by the fulfilment of the prophecies in Christ (41). Religion is nothing if it is not recognized to be founded on direct manifestations of God, otherwise, how could people trust in things they could not comprehend and what would be the reason to submit themselves to the laws contrary to their inclinations (50)? Therefore, Deluc found it unacceptable that preachers in his days spoke only about duties and based them on reasoning, instead of using the Bible as the voice of God and the source of dogmas, morality, faith, and duties (C 32).

Adam and Eve were instructed directly by God; they departed from God's rules which led to the flood; then there was a departure again, and God revealed Himself to Moses (54). All nations know about the existence of God from revelation, not from reasoning (LE 198; LC 258). All nations have some notion about the origin of the universe and that they were supernaturally instructed that the world and people were created by a superior Being; all these traditions include elements of the cosmogony of Moses (LJ 25), in particular, traditions of all nations agree as to the origin of humankind from the family saved from the flood (28; LJ 135).

It is impossible that the human society could be formed without mutual advantage (LB lx). In all societies, the basis of mutual confidence was the conviction that the supreme Being existed as established by tradition, not by speculation (lxi). History attests the social oath as a religious act was always view as binding people against their future whims with regard to the state when also precise rules of personal conduct were seen as emanated directly from a supreme Being (lxvii-lxviii), the Being that rules the

universe and who punishes transgressors, and the attention given to religious rituals was a proof for everyone that moral laws were sacred. These opinions proceed from the revelation of God to Noah and earlier to Adam (LJ 82). The basis of morality is in the laws of God, not in the human heart. Only through these laws emanating from God and known to people their conscience could accuse them (LC 187).

This realization has an immediate consequence in the area of education of children. The objection that teaching children too early, since the child does not understand who God is, is unjustified; after all, does anyone understand God? Without being taught about the existence of God, who would have an idea of God without understanding Him? The idea of God cannot be discovered by people; this existence has to be presented as a fact by immediate proofs, not as a conclusion of a research (LE 32). After children are taught that the world did not make itself; that there is its Creator who preserves it and from Whom comes all that people have; that people are destined to the next life where they will gather fruits of their labour in this world, "there will be no problem in making them understand that since God wants to be obeyed, He must have given to people *precise Laws*, and this is how you will introduce them to the knowledge of our *sacred Books*," and they should be instructed from the Scriptures (40).

5. PHYSICO-THEOLOGY

Because of the primacy of revelation and Deluc's lifelong interest in theology, why wouldn't he stick to theology, why would he spend a greater part of his long life on meticulous and often exhausting scientific research if it were enough to turn to the Scripture as a sure guide concerning religion and morality derived from it to secure the kind of life acceptable in the eyes of God? After all, geology had apparently been of no use before, since the Jews and Christians had the history of the earth and of humankind in Genesis and pagans had it in their mythologies (TE 2). The problem was that the early geological systems were erroneous and yet they were considered authoritative enough to dismiss the Genesis account.[8] With his monumental efforts, Deluc showed at length why other geological systems should be rejected and why his own should be taken in their place. Also, if all in life ultimately depends on the way revelation is treated, there is a need for certainty that the revealed Scripture comes truly from God. Since the Scriptures are founded on Genesis, this is where human efforts should be concentrated, namely on making certain that its accounts that can be scientifically tested are believable and if they are, then the rest of the Bible can be assumed to be divinely inspired. Therefore, God, by inviting in revelation the study of nature, prepared in advance the reestablishment of faith when in the passing of time, the fault of imagination or human passions gave rise to incredulity (LB 336-337). This is where physico-theology may make its mark, but not on a grand scale as it often claims to be able to do by proving God's existence and His attributes. Deluc did say that everything in the study of nature pointed to a design (LPM 2.138). In particular, mountains, one of the most beautiful books of the world, one of those where people

[8] Cf. Ch.C. Gillispie, *Genesis and geology*, Harvard University Press: Cambridge 1951, p. 62.

learn their nature and the designs of God in the universe (128). The contemplation of nature leads people to its Author, to His goodness and to human hopes (LPM 3.21). So, it would appear that, for Deluc, some claims of physico-theology were justified. However, physico-theological proofs from the order and succession of being in the universe is surely within the reach of people, but they have to be first instructed by revelation. Physico-theological argument can only be secondary; "the *Revelation*, the proofs of which are in the *facts*, must be and has always been, the basis of *Theism*" (LC 259). Physico-theological proofs are but the exercises of thought and if there is nothing more, they lead to the labyrinth from which an exit cannot be found. The revelation alone can convince people that God exists. Physico-theology can be used not to prove God's existence, but to show God's power, wisdom, and goodness (260).

So, the investigation of nature as a means to make theological claims the way physico-theology did was ruled out by Deluc. It can play a role as an enhancement of theology and religion, as a means of restoring the faith in revelation. Reason, shaky as it is, can do something about theology showing also along the way that, by itself, it does not lead to a reliable result. Only the voice of God as transmitted in the Scriptures can do it. Only the Bible is the source of the knowledge of God (C 54). People could never conceive the idea of God if God did not reveal Himself to them; thus, people can limit themselves to the study of revelation (PT 118).

However, the investigation of nature has also a very personal, even mystical dimension. The study of nature should not be confused with feeling it; people will be always novices in studying it, and as to feeling, they have all that is needed (LPM 1.108). "The immediate and lasting consequence of each moment of attention to phenomena is for me a delight a thousand times sweeter than that which I experience at the solution of a Physics problem. It is a pleasure of the Soul, which penetrates Man into his principal essence: it is of the kind of delicate Love or rather, it is [its] supreme degree, since it is excited by the contemplation of the Being who possesses all that is good and beautiful and who takes hold of the heart through recognition, admiration and hope" (106). Somehow mountains affected Deluc the most, since in mountains he often fell into an ecstatic mood asking God to strip from him his corporeal exterior to become perfectly happy; it is in mountains that more arguments can be found for the spirituality and immortality of the soul than in any philosophical writings[9]. And thus, God does speak to people through nature, to their reason and feeling, but they can so easily be confused by their weakness. For Deluc, ultimately only the revelation stands.

CONCLUSION

Deluc was not an unusual representative of an eighteenth-century scholar who was equally serious about his scholarly pursuits and about his religious beliefs. In fact, as for others, the problem was how to combine the two. The physico-theology of his times provided a much stronger say to naturalism in theological matters by promoting

[9] J.A. de Luc, *Lettres physiques et morales sur les montagnes et sur l'histoire de la terre et de l'homme adressées à la Reine de la Grande Bretagne*, De Tune Libraire: La Haye 1778, p. 195.

teleological proof of the existence of God, Deluc saw only a secondary role of science in theology by viewing it as an indispensable tool to strengthen the faith in the reliability of the Biblical account in matters concerning physical phenomena, which included the Genesis description of the flood. However, he was in the minority in his time with his conviction that physico-theology was unable to play a larger theological role, in particular, in providing any proof of the existence of God or give any moral guidance based only on the investigation of nature. The role of the Scripture in that respect was for him irreplaceable.

JEAN-ANDRÉ DELUC ON SCIENCE AND THEOLOGY

SUMMARY

Jean-André Deluc, one of the most prominent Swiss naturalists of the eighteenth-century, saw his extensive scholarly work as an enhancement of theological investigations. For him, the Scripture was an ultimate authority in theological problems, however, the veracity and the reliability of the Scripture needed support by scholarly investigation of nature. In particular, Deluc's was a life-long effort to show that the Biblical account of the flood can be supported by the geological data available in his times.

JEAN-ANDRÉ DELUC ÜBER WISSENSCHAFT UND THEOLOGIE

ZUSAMMENFASSUNG

Jean-André Deluc, einer der bedeutendsten Schweizer Naturforscher des 18. Jahrhunderts, verstand seine umfangreiche wissenschaftliche Arbeit als Bereicherung der theologischen Forschung. Für ihn war die Heilige Schrift die letzte Autorität in theologischen Fragen, aber die Wahrhaftigkeit und Zuverlässigkeit der Heiligen Schrift musste durch die wissenschaftliche Erforschung der Natur gestützt werden. Insbesondere bemühte sich Deluc sein Leben lang zu zeigen, dass der biblische Bericht über die Flut durch die zu seiner Zeit verfügbaren geologischen Daten gestützt werden kann.

JEAN-ANDRÉ DELUC O NAUCE I TEOLOGII

STRESZCZENIE

Jean-André Deluc, jeden z najwybitniejszych szwajcarskich przyrodników XVIII wieku, widział swoją obszerną pracę naukową jako dopełnienie swych inwestygacji teologicznych. Pismo Święte było dla niego ostatecznym autorytetem w kwestiach teologicznych, jednak prawdziwość i rzetelność Pisma Świętego musiala być wsparta naukowymi badaniami natury. W szczególności Deluc przez całe życie starał się wykazać, że biblijną relację o potopie można poprzeć danymi geologicznymi dostępnymi w jego czasach.

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