

## GEORGES CUVIER AND THE USE OF SCRIPTURE IN GEOLOGY

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## INTRODUCTION

Georges Cuvier (1769-1832) is a founding father of modern biology specifically of animal classification, comparative anatomy and the study of fossils. He preached the benefits of keeping science separated from religion and metaphysics. But when William Whewell (1847) claimed that creative purpose is a religious idea crucial in the zoology of Cuvier, he started a controversy that remains unresolved today. It was not clear whether Whewell was referring to natural or divine purpose because he offered no evidence for his claim.<sup>1</sup> If it was divine purpose there would have been reason to assume that Cuvier's religion was entangled in his zoology. Some believe that Cuvier practised what he preached,<sup>2</sup> but others allow for various degrees and kinds of cognitive influence of his religion in his natural history and geology.<sup>3</sup> This chapter describes how Cuvier employed the Bible in his geology.<sup>4</sup>

One reason for this confusion is a failure to consider Cuvier's distinction between speculative and responsible metaphysics. Responsible metaphysics is empirically testable

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<sup>1</sup> Whewell 1847: vol. 3, 515 cited from Letteny 1999, 32.

<sup>2</sup> Coleman 1964, 178; Outram 1984, 147; Atran 1990, 245.

<sup>3</sup> Negrin 1977, 310-312, 318; Appel 1987, 42, 45, 52, 58, 137-139, 141, 151; Letteny 1999, 107-114, 126, 418, 453-454, 506-508; van der Meer 2005, 181-193.

<sup>4</sup> This paper was presented on July 20, 2006 at a conference on "Interpreting Nature & Scripture: History of a Dialogue," July 18-22, 2006, Redeemer University College, Ancaster, Ontario, Canada and at the Annual Meeting of the History of Science Society, Vancouver, November 2-5, 2006. It was completed before Rudwick 2005 became available in October 2006.

metaphysics. For instance, in animal classification the goal was to use characters that produced the simplest and most general classification. This, Cuvier wrote, can be achieved by,

assigning to each class and to each of its subdivisions, common qualities that apply to the largest number of organs. One can arrive at this goal in two different ways which can serve to prove and verify each other: [ ] observation of how species fall into groups, and [ ] a prior decision on certain principles of division, ...

One of these principles was the Principle of the Conditions of Existence. Cuvier believed that God had endowed each kind of organism with a goal-directed plan when it was created.

Combinations of parts that interfere with the purpose of maintaining the existence of an organism are, therefore, excluded. This exclusion is stated in the principle as a metaphysical derivation from his religious belief in a God who gave a purpose to each organism. The principle entails that units of classification (taxa) must be discontinuous because some combinations of parts are excluded. But prior assumptions can be in error. Therefore, complementing this deductive approach, the identification of the members of the taxa or *embranchements* occurred empirically. Only “When the accepted principles do not conflict with the combinations arrived at by observation, and when observation points to these principles, the two means agree.”<sup>5</sup> The

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<sup>5</sup>“....., il faut [ ] que l’on puisse assigner à chaque classe, et à chacune de ses subdivisions, des qualités communes touchant la plus grande partie des organs. On peut arriver à se but par deux moyens différens, qui peuvent se servir de preuve et de vérification l’un à l’autre : [ ] l’observation des espèces à leur réunion en genres, et [ ] de fixer d’avance certaines bases de division, .... [ ] Lorsque les bases qu’on a adoptées ne rompent point les combinaisons auxquelles

distinction between responsible and speculative metaphysics allowed him to define public knowledge of nature as knowledge to which everyone could contribute private beliefs provided these beliefs were open to empirical test. Public science is a science free from speculative metaphysics. Cuvier could risk exposing his religious beliefs as translated into what he considered responsible metaphysical beliefs to empirical test because he believed nature and scripture had a single Author guaranteeing that both would lead to the same truth. Thus the confusion disappears when Cuvier's diatribes against religion in science are seen to be directed against what he considered as the irrational and speculative dimensions of religion. The rational and responsible dimensions of religion are allowed to shape his natural history.<sup>6</sup>

Another reason for the confusion about the role of religion in Cuvier's scholarship lies in a failure to recognize the various ways in which historically religion has entered scholarship. Religion has entered scholarship indirectly through a religious perspective on the subject matter. For instance, the Christian Bible can provide indirectly a general perspective on nature. Examples include nature as orderly, contingent, deterministic, purposeful, static, or dynamic.<sup>7</sup> Such general perspectives involve many texts across all Bible books interpreted in context both intra-biblical and extra-biblical. Thus the Bible as a whole provides indirect knowledge of nature. Another entry is via isolated Bible texts used directly as source of scientific information without

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l'observation conduit, et lorsque ces bases sont indiquées par les résultats de l'observation, les deux moyens se trouvent d'accord, " Cuvier 1800-05, vol. 1, 62-63.

<sup>6</sup>van der Meer 2005.

<sup>7</sup>Brooke 1991; Brooke, Osler, van der Meer 2001.

regard for context.<sup>8</sup> Part of the problem is that some authors have focused on this direct use of the Bible overlooking its indirect influence in shaping general religious perspectives on nature. For instance, Outram (1984) argues that Cuvier had attempted to separate professional geology from Scriptural or flood geology by excluding the use of Bible passages as justification for geological explanations.<sup>9</sup> In doing so, however, she overlooked the fact that even if Cuvier moved away from using Bible passages in geology directly, the Bible could still function indirectly by providing a general perspective on nature which could be translated into metaphysical beliefs that shape his geology and natural history. Cuvier held two such beliefs namely that nature is purposive and that nature is contingent.<sup>10</sup> As a result Outram failed to see that such general beliefs about nature or history have shaped Cuvier's perception of reality and scientific explanation both directly and indirectly via metaphysical beliefs.

But even if one sees the general perspectives there is a further subtlety. In the question raised by Whewell's claim, natural and divine purpose were seen as alternatives. But, natural and divine purpose were not separated in Cuvier's thought and the influence of both is seen in his

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<sup>8</sup>Brooke 1991.

<sup>9</sup>Outram 1984, 141-160, esp. 147. Negrin (1977, 296) argues that Cuvier uses the Pentateuch as the norm for the historical development of human civilizations. This does not necessarily contradict Coleman (1964) and Outram (1984) because it involves two different issues, namely the physical history of the earth and the cultural history of human civilizations.

<sup>10</sup>For an analysis of the role of general theistic perspectives in the work of Cuvier, see: van der Meer 2005. This chapter focuses on the role of isolated bible texts.

zoology. This, however, can be seen only if one recognizes that a religious belief in divine purpose can have a metaphysical function and *vice versa*.<sup>11</sup>

Cuvier was educated in the late eighteenth century during which the notion of the Book of Nature was at its pinnacle in the form of natural theology. In natural theology there was an argument from knowledge of nature to the existence of God. In contrast, Cuvier argued from knowledge of God to knowledge of nature using the two approaches just mentioned. The perspectival approach is present in Cuvier's perception of reality as divine creation. This perspective is specified in two religious beliefs, namely that nature depends upon divine providence (is contingent) and reveals divine wisdom and power (is purposive). The religious ideas of divine wisdom and power entered natural history as the argument from divine purpose and the argument from divine freedom, respectively. Elsewhere, I have described a variety of cognitive effects of his religious knowledge in his zoology and argued that these effects are mediated by two metaphysical principles known as the Principle of the Conditions of Existence and the Principle of the Correlation of Parts.<sup>12</sup>

Here I ask whether Cuvier used Bible texts as source of geological information (Scriptural geology) and if so, how he used these texts. Specifically, I explore three claims. These are: (i) that Cuvier treated the Bible as any other book, (ii) that Cuvier used the documentary hypothesis of higher bible criticism, and (iii) that Cuvier tried to separate professional geology from Scriptural or flood geology and did not use Bible passages as justification for scientific

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<sup>11</sup>van der Meer 2000, 2005.

<sup>12</sup>van der Meer 2005

knowledge.<sup>13</sup> My theses are (i) that Cuvier treated the Bible as a book with divine authority, (ii) that he did not accept higher biblical criticism, and (iii) that he used Bible texts in geology as well as in natural history and history of civilization, but that he was not a scriptural geologist because his usage was qualified by Augustine's principle of accommodation.

#### VIEW OF THE PENTATEUCH

Did Cuvier consider the Bible as any other book and did he accept the documentary hypothesis? Cuvier rarely used the Bible in his work, but when he did, he took it along with other ancient literature as sources of information about the relationship of the history of nature and the history of civilizations. Acting as an antiquarian he took these textual sources along with fossils as 'documents' showing that the history of nature and civilization overlapped. This explains his interest in the Pentateuch. Accordingly, in what follows I will treat these 'documents' as having the same evidential status for Cuvier.

#### *Texts on the history of nature*

#### *Species definition*

In a letter to Pfaff dated August 22/23, 1790, he gave a species definition in terms of his belief that God had created an original pair for each type of organism including humans (Genesis 1: 26-28 and Genesis 2: 7, 21-22):

; we think that a species consists of all offspring of the first pair created by God,

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<sup>13</sup>Outram 1984, 141-160.

similar to how all people are thought to be sons of Adam and Eve.<sup>14</sup>

This information was public. Cuvier's letters to Pfaff served as reports to the members of the Natural History Society which Cuvier had started at the Caroline Academy in Stuttgart. They regularly contained messages for other members some of whom became professional scholars such as the naturalist Karl Friedrich von Kielmeyer (1765-1844) a professor of chemistry and botany at the university of Tübingen, the electrochemist Christoph Heinrich Pfaff (1773-1852), a professor of chemistry at the Christian-Albrecht University of Kiel, and the biologist Johann Heinrich Ferdinand Autenrieth (1772-1835), professor of medicine at the University of Tübingen. This particular letter contains a section on the anatomy of the fresh water mussel *Mytilus* which Pfaff is asked to show to Kielmeyer. Cuvier still maintained this species definition in 1828.<sup>15</sup>

#### *Genesis days*

Further, in his geology course for a popular audience in 1805, the six days of creation in the Book of Genesis were interpreted as six geological periods. The creation of animals on the fifth day corresponded to their appearance in the fifth period of the geological record.

As regards the epochs of creation of inorganic bodies, plants, and animals,

[Genesis] always goes hand in hand with what we can deduce from observations

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<sup>14</sup>“...; wir bilden uns ein, eine Species sei die ganze Nachkommenschaft des ersten von Gott gebildeten Paares, ungefähr wie die Menschen alle als Söhne Adam's und Eva's vorgestellt werden.” Behn 1845, 172; Marchant 1858, 178-79.

<sup>15</sup>Cuvier and Valenciennes 1828-33, vol. 1, 543.

by reasoning. For example, the geological record shows us that fossil fish are always found underneath, and mammals above .... never men, the latest and newest creations.<sup>16</sup>

*Noah's flood*

Cuvier studied ancient texts in order to clarify the relationship between the history of ancient societies and that of the earth. He used flood stories because evidence for floods had been recorded both in ancient texts and in features of the earth. This allowed him to establish an approximate date for the last catastrophe of which he had the physical evidence. In the *Recherches sur les ossements fossiles* of 1812 written for professional geologists, the Genesis story about the Flood was used as a fact about the history of the earth.

Moses established a widespread [générale can be global] catastrophe, an irruption of the waters, an almost complete regeneration of humankind, and he places the time period only fifteen to sixteen centuries before him. This is based on texts which lengthen this interval. Therefore, [this catastrophe occurred] less than six thousand years ago.<sup>17</sup>

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<sup>16</sup>Marzari Pencati 1805, 1-2, tr. Corsi 1988, 184.

<sup>17</sup>“Or, Moïse établit une catastrophe générale, une irruption des eaux, une régénération presque totale du genre humain, et il n’en fait remonter l’époque qu’à quinze ou seize siècles avant lui, selon des textes qui allongent le plus cet intervalle, par conséquent à moins de cinq mille ans avant nous.” Cuvier 1812, Vol. 1, 95.

Cuvier interpreted the Biblical flood and other catastrophes as regional.<sup>18</sup> This interpretation of Genesis 6-9 was shaped by the alternating sequences of marine and terrestrial fossils Cuvier had observed in the Paris basin. Cuvier rejected the idea that successive populations of terrestrial animals had been newly created. So their origin could not be explained unless they had immigrated from elsewhere and this excluded a global catastrophe. He did not consider possible causes, the duration or any other aspects of this flood.

We may infer that Cuvier is using an interpretive strategy known as the principle of accommodation. Cuvier encountered it early in life. His elementary school teacher and maternal uncle Samuel Frédéric Châtel ((1734-1805) ) studied theology during the 1750's at the seminary of the University of Tübingen where a professor Israel Gottlieb Canz (1690-1753) taught during 1747-1753. Canz held that the world was created in a moment and that the story of the six days was God's way of revealing this instantaneous creation.<sup>19</sup> Also, Cuvier's cousins studied in Tübingen when the so-called Storr school of thought in theology was prominent (1777-1812). Christian Gottlob Storr (1746-1805) taught philosophy (1775-77) and theology (1777-97). His supernaturalism separates him from the naturalistic theology of the Enlightenment, for instance, in his belief in the divine authority of the Bible and his rejection of the theory of accommodation. Finally, between 11 and 12 years of age Cuvier discovered Buffon's *Histoire naturelle*. He always carried one of the many volumes in his pocket even in church where he read it as if it was a psalter or bible.<sup>20</sup> In the 1778 supplement to the *Histoire naturelle* entitled *Des époques de la*

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<sup>18</sup>Cuvier 1812, Vol. 1, 81, 110; 1821, Vol. 1, LXIII.

<sup>19</sup>von Weizsäcker 1877, 107.

<sup>20</sup>Debard 1982, 119.

*nature*, Buffon argued that the seven days of creation in the book of Genesis were an accommodation to the understanding of the original audience and corresponded with the seven epochs of natural history he had described.<sup>21</sup> No wonder Cuvier used this concordance in his 1805 geology course in Paris. Finally, commenting on the Galileo affair and the committee of theologians which had declared the Copernican system absurd in philosophy and heretical in theology, Cuvier reflected on the question of how texts describing the Sun as moving ought to be interpreted:

This committee shows how it allowed absurdity in philosophy; as for heresy, it based it on some Bible passages, with the result that the sun moves in space, and that the earth is motionless in the centre of the world. But the Bible is written in popular language, as is natural in a book that is not concerned with teaching astronomy; even we ourselves still say the sun rises, the sun goes down, even though we know that things do not happen that way.<sup>22</sup>

In this passage Cuvier took the position that God had adjusted himself to the limitations of human *knowledge* by using the *language* of ordinary unreflected experience. From the limited

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<sup>21</sup>Buffon 1778, Supplement 5, 1-254, 495-599.

<sup>22</sup> “Cette commission démontra comme elle put l’absurdité en philosophie; quant à l’hérésie, elle la fonda sur quelques passages de la Bible, desquels il résulte que le soleil se meut dans l’espace, et que la terre est immobile au centre du monde. Mais la Bible est écrite en langage populaire, comme il était naturel de le faire dans un livre où il ne s’agissait pas d’enseigner l’astronomie; nous-mêmes nous disons encore le soleil se lève, le soleil se couche, bien que nous sachions que les choses ne se passent pas ainsi.”Cuvier 1841-45, vol. 2, 285-86.

extent Cuvier attributed to Noah's flood we may infer that he saw the global language with which it is described in Genesis 9 as accommodated as well.

Cuvier's approach to the relationship of Bible and geology as well as natural history is similar to Galileo's. Galileo adopted the Copernican system because it offered the simplest account of his observations and these in turn were the reasons why he re-interpreted Bible passages that had been understood geocentrically. But he was at pains to show that his re-interpretation of Scripture was squarely within the patristic tradition and followed Augustine's commentary on the book of Genesis.<sup>23</sup> Likewise, a set of geological and biological observations and explanations became the occasion for Cuvier to re-interpret the biblical story of the Flood. The re-interpretation itself, however, proceeded within the limits of the Augustinian principle of accommodation, an exegetical standard also used by Galileo.

### *Texts of ancient civilizations*

#### *Exodus of the Israelites from Egypt*

In that same publication of 1812 Cuvier took the Exodus of the Hebrews under Moses as historical fact:

Moses and his people left Egypt which by the testimony of all the eastern nations is the most ancient civilized kingdom of all those around the Mediterranean. The lawgiver of the Jews had no motive to shorten the duration of the nations; and he would have discredited himself in the opinion of his own if he had taught them a

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<sup>23</sup> Howell 1996; 2002, Ch. 6.

history contrary to that which she [his own people] must have learned in Egypt.<sup>24</sup>

*Separation of the Hebrew kingdom into Northern and Southern Kingdoms*

Similarly, in the *Recherches sur les ossements fossiles* of 1812 he took the separation of the Hebrew kingdom into Judah and Israel under Jeroboam as historical fact and used it to date the origin of the Pentateuch to before the separation:

The Pentateuch has existed in its present form at least since the schism of Jeroboam, because the Samaritans as well as the Jews accept it, which means that it is certainly now more than twenty eight hundred years old. There is no reason at all not to attribute the redaction of Genesis to Moses himself which would date it to five hundred years earlier.<sup>25</sup>

This separation is now estimated to have occurred before 900 BCE.

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<sup>24</sup>“Moïse et son peuple sortoient d’Egypte, qui de l’aveu de toutes les nations d’occident, est le royaume le plus anciennement civilisé de tous ceux qui entourent la Méditerranée. Le Législateur des Juifs n’avoit aucun motif pour abrégér la durée des nations; et il se seroit discrédité lui-même auprès de la sienne, s’il lui eût enseigné une histoire toute contraire à celle qu’elle devoit avoir apprise en Egypte.” Cuvier 1812, vol. 1, 95.

<sup>25</sup>“Le Pentateuque existe sous sa forme actuelle au moins depuis le schisme de Jéroboam, puisque les Samaritains le reçoivent comme les Juifs; c’est-à-dire, qu’il a maintenant à coup sûr plus de deux mille huit cents ans. Il n’y a nulle raison pour ne pas attribuer la rédaction de la Genèse à Moïse lui-même, ce qui la feroit remonter de cinq cents ans plus haut.” Cuvier, 1812, vol. 1, 94-95.

*Moses as author of the Pentateuch*

While the French ‘*rédaction*’ in the preceding quotation can refer to authoring as well as editing a text, the reference to Egyptian sources in the Exodus quotation indicates that Cuvier saw Moses as the editor of the Pentateuch. To understand Cuvier’s view of Moses and the meaning of his use of the Pentateuch we need to have some context.

## HISTORICAL CRITICISM OF THE BIBLE

*Cuvier adopts Eichhorn’s argument for the antiquity of the Pentateuch*

In 1812 Cuvier’s interest in the historicity of the Pentateuch shows in a reference to J. G. Eichhorn’s 1803 edition of the *Introduction aux livres de l’Ancien-Testament* for support on the historicity of the Exodus.<sup>26</sup> Johann Gottfried Eichhorn (1752-1827) was an Old Testament scholar in the neologist school.<sup>27</sup> The reference to Eichhorn occurs when Cuvier is arguing that all known traditions, including the Pentateuch, date the renewal of society back to a large catastrophe. The argument cited above that dates the Pentateuch to before the separation of the Hebrew kingdom into northern and southern parts was adopted from Eichhorn.<sup>28</sup> He argued that

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<sup>26</sup>Cuvier 1812, vol. 1, 94 refers to Eichhorn 1803; Eichhorn *Einleitung* 1780-83, 1787<sup>2</sup>, 1803<sup>3</sup>, 1823-4<sup>4</sup>. On J. G. Eichhorn, see Kraus 1956, 125-140 and Rogerson 1984, 15-27.

<sup>27</sup>For a characterization of Neologism see Bray 1996, 257-63, Kraus 1956, 94-102, Rogerson 1984, 16-18.

<sup>28</sup> Cuvier 1812, vol. 1, 94-95.

since the Samaritans descended from the northern kingdom Israel, and lived in enmity with the southern kingdom Judah, it was unlikely that they would have adopted the Pentateuch from Judah. So they must have shared it before the separation and this dates the Pentateuch to at least that time.<sup>29</sup> Cuvier adopted Eichhorn's argument for the antiquity of the Pentateuch despite the severe criticism levelled at it by Wilhelm Martin Leberecht De Wette (1780-1849), a contemporary of Eichhorn and Cuvier and a representative of higher biblical criticism who had argued that the Pentateuch was younger than the prophetic books.<sup>30</sup>

*Cuvier prefers the patristic principle of accommodation over Eichhorn's*

Cuvier did not adopt Eichhorn's views uncritically. According to the patristic principle of accommodation, divine revelation was adapted to the spiritual weaknesses and the cognitive limitations of the recipients and, therefore, offered in the popular *language* of everyday experience.<sup>31</sup> For the church fathers this language did not express religious experience or stage of progressive cultural development. Rather it was a divine pedagogical strategy intended to deepen the spiritual maturity of the Israelites in the course of history. In contrast, according to Eichhorn, the authors had rendered their religious experience using the child-like thoughts, images and language of a culture in the beginning stages of development.<sup>32</sup> As we have seen, Cuvier relied

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<sup>29</sup>Eichhorn 1780-83, vol. 2, 131 ff, 251 ff.

<sup>30</sup>Rogerson 1984, 32; Houtman 1994, 86-87.

<sup>31</sup>Benin 1993, 10-13.

<sup>32</sup>Eichhorn 1787 (2<sup>nd</sup> ed.), vol. 1, III, 13, 18; vol. 2, 331, 345; *Urgeschichte*, vol. 2, 24,

on the cognitive and linguistic aspects of the patristic principle of accommodation which pre-dates Eichhorn's use of accommodation based on stages of progressive cultural evolution.<sup>33</sup>

There was improvement in understanding natural phenomena, but Cuvier did not characterize human understanding in times past as primitive or child-like as Eichhorn did.<sup>34</sup> This suggests that his 1812 reference to Eichhorn in support of the Mosaic editorship of the Pentateuch cannot be interpreted as a general agreement with Eichhorn's neologist brand of historical criticism, let alone with the tradition of historical criticism in general. But there is more that points to a traditional view of the Pentateuch.

#### CUVIER USED THE PENTATEUCH AS A STANDARD TO ASSESS OTHER SOURCES

Cuvier did not just take the Pentateuch as any other source of information about natural history, earth history and the history of civilizations. In contrast, he used the Pentateuch as standard of evaluation of other ancient sources, treating the Scriptures as historically more reliable. After observing Cuvier's use of the Pentateuch Negrin (1977) concluded that "It is [ ] difficult to agree that the 'Pentateuch is just one among many' ancient sources presented as evidence for the chronology of human society." Rather,

The Pentateuch is quite naturally presented first, but, somewhat less naturally, it

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62n26; Rogerson 1974, Ch. 1.

<sup>33</sup> Funkenstein 1986, 213-271.

<sup>34</sup> The limitations of sensation and understanding had Cuvier's attention in other ways as well. See Letteney 1999, 388-396.

remains normative, the reference point and standard for evaluating the accuracy of other sources. [ ] For example, references in the Vedas to a flood occurring many thousands of years ago are contemptuously dismissed, whereas references to a flood occurring a little less than 5000 years ago are given a respectful reading.<sup>35</sup>

Negrin (1977) also noted that Cuvier accepts the existence of astronomical knowledge pre-dating Noah's Flood. In doing so Cuvier presupposes that the Pentateuch can provide grounds for the evaluation of historical information. Cuvier can do this, Negrin concludes: "... for on scientific and Scriptural grounds there is no basis for denying the existence of pre-diluvial man."<sup>36</sup>

Outram (1984) and Rudwick (1972, 1997, 2005) on the other hand argue that Cuvier treated the Bible as any other book.<sup>37</sup> One reason for the difference in assessment with Negrin (1977) is, I suggest, that Outram (1984) and Rudwick (1972, 1997) used the 1<sup>st</sup> French edition of the *Preliminary Discourse* of 1812 while Negrin used the 6<sup>th</sup> French edition of 1830.<sup>38</sup> The 1<sup>st</sup> edition of 1812 has been translated by Rudwick (1997). In it Cuvier does not use the Pentateuch as a standard for the evaluation of other ancient sources.<sup>39</sup> This evidence appears in the second French edition of 1821 and continues in the 3<sup>rd</sup> French edition of 1825. Rudwick (2005) discussed Cuvier's revisions of 1821, but not his standards of evaluation of other ancient

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<sup>35</sup>Negrin 1977, 296-297.

<sup>36</sup> Negrin 1977, 299.

<sup>37</sup> Outram 1984, 148-149; Rudwick 1972, 134; 1997, 181; 2005, 594.

<sup>38</sup> Negrin 1977, 281n1; Outram 1984, 141; Rudwick 1997, 275.

<sup>39</sup> Rudwick 1997, 183-252.

sources.<sup>40</sup>

*Cuvier's standards for the evaluation of other ancient sources*

What criteria did Cuvier use in 1821 to identify a source as a reliable standard? First, he prefers written record over oral tradition. This narrows the collection of reliable sources down to all ancient written records including the Pentateuch. The second criterion is agreement on historical facts between different written records. If two documents agree they do so because they have a common source. Cuvier does not address the problem that would arise if document A agreed with B because B has been copied from A including mistakes. Thirdly, Cuvier demands agreement of ancient descriptions of natural phenomena with contemporary observation. Finally, he rejects texts that confuse facts with naive and extravagant ideas.<sup>41</sup> For instance, the Egyptian records reported by Herodotus in 'The Histories' are rejected because they describe a sun that rises and sets twice a day which contradicts experience:

....and in total there were until Sethos, three hundred and forty one kings and three hundred and forty one chief priests, in 341 generations, during 11,340 years, and in that interval, as guarantee for their chronology, these priests assured that the sun would have risen twice where it sets, without anything changed in the climate

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<sup>40</sup>Rudwick 2005, 620-22.

<sup>41</sup> Cuvier 1825, 168, 179, 186 (criterion 1), 196, 198, 200 (criterion 2), 189 (criterion 3), 200 (criterion 4)

or in the production of the land,...<sup>42</sup>

He concludes: “It seems to me infinitely more natural to conclude that the Egyptian priests have no history;...”<sup>43</sup> The lack of reliable information is blamed on the fact that the records were authored by a few priests whose interest in self-perpetuation is assumed to have led to distortions.<sup>44</sup> In Cuvier’s judgment none of the written records of Egyptian, Indian and Assyrian origin satisfies these criteria and so he rejected them as unreliable sources of historical information.<sup>45</sup>

#### *Cuvier’s use of his criteria*

Remarkably, Cuvier’s assessment of knowledge about ancient civilizations excludes the historical books in the Old Testament such as the Pentateuch, Kings and Chronicles. The only criterion for the evaluation of ancient sources applied by him is the problematic one. Cuvier

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<sup>42</sup> “...et au total il y eut, jusqu’à Sethos, trois cent quarante-un rois et trois cent quarante-un grand-prêtres, en trois cents quarante-un générations, pendant onze mille trois cent quarante ans, et dans cet intervalle, comme pour servir de garant à leur chronologie, ces prêtres assuraient que le soleil s’était levé deux fois où il se couche, sans que rien eût changé dans le climat ou dans les productions du pays, ...” Cuvier 1825, 193.

<sup>43</sup>Ibid., 200-01: “..., il me semble infiniment plus naturel d’en conclure que les pretres egyptiens n’avaient point d’histoire; ..”.

<sup>44</sup>Ibid., 189.

<sup>45</sup>Ibid., 180-211.

writes that the Egyptian records can be trusted starting with those of Sethos because they agree with the Hebrew records:

It is not until Sethos that a somewhat reasonable history begins in Herodotus; and it is important to note that this history begins with a fact that agrees with the annals of the Hebrews, with the destruction of the army of the king of Assyria, Sennacherib; and this agreement continues under Necho and under Hophra or Apries.<sup>46</sup>

This argument assigns equal reliability to two documents, “The Histories” of Herodotus and the Pentateuch, based on mutual agreement about historical facts. Cuvier neglected the possibility that errors might have been copied from one document to the other or from an earlier source. If Cuvier believed with Eichhorn that Moses got his history of the ancient world from the Egyptians,<sup>47</sup> one would expect Cuvier to conclude that the Pentateuch was as unreliable as its Egyptian sources which could be demonstrated to be distorted by the Egyptian priests. In drawing this conclusion, however, Cuvier is uncharacteristically uncritical with respect to the Old Testament.

Moreover, he does not even apply his other criteria. In the third edition of the *Discourse* Cuvier maintains total silence on the reliability of the Old Testament with respect to natural and

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<sup>46</sup>Ibid., 195: “Ce n’est qu’a Sethos que commence, dans Herodote, une histoire un peu raisonnable; et, ce qu’il est important de remarquer, cette histoire commence par un fait concordant avec les annales hebraiques, par la destruction de l’armee du roi d’Assyrie, Sennacherib; et cet accord continue sous Necho et sous Hophra ou Apries.”

<sup>47</sup>Eichhorn 1787 (2<sup>nd</sup> ed.), Vol. 1, 7-8, 10.

historical events. For instance, he illustrates the lack of reliable information about king Cyrus by reporting that Herodotus refers to three different opinions about Cyrus, and that his biography of Cyrus disagrees with that of Xenophon, but he fails to consider the seven Bible passages that refer to a king Cyrus.<sup>48</sup>

Also, the absence of any critique of the historical books of the Old Testament, particularly of the lists of kings stands out against a pervasive critique by Cuvier of such lists in other ancient sources such as the *Vedas*.<sup>49</sup>

Further, the Pentateuch fails to agree with current observation, for instance, on the age of the patriarchs after the Flood which runs into the hundreds of years. The interruption of the rotation of sun and moon cannot be counted as a disagreement with current observation because Cuvier himself took the relevant text as a case of divine accommodation.<sup>50</sup>

Finally, the Old Testament could be said to confuse fact and fiction, for instance, in the story of the speaking snake in the book of Genesis.<sup>51</sup> Cuvier is silent on the fact that the Old Testament fails to meet all, but one of his criteria for reliability, i.e., the preference for written records.

### **Table 1: The Selective Application of Evaluation Criteria to the Old Testament by Cuvier**

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<sup>48</sup>Cuvier 1825, 207-208. 2 Chr 36,22; Ezra 1,1; 4,3 and 5,13; Isaiah 44, 28 and 45, 1 and Daniel 1, 21.

<sup>49</sup>Ibid., 182-91.

<sup>50</sup> Genesis 11 and Joshua 10: 12-13.

<sup>51</sup> Genesis 3.

<b>Cuvier's Evaluation Criteria</b>	<b>Pentateuch</b>	<b>Kings</b>	<b>Chronicles</b>
Written records preferred over oral tradition	+	-	-
Agreement on historical facts between different written records	+	-	-
Agreement of ancient descriptions of natural phenomena with contemporary observation	-	-	-
Texts that confuse facts with naive and extravagant ideas rejected	-	-	-

What needs to be explained is this silence. One possibility is that biblical archeology had not produced any information about the history and culture of the Hebrews worthy of consideration. This can be excluded because that would also apply to the archeology of other near eastern countries which he discusses in detail. What needs to be explained is that when dealing with the Old Testament Cuvier abandoned the legendary impartiality which characterized his handling of the facts of natural history as well as those of the history of civilizations and of the affairs of government. I suggest the explanation is that Cuvier believed the Pentateuch is reliable because he believed it is divinely inspired. His acceptance of the Augustinian principle of accommodation and more specifically of a different chronology for geology than that offered by the Old Testament indicate, however, that his acceptance of a divinely inspired Bible did not imply that it had to be interpreted literalistically. Cuvier tried to steer a middle way between the literalism of Scriptural geologists and the liberalism of higher criticism. This was a perfectly respectable position because the tide in France during and after the Empire was against social and political extremism.

## CONTEXTS

*The Empire*

Napoleon pursued social and political stability to solidify his Empire (1799-1814). To this end he established agreements with the Catholic and Protestant churches. As a member of the *Institut* Cuvier had direct contact with Napoleon who in 1799 had himself appointed member of the First Class of the *Institut* dealing with the Natural Sciences. Anything Cuvier said in meetings of the *Institut* would have been said in the presence of Napoleon. Public lectures elsewhere would have been communicated to him. There was an incentive for Cuvier not to be seen as a religious extremist either to the left or the right.

In 1802 the Concordat between the French State and the Roman Catholic Church created a more favourable climate for religious expression and accusations of materialism and atheism became serious charges. French Protestants received improved civil rights in 1802. In that same year the literal reading of Moses became a hot issue in France. In his “Genius of Christianity” François-René de Chateaubriand (1768-1848) dismissed scientific objections to a literal reading of Moses. François-Dominique de Reynaud Montlosier (1802) and Nicolas Desmarest (1803) revived a vast timescale and were suspected of ‘eternalism.’<sup>52</sup> In this climate Cuvier offered his first public lectures on geology. They were presented in 1805 at the Athénée des Arts, and for a wider audience than at the Museum or the *Institut*. Important first claims included the concordance between Genesis days and the epochs in geology following de Luc, and a date for

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<sup>52</sup>Rudwick 2005, 450; Montlosier 1789; Desmarest 1803.

the last catastrophe that was compatible with Noah's Flood.<sup>53</sup>

### *Reception of Cuvier's 1805 lectures*

These lectures were widely perceived not only as a loss for the atheists, but also as an attempt to conform to the 3 years old rapprochement between the state and the Roman Church. In his lecture notes the Italian naturalist Giuseppe Marzari Pencati (1779-1836) joked that Cuvier was "on the look out for a cardinal's hat."<sup>54</sup> This was a reference to the revival of biblical literalism among the Catholics under the influence of Chateaubriand. But Marzari Pencati explicitly stated that he did not mean to question Cuvier's integrity.<sup>55</sup>

### *Interpretation of Cuvier's 1805 lectures*

Cuvier's sincerity can be confirmed by distinguishing between what occasioned Cuvier's use of the Bible and the content of the information on natural history and earth history taken from it. Among others Cuvier used the Bible to interpret the fossil record as of recent origin. This has been explained as a two-pronged attack on Lamarck. Cuvier exposed Lamarck's idea of gradual organic transformation as dubious and Lamarck himself as irreligious. Dubious because the Bible did not provide enough time for the evolutionary development proposed by Lamarck. Irreligious

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<sup>53</sup>Rudwick 2005, 447-8.

<sup>54</sup>Marzari Pencati 1805.

<sup>55</sup>On Cuvier's sincerity, see Corsi 1988, 181-82.

because Lamarck's theory implied a rejection of this biblical frame of history. This exposed him as an anti-religious materialist.<sup>56</sup> In this case, the timing of Cuvier's *use* of the Bible as a source of historical information may be interpreted as a political manoeuvre designed to discredit Lamarck because this information was offered to a popular audience of the geology course he taught in 1805. Moreover, Cuvier had positioned himself as a defender of middle-of-the-road religious orthodoxy thereby distancing himself from religious fanatics such as Chateaubriand who were seen as a threat to social stability. Napoleon would have been pleased.

However, his use of the Bible as a source of information about natural history and earth history cannot be reduced to a means of swaying public and political opinion against Lamarck because it predates the political circumstances and because he risks being excluded from the circle of professional scholars by exposing his use of the Bible to them. First, this use predates Cuvier's exposure to transformism. For instance, in a 1790 letter to Pfaff he gave a species definition in terms of his belief that God had created an original pair for each type of organism. This was repeated in the 1828 volume 1 of his *Histoire naturelle des poisons*.<sup>57</sup> Moreover, both the letter and the *Histoire naturelle des poisons* were exposed to professional scholars. This also applies to the *Recherches sur les ossements fossiles* of 1812 in which Cuvier presents his views on the historicity of the Pentateuch to professional geologists and paleontologists across Europe and beyond. Taking such a professional risk can be explained only if the information on biological species, natural history and earth history taken from the Bible was more to Cuvier than

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<sup>56</sup>Corsi 1988, 184.

<sup>57</sup>Letter to Pfaff dated August 22/23, 1790 in Behn 1845, 172; Cuvier and Valenciennes 1828-33, vol. 1, 543.

a political tool. The risk was not imagined. In 1816 colleagues siding with Cuvier against Geoffroy did not appreciate the introduction of religious arguments into what they saw as a scientific issue.<sup>58</sup>

My conclusion is that while the content of Cuvier's views did not change much, their exposure to public view in 1805 was a function of the circumstances in which he found himself. He may have felt that the socio-political circumstances called for the middle way he had held long before, and that he could risk presenting it also in professional circles at least in France because they themselves could not risk being seen on the extreme left by opposing Cuvier. So I agree with Rudwick (2005) who sees the 1805 lectures as rejecting both a young earth and an eternal earth. Cuvier rejected the young earth in the biblical literalism of Chateaubriand because it did not grant geology enough time. He declined the 'eternal' earth of his colleagues because it gave geology no passage of time and because of the anti-normative social implications suspected behind the vast timescale indicated by geological fieldwork of Montlosier (1802), Demarest (1803) and Lamarck (1805).<sup>59</sup> The Augustinian principle of accommodation provided the perfect vehicle for the middle road. It allowed Cuvier to be seen as holding the divine authority of the Bible and of its moral message while avoiding the literalism of Chateaubriand and of the scriptural geologists.

Likewise I suggest that the enlarged treatment of ancient civilizations in the 2<sup>nd</sup> as compared with the 1<sup>st</sup> edition of the *Preliminary Discourse* does not signal a change of heart on

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<sup>58</sup>The occasion is the publication in 1816 of the *Dictionnaire des sciences naturelles* in which Cuvier criticized Geoffroy's idea of a single 'plan of composition,' Corsi 1988, 220.

<sup>59</sup>Rudwick 2005, 448-56.

Cuvier's part. Cuvier may have been prompted to strengthen the case for a relatively recent flood in the face of public claims that it was far older and that the Biblical record was not reliable on this point as Rudwick has suggested.<sup>60</sup> But Cuvier's earlier use of the Pentateuch in earth history and natural history indicate that he believed all along that it has divine authority. This is confirmed by comparing Cuvier's views of the Pentateuch with those in contemporary neologism and higher biblical criticism.

### *Neologism and Higher Biblical Criticism*

Cuvier's view of the Pentateuch must be interpreted in comparison with contemporary biblical scholars. Take the question of divine relative to human involvement in revelation. Neologists such as Johann Salomo Semler (1725-1791), Johann Gottfried Eichhorn (1752-1827), Johann Philipp Gabler (1753-1826) and Karl David Ilgen (1763-1834) attributed the content of revelation to divine action and the form to the stage of cognitive-psychological and cultural development of the Israelites. Divine content was seen as mediated by natural means such as religious experience.<sup>61</sup> The relationship of the natural and the supernatural contributions to religious experience was expressed in the concept of 'myth.'<sup>62</sup> Unlike the Neologists, higher biblical critics such as Wilhelm Martin Leberecht De Wette (1780-1849) saw myth as an

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<sup>60</sup>Rudwick 2005, 621.

<sup>61</sup>Kraus 1956, 135-36, Dyson 1982, 56-7.

<sup>62</sup>For Eichhorn on myth see: Eichhorn 1790-1793; Eichhorn, 1787<sup>2</sup>, vol. 1, III, 13, 18, vol. 2, 331, 345; Kraus 1956, 139; Rogerson 1984, 17-18.

exclusively natural and purely human vehicle by which they could express philosophical and religious ideas in poetic form and transcend history.<sup>63</sup> In the comparison of Semler and Eichhorn with De Wette the relative contribution of the divine and the human author to the text shifts until religious experience replaces divine revelation. In contrast, in Cuvier's Augustinian type of accommodation it is the divine author who condescends to the use of ancient cultural forms as a vehicle of revelation.

The same comparison also highlights a progressive reduction of reliability in their assessment of the Pentateuch as historiography. This is complemented by increasingly naturalistic interpretations of the religious development of Israel. For instance, Eichhorn's attempts to uncover the religious history of Israel by removing myth assumes that the text contained elements of history that can be recovered. According to De Wette, the Pentateuch is a poetic reflection on the past with no possibility to recover a historical basis. In contrast, Cuvier used the Pentateuch as a standard to assess other ancient sources for the history of civilizations. His use of the Augustinian principle of accommodation allowed him to treat the Flood story as an historic catastrophe of which his geological work had revealed the physical traces.

Cuvier's aversion to higher biblical criticism is further revealed in what he shared with Eichhorn. Both Eichhorn and Cuvier believed that Moses gave a legal system to the Israelites, and that this system together with the rest of the Pentateuch originated before the division of Israel. But De Wette and other biblical scholars in the 1790s severely criticised an early date for the Pentateuch.<sup>64</sup> In these respects Cuvier's views of the Pentateuch were distinctly more

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<sup>63</sup>De Wette 1817, 259.

<sup>64</sup>Rogerson 1984, 29, 32-33, Houtman 1994, 86-87.

conservative than those of higher biblical criticism.

Further, Cuvier relied on Eichhorn only for his view that the Pentateuch is based in historical fact. He did not accept Eichhorn's psychological view of divine accommodation nor the associated developmental interpretation of religious history even though it maintained the idea of a transcendent revelation. Thus in taking the Pentateuch as a standard for reliable history Cuvier is decidedly more conservative than Eichhorn. His preference for the Augustinian over the Eichhornian view of divine condescension shows that for Cuvier the Pentateuch is both divine and human in the classical Augustinian sense. Clearly, Cuvier does not belong in the school of higher biblical criticism and he is selective in his attitude towards Neologism.

To evaluate Cuvier's position on higher criticism, it is also important to recall that the historical criticism of the eighteenth century had been absorbed by the Christian community in the nineteenth century as a legitimate framework for reading the Bible.<sup>65</sup> In this light, Cuvier's use of Augustine's rather than Eichhorn's principle of accommodation and his distancing himself from eighteenth century historical criticism confirm that his view of the Bible was conservative.

## CONCLUSIONS

My first thesis was that Cuvier treated the Bible as a book with divine authority. Considering all his publications he used the Bible rarely. It happened when he gathered information about ancient civilizations and then he used it as any other book. But when in 1821 he evaluated the reliability of ancient writings other than the Bible he used the latter as a standard of reliability and he

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<sup>65</sup> Cameron 1987, 8.

characterized the story of Noah's Flood as accommodated history rather than legend or myth. The Augustinian principle of accommodation allowed him to interpret this story as referring to a local rather than global flood. His interest in the historicity of events recorded in Bible passages and their normative function in his textual criticism are in sharp contrast with their denial by contemporary scholars in the school of higher biblical criticism. This suggests that he was concerned not only about the moral and religious meaning of these texts, but also about their historicity. In that respect, Cuvier appears to have taken the classical Protestant position that the Bible is a book of faith as well as of nature and history, and that the reality of its events and phenomena grounds its religious meaning. This means that his use of the Bible as a book of faith and as a source for knowledge of the history of nations, organisms and the earth are not mutually exclusive.

My second thesis was that Cuvier did not accept higher biblical criticism. Outram (1984) interpreted Cuvier's treatment of Bible texts referring to creation and flood as an application of the documentary hypothesis which she took as a form of higher biblical criticism.<sup>66</sup> However, by itself, the idea that Genesis was assembled from different sources is not a criterion for adherence to the documentary hypothesis. Two centuries earlier, the Protestant reformer Martin Luther (1483-1546) had recognized that the book itself offers evidence for pre-existing sources.<sup>67</sup> One would have to show that Cuvier held the documentary hypothesis in its early or late form associated with higher biblical criticism. Outram (1984) made an attempt in that direction by suggesting that Cuvier likely viewed the account of the Flood in the Bible as a culturally-

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<sup>66</sup> Outram 1984, 149, 157.

<sup>67</sup>Luthers Werke: Weimarer Ausgabe 49, 2; 231.

conditioned legend along the lines of historical biblical criticism. In support, she points out that Cuvier makes

no face-saving remarks about the Biblical story of the creation being open to the interpretation that aeons rather than days could have passed between the creation of the world and the creation of life. This was an option that was perfectly open to him in the contemporary state of Biblical exegesis.<sup>68</sup>

But the suggestion that Cuvier interpreted the Flood narrative as a legend is inconsistent with the evidence that Cuvier viewed the Pentateuch as a source of facts and as a standard of reliability. Moreover, the two main harmonizations of the seven day creation week and geologic time on offer, that is the gap theory and the day-age interpretation, are not indicators of higher biblical criticism. Not only do they pre-date higher criticism<sup>69</sup>, but they were widely accepted by those who rejected higher criticism such as one of the leaders of the Oxford Movement in the Anglican Church Edward B. Pusey (1800-1882), the mathematician and pastor Herbert W. Morris (1818-1897) and Arthur Custance (1910-1985).<sup>70</sup>

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<sup>68</sup> Outram 1984, 156-7.

<sup>69</sup>While the gap theory was popularized by Thomas Chalmers in a lecture in 1814, the idea of a long period of time between Genesis 1: 1 and 2 was first introduced by the Dutch theologian Simon Episcopius (1583-1643) to accommodate the fall of the angels, and received scholarly treatment by J. G. Rosenmuller (1736-1815): Episcopius 1650, tom. I, 478-96; Rosenmuller 1776; See also: Rupke 2000, 403-4. For a history of the gap theory (restitution theory), see Bavinck 1928, vol. II, 454; Ramm 1954, 135ff, 172n26.

<sup>70</sup>On Pusey (1800-1882) see England, R. "Scriptural facts and scientific theories:

My final thesis was that Cuvier is not a Scriptural geologist because Augustine's principle of accommodation limited the speculative use of Bible texts in geology. If a text is phrased in unreflected common-sense language then whatever it is taken to be claiming calls for independent evidence. The application of this principle by Cuvier can be seen in that he requires independent empirical support for what he took as biblical assertions about civilizations, organisms and the earth. A text describing an event within an ancient cultural framework of understanding may serve as a starting point in geology and natural history, but it does not satisfy all that Cuvier requires of these sciences. This limitation on the usefulness of Bible texts was reinforced by Cuvier's aversion against speculation in general.<sup>71</sup> Outram (1984) also believes Cuvier is not a Scriptural geologist. She notes that, in a review Cuvier himself had argued that theological and scriptural speculation has damaged the growth of geology because (i) geological research problems had all been interpreted in terms of a single universal flood, (ii) the cause of the flood could not be determined because it was a miracle, and (iii) interpreting Noah's flood as the last in a series had led to an unfruitful proliferation of putative catastrophes.<sup>72</sup> Outram adds that Cuvier does not identify the last catastrophe with Noah's Flood. In my view, however, Cuvier's objections do not lead to Outram's conclusion when they are understood in the context of his distinction between responsible and speculative metaphysics. Specifically, Cuvier's critique of Noah's flood as an explanation of all features of the earth (i) was likely directed

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epistemological concerns of three leading English-speaking anti-Darwinians Pusey, Hodge and Dawson," (this volume) and Rupke 2000, 403-4; Morris 1877, 121-25; Custance 1989.

<sup>71</sup>Cuvier 1807, tr. in Rudwick 1997, 101-11.

<sup>72</sup> Outram 1984, 147-48.

against the speculation that had damaged the growth of geology, not the fact that this speculation originated in the Bible or in theology. How else could one explain that he used the passage about the Flood as a fact about the history of the earth.<sup>73</sup>

(ii) As for miracles in nature, Cuvier did not explain natural phenomena or historical episodes as the result of God's miraculous action because this was too speculative. In this sense for Cuvier "... the use or justification of individual theological arguments in their literal form was not a part of his study."<sup>74</sup> Coleman (1964) was referring to the use of Bible texts. He concluded that while Cuvier was religiously motivated there were no religious arguments in Cuvier's work. However, there are other entries for religion. Cuvier did use Bible passages either as givens or as definition in explanations of natural phenomena. He took a geological catastrophe such as the Flood as a fact that could function responsibly as a given in geological explanation in the same way as the exodus of the Hebrews from Egypt could be part of an account of the history and culture of Israel as a nation. Cuvier used the same approach in natural history when he gave a species definition in terms of his belief that God had created an original pair for each type of organism including humans. He also considered Form as a given that functioned in the explanation of the correlation of the parts of an organism.<sup>75</sup> One could not know the primary cause of these givens, but the givens themselves could function as causes in explanation.

(iii) The problem with too many putative catastrophes does not necessarily lie with the example of Noah's Flood, but with the speculative use of this idea. Further, as I have already

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<sup>73</sup> Cuvier 1812, 95.

<sup>74</sup> Coleman 1964, 181.

<sup>75</sup> van der Meer 2005.

indicated, Outram's separation thesis is unable to account for the role of the theological view that God's goodness and wisdom are manifest in the creation particularly in the orderliness of all natural phenomena as well as in the purposiveness and diversity of animals (van der Meer 2005). Cuvier's objections do not lead to Outram's conclusions because contrary to Outram's assertion Cuvier did not devote his review to the harmful impact of theological and scriptural speculation on the growth of geology, but to the adverse effects of speculation in general as indicated by the inclusion of objections to reasoning based on few or partial observations and to an unlimited increase in the number of inundations.<sup>76</sup>

In sum, Cuvier treated the Bible both as a book with divine authority and as a source of information about nature and history. In doing so, he distanced himself not only from higher biblical criticism of the naturalistic kind, but also from the emphasis on religious experience in neologists such as Eichhorn. For Cuvier the Augustinian principle of accommodation which pre-dates historical criticism sufficed to keep scripture and geology relatively separate as his interpretation of texts on Noah's flood and on Old Testament chronology indicate. Cuvier also distanced himself from a speculative geology based solely on Bible texts, but not from what he considered as the responsible use of Bible texts as givens in accounting for the features of the earth, of organisms and of ancient civilizations. This use was limited by an awareness of the accommodated nature of the texts and called for the development of a stronger empirical alternative based on the standard belief that God's work in nature agrees with that in scripture. Cuvier's responsible use of Bible texts, or of metaphysical ideas for that matter, is characterized by an insistence that the matter under consideration can stand on its own empirical feet. This

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<sup>76</sup>Cuvier 1807, tr. in Rudwick 1997, 104.

means that Cuvier is not a scriptural geologist. At most, the general idea of geological catastrophes may have been inspired by the story of the Flood, and the definition of biological species by the story of creation. In this way Cuvier developed a middle position regarding biblical interpretation and its relation to geology and natural history. This position could support another middle of the road view which Rudwick has shown he developed with respect to the possibility of geological history. The available geological evidence showed that a history of the earth required more time than allowed by the biblical literalism of Chateaubriand and excluded the steady-state eternalism of Lamarck.<sup>77</sup>

According to Outram, Cuvier could not have allowed his religious thought to contribute to his geology because in his view religion was irrational while science was rational.<sup>78</sup> Outram's sources, however, indicate that Cuvier did not consider religion as a whole to be devoid of reason. In contrast, Cuvier was referring to irrational elements in specific religious beliefs or to the irrational actions of religious individuals. In a letter about a controversy associated with the French Awakening Cuvier indicated that religion had room for rational argument when he endorsed a moderate doctrine of grace that sought "to explain Holy Scripture from a rational point of view."<sup>79</sup> Also, Cuvier's criticism of Priestley referred to the irrational consequences Priestley drew from his religious beliefs such as his denial of established church doctrine and his defiance of ecclesiastical authority as well as to the speculative nature of his metaphysics which

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<sup>77</sup>Rudwick 2005, 445-56.

<sup>78</sup> Outram 1984, 147.

<sup>79</sup> Undated letter by Cuvier in the Guillaume Monod dossier, Archives Nationales, F<sup>19</sup> ("Cultes"): 10435. Negrin 1977, 250 estimates this letter is from late Nov. or early Dec. 1829.

Cuvier contrasted with the demonstrative powers of ‘true metaphysics.’<sup>80</sup> It would not have been irrational for Cuvier to allow his geology or his zoology to be influenced by the Bible whether by general religious perspectives or by isolated Bible texts interpreted in light of the Augustinian principle of accommodation.

Why were questions about the relationship between religious belief and natural history in Cuvier cast primarily in terms of the relation between the exegesis of the Bible and geology? Outram (1984) has suggested this happened because Cuvier’s contemporaries as well as historians of science focused their interest on the *Preliminary Discourse*. On the face of things this does not explain the situation because the *Preliminary Discourse* contains more examples of the use of general perspectives on nature inspired by the Scriptures than of the use of isolated Bible passages. This difference is even more pronounced when the entire four volumes of the *Recherches sur les ossements fossiles* is considered.<sup>81</sup> I suggest that the focus on Bible and geology among historians of the science of Cuvier was introduced by the Scriptural geologists among the British Natural Theologians because they were interested in the use of the Bible in the *Preliminary Discourse*. A concern for scriptural interpretation may seem unexpected in a tradition known for proofs of the existence of God by natural reason from natural evidence.

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<sup>80</sup>Cuvier accuses Priestley of speculative metaphysics which includes explanations of things hidden from human reason such as the soul: Cuvier 1819-27, vol. 1, 211, 215 reproduced in Cuvier 1861, vol. 1, 133, 136 .

<sup>81</sup>Cuvier 1812: for the biblicistic tradition, see vol. 1, 94-5; for the perspectival tradition, see vol. 1, 1, 58, 60-61, 63. Only the perspectival tradition is present in vol. 3, 2, 3 and vol. 4, 32, 36.

However, a growing awareness that the earth and its inhabitants had a history made it necessary to point out that God had a hand in it. Moreover, the very idea of divine design itself, when limited to nature and interpreted deistically, called forth the need to identify divine intervention in the moral history of people. The Flood was such a morally significant event.<sup>82</sup> These needs made it necessary for natural theologians to refer to the Bible.

The context for my suggestion is the debate between proponents of the primacy of form and function in biological explanation. The teleologists understood organisms in terms of their function which they interpreted as purpose while the so-called transcendental morphologists believed animal structure to be most important. Russell (1916), Ospovat (1978, 1981) and Amundsen (1998) have shown that this context is crucial for an understanding of nineteenth century biology. It just so happened that Cuvier and the British Natural Theologians shared the teleological approach. The latter did not hesitate to co-opt Cuvier for their purposes and alter his writing in the process. For instance, in the following ‘translation,’ the editor of the *Edinburgh journal of natural history* added without apology the expression ‘by the Creator’ to the following line written by Cuvier: “Instinct has been wisely bestowed upon animals *by the Creator*, to supply the defects of their understandings, the want of bodily force or fecundity; and thus the continuation of each species is secured to the proper extent.”<sup>83</sup> Preoccupied as they were

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<sup>82</sup>Gillispie 1959, 38, 40, 96, 105-6, 147, 220-1; Greene 2003, 144, 151.

<sup>83</sup> Italics mine. Original in Cuvier 1817, vol. 1, 54: “L’instinct a été accordé aux animaux comme supplément de l’intelligence, et pour concourir avec elle, et avec la force et la fécondité, au juste degré de conservation de chaque espèce.” English translation in Cuvier 1839-1840, 13. Other examples in Cuvier 1827-1835, vol. 1, xi; Page 1969; Rudwick 1972, 132-135 on editing

with Scriptural geology the British Natural Theologians interpreted Cuvier as one of their allies in that respect as well. I suggest that this one-sided emphasis on the relationship between Bible and natural history in the historiography of Cuvier was introduced by British Natural Theologians and has entered the studies by Coleman (1964) and Outram (1984). Outram (1984) tried to move away from it by asking what Cuvier's religious beliefs really were. She argued that Cuvier was an unlikely champion for the Mosaic account of notable geological events such as the Flood. However, since it was not her intention to deal with Cuvier's general beliefs about nature, this discussion emphasized once again the biblicistic tradition which she found Cuvier had rejected in geology in 1807 and perhaps as early as 1791.<sup>84</sup> This is why Outram (1984) mistakes Cuvier as pursuing the ideal of a science liberated from religion. Cuvier followed the traditional Augustinian approach and walked between the biblicism of Scriptural geology and the criticism of liberal theology.

According to Outram (1984), Cuvier was an unlikely champion for the Mosaic account of notable geological events such as the Flood based on what she perceived as an absence of a spiritual life. In contrast, my claim that the Bible functioned in Cuvier's scholarship presupposes that Cuvier had a spiritual life. Characterizing anybody's spiritual life is a precarious endeavour at best and is beyond the scope of this paper. Suffice it to say that he had extensive theological and religious knowledge and that he was a practicing Lutheran throughout his life. Cuvier was

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by Robert Jameson.

<sup>84</sup> Outram 1984, 147. In a letter to Pfaff, October 1791 in Behn1845, 248, Cuvier explains alternating layers of chalk and silica near Fécamp, Normandy as the result of successive precipitations from seawater which he envisioned as having covered the entire earth.

exposed to religious practice and theological knowledge via his family members, his elementary school teachers, and his instructors at the Gymnasium of Montbéliard and the Caroline Academy in Stuttgart many of whom had studied and/or worked at the University of Tübingen.<sup>85</sup> “Cuvier [ ] commented that whereas literary and theological subjects were highly esteemed and often cultivated with intelligence and learning in his native town, an interest in natural history was regarded as a harmless pastime at best.”<sup>86</sup> Many of the professors moved between the Caroline Academy and the University of Tübingen. Together with elementary and secondary schools, these two institutions functioned as a single religious and intellectual community. The theological relatives of Cuvier who participated in this community included the generation of his

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<sup>85</sup>For Cuvier’s youth in Montbéliard, see Debard 1982; Taquet 2006. A description of his education at the Caroline Academy and the influence of the Tübingen seminary will be included in a description of Cuvier’s theology of nature to be published elsewhere. For Cuvier’s extensive work on behalf of Protestant churches in France, see Negrin 1977, 225-277. As a member of the Bible Society of Paris he supported it with 50F annually between 1818 and 1832 (Macler 1932, 254). On the occasion of the death of his daughter Clémentine, Cuvier donated 100 French Francs for the poor (Registre des Procès-verbaux du Consistoire, volume C, Séances du 15 Janvier 1819 au 22 Juillet 1831, 425, No. 12, dated 5 Octobre 1827; The minutes of the Consistory are located at the Lutheran Archives Centre, Bureaux de l’inspection de l’église évangélique Luthérienne de France (E. E. L. F.), 16, rue Chauchat, arrondissement 9, Paris. ). In response to a letter of the Consistory, dated April 9, 1832, Cuvier donates 60F for victims of cholera (Lutheran Archives Centre, Paris: untitled notebook listing donations).

<sup>86</sup> Marchant 1858, 59-60 (Letter of October 1788).

parents as well as his nephews and cousins. It would have been surprising if Cuvier had not been well informed in matters spiritual, theological and philosophical.