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THE FLOOD IN GENESIS: WHAT DOES THE TEXT TELL GEOLOGISTS?

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ABSTRACT

Among the issues most critical to a diluvialist interpretation of the geological record are exegetical ones affecting our understanding of the historical record. How much of the earth was destroyed? How thoroughgoing was the destruction? What were the fountains of the deep? How long was the earth under water? How long was the period of drying off? Where were the mountains of Ararat? These questions are examined in the interest of defining what preconceptions we ought to bring to the geological record.

INTRODUCTION

Efforts over the past thirty years to match the scriptural record of the Flood with the geological record have not, in my judgement, been particularly successful, my own efforts not excepted. In large part this failure may be attributable to inadequate knowledge of, and acknowledgement of, the geological data, much of which is irreconcilable with current Flood models [19]. It may also be due to unwillingness to admit the possibility of failure, for fear that this would throw in doubt the veracity of the scriptural record itself. Consequently, much diluvialist argument has, until now, consisted in attempts to undermine the fundamentals of geological interpretation, on the premise that data interpreted from a diluvialist point of view (i.e. from the view of one's preferred Flood model) will be data in harmony with the scriptural record. Much explanatory power is forfeited in this approach, since one has to be convinced of the Flood model first, and one then 'proves', in effect, what one presupposes. The fundamentals of geological interpretation are in any case more secure than attackers realise [18]. The purpose of the present paper is to guard against the possibility that the failure to identify the Flood in the geological record results, rather, from erroneous interpretation of the scriptural data. In principle, geological models ought to be subject to, and so far as possible derived from, the scriptural data. The Flood in Genesis is the historical 'given'. The nature of that event must be understood independently of geological presuppositions.

THE NATURE OF THE DESTRUCTION

What was destroyed?

In seeking to identify the Flood in the geological record it is first necessary to consider how much of the earth was destroyed. In Genesis 6:13 God tells Noah that he will destroy all flesh 'together with the earth', because the earth is polluted with the corruption of every creature living on it. Likewise, when the destruction is over, he covenants with Noah (9:11) that a flood should never again rise to destroy all flesh, nor destroy the earth. But is the 'earth' here just the surface, the earth down to a certain thickness, or the whole earth?

In 1:10 'earth' is defined as the dry land. The contrast is with the gathered 'seas', their whole depth rather than their surface, and as we shall see later, in consequence of being gathered these seas lay beneath as well as around the land. The whole earth, therefore, is signified – that is, not the planet, but the whole crust. Other scriptures speak of the 'foundations' of the earth, by analogy with the foundations of a building. "Thou didst set the earth on its foundations, so that it should never be shaken," says the psalmist. Moses speaks of the foundations – we would say, roots – of the mountains, in the depths of

Sheol (Deut 32:22), a place where there is much water (Job 26:5, Ps 88:6, Jonah 2:2). Such phrases imply a dry land of considerable thickness.

It may be inferred, then, that the Flood destroyed the earth's crust in its entirety. So far as the land was concerned, the Flood was not only universal in its extent but total in its destructiveness. The high mountains of the pre-Flood land were broken down, not merely covered. If this exegesis is correct, we shall find no buried, undestroyed remains of the previous earth, such as coastlines, valley and mountain topography, roads and buildings, no geological boundary representing the surface of the old, covered by sediments of the new. The earth which then existed exists no longer (II Pet 3:6f). The present earth may be new in the same sense as Surtsey island, formed in 1963, is new, with the pre-Flood/Flood boundary lying, as Hunter has suggested [7], in the mantle beneath the crust.

The geological implications are, of course, far-reaching. On this reading there are no 'Creation Week' rocks as such, just as (because none of it is older than Jurassic) there is no 'Creation Week' ocean floor. The philosophical problems of interpreting pre-Vendian stromatolites in relation to Days Two and Three of Creation, as well as of interpreting inorganic structures which seem also to reflect more process than could have naturally occurred in that time, are nullified. Likewise, there would be no rocks which might have formed in the centuries immediately after the Creation. The basic question becomes, rather, to what extent, if not totally, pre-Vendian rocks are attributable to the post-destruction phase of the Flood.

The absoluteness of the destruction

Noah is commanded to board the ark, taking with him his household and examples of every beast and bird, because "in seven days I will send rain upon the earth... and every living thing that I have made I will blot out from the face of the ground." (7:4) A little later we read: 'All flesh died that moved upon the earth, ... everything on the dry land in whose nostrils was the breath of life died. He blotted out every living thing that was on the face of the ground, man, and animals, and creeping things, and flying things of the air; they were blotted out from the earth.' (7:21-23)

The verb translated 'blot out' in Genesis 6:7, 7:4 and 7:23 (RSV) is *machah*. It means 'wipe' or 'wipe out', as in II Kings 21:13, where God says that He will wipe Jerusalem as one wipes a dish: wipes it and then, to show that all trace of food has been removed, turns it upside down. As this simile shows, the Hebrew verb is the precise equivalent of 'wipe', just as English also has the equivalent metaphorical extension, to 'wipe out', meaning to obliterate, to make a population or family line extinct (cf. Prov 31:3, where the same word is used, and I Kings 14:10). The word is also used of erasing names from records (Ex 32:32f). Wenham comments: 'Since water was sometimes used for achieving this result (Num 5:23), the very word chosen perhaps hints at how the complete annihilation of mankind will be secured.' [24]

The totality of the destruction wrought by the Flood is further stressed by the additional phrases 'from the face of the ground' and 'from the earth'. No trace of any terrestrial animal remained. In the same way as the text reiterates that 'all flesh under the whole heaven' was destroyed, signifying that the Flood was a universal judgement in which not a single man escaped, so these phrases suggest that animal life was totally expunged from the earth.

If the entire crust of the pre-Flood earth was destroyed, so, inevitably, was everything that lived on it. The destruction was so violent that even insects and birds could not escape. Whatever visited the earth's crust when the fountains of the deep broke open made survival just as impossible for creatures that flew in the face of the firmament as it did for creatures that crept on the ground.

The earth was destroyed and every animal moving on the face of the ground totally obliterated. It follows therefore that no traces of pre-Flood terrestrial life remain even in fossil form. The earth which encloses the fossils is a new earth. All fossils of terrestrial creatures must be those of animals which repopulated the earth after the Flood. This much is also implied by the human fossil record. The earliest well-attested artefacts and fossils go no further back than the Pliocene, i.e. the early stages of the Ice Age [21].

Creationists commonly assume that fossils are diagnostic of the Genesis Flood. In order to be fossilised, it is argued, an animal needs to be buried quickly, and the most common agent of burial is sediment-laden water; consequently fossils imply catastrophic conditions. But this is not necessarily true. The vast majority of fossils are those of marine invertebrates, most of which are organisms protected within shells, and many of these are highly fragmented. Such shells could be buried at a rate of a few centimetres a year and still end up as fossils. Some of the most delicate and finely preserved examples of fossilised invertebrates – such as the exquisite dragonflies and crayfish from Solnhofen – suggest quiet-water,

possibly anoxic conditions, for which 'catastrophic' is not at all an appropriate description. There is neither biblical nor logical necessity for associating fossils directly with the Flood.

The fountains of the great deep

'In the second month, on the seventeenth day of the month, that same day all the fountains of the great deep broke forth, and the windows of the heavens were opened, and rain fell upon the earth forty days and forty nights.' Thus the Flood began.

It is sometimes assumed that these fountains, or springs, were hydrothermal vents, similar to those which occur in the middle of modern oceans where crustal plates are moving apart and new sea-floor is being generated [2]. Such vents are known from quite early in the geological record, the earliest being dated to the Silurian [12]. As with modern vents, but unlike nearly all the documented thousand or so ancient ones, the Silurian example was colonised by a diverse community of tube-worms. Conditions at that time and in that area were not, therefore, particularly cataclysmic. Much the same may be inferred of the other ancient vents. We know of them because they are preserved largely intact. If they were fountains of the deep, they were certainly not 'erupted' ones.

Without the adjective 'great' the deep is first mentioned in Genesis 1:2, where the earth was featureless and covered by water. The 'deep' was the water which enveloped the earth. On the third day of Creation the land was separated from these waters, and the waters were gathered together, presumably from further within the interior, and called 'seas'. The earth was founded upon these 'seas' (Ps 24:2). In this collective sense, 'seas' and deep are essentially synonymous [20]. The waters of the deep not only surrounded the land but underlay it, conceived as a single continuous mass on which, supported by 'foundations', the land rested. This concept is not at odds with geological knowledge (or inference). According to a recent report, more than 400 kilometres inside the present earth there may be enough water inside the crystal lattices of rare minerals to replace the oceans more than ten times [3]. Much of the water expelled from volcanoes appears to be of primeval origin [25].

The original surface of the earth was watered by springs [24], or moisture, coming up through the ground (Gen 2:5-6). The implication, reinforced by the rainbow after the Flood, which was clearly a new phenomenon, is that rain did not fall on the pre-Flood world. Plants received water for their growth from the 'deeps', the *tehemot* of Proverbs 3:20 and Deuteronomy 8:7, and these fed the river which flowed out of Eden.

The metaphor in Ezekiel 31, likening the king of Egypt to a tall cedar in Eden, gives us much the same picture: the roots of the tree were nourished by the rivers of the great deep under the earth. So in Isaiah 44 God is described as one who says to the deep, "Be dry, I will dry up your rivers" – the deep being the source of the rivers. Thus, while 'the deep' sometimes refers to the seas surrounding the earth (e.g. Job 38:30, Jonah 2:3), the passages in which the term refers to water within or under the earth are numerous (also Gen 49:25, Deut 33:13, Ps 78:15). The earth's whole water system was 'the deep'.

What, then, were the fountains of the deep? According to Proverbs 8:28, they existed from before the Flood as part of the original creation. They were not effects of abnormal eruptions.

When he established the heavens I was there,
when he drew a circle on the face of the deep,
when he made firm the skies above,
when he established the fountains of the deep.

The 'circle' would seem to be the land encircled by seas [20], and in accordance with the normal parallelism of Hebrew poetry the fountains of the deep stand in apposition to it, in the same way as 'heavens' stand in apposition to 'skies'. They are paired together because of their similar meanings. The fountains were established in the act of establishing the dry land: an essential part of the created world, on a par with the heavens; it is difficult to imagine the same significance being accorded to springs under the seas, which were not even visible to man. Revelation speaks in the same way: 'Worship him who made the heaven and the earth and sea and fountains of waters,' using the same Greek word for fountain, *pege*, as the Septuagint uses to translate the word in Genesis. In Revelation 8:10 the word is used explicitly of terrestrial springs.

Psalms 24:2 and 136:6 were the texts which led the earliest Flood geologists (notably Thomas Burnet and John Woodward) to understand the fountains of the deep as terrestrial springs [27]. Psalm 24 opens:

The earth is the Lord's and the fullness thereof,
the world and those that dwell therein;
for he has founded it upon the seas,
and established it upon the floods.

Psalm 136:6, likewise, says that the earth was spread out upon the waters. If 'the deep' was water under the earth, the fountains of the deep may have functioned as pressure valves by which water was released to the surface to irrigate the land.

For these reasons it seems best to conclude that the earth was flooded through the outbreak of subterranean waters, rather than through a marine transgression. Hasel, having studied the terms 'deep' (*tehom*) and 'burst forth', came to the same conclusion [5], as have most other Hebrew scholars (e.g. 11, 20, 24). Whitcomb and Morris quote Delitzsch to this effect [25]. The Flood did not come upon the land progressively, moving inwards from the coasts and upwards from the valleys, but everywhere at the same time. Nor did it merely cover the land; it burst through it. There was no possibility of men and animals at higher elevations escaping to the mountains. The land was broken up, almost instantaneously submerged, and as the initial violence subsided, replaced by new land.

Thus, to summarise this part of the paper, three conclusions may be drawn which are mutually supportive. First: the earth or 'dry land' was destroyed. Second: all life upon the earth was obliterated. And third: the fountains of the deep were subterranean springs, whose eruption caused the earth to be destroyed and all life upon it to be obliterated.

THE CHRONOLOGY

The word translated 'Flood' is *mabbul*, used thirteen times in the Hebrew Bible, and with the possible exception of Psalm 29:10, used exclusively in relation to the Flood described in Genesis 7. The unique word denotes a unique event. When an author wished to refer to floods within the compass of recurrent experience, he used other words, such as *nachal* (Job 28:4, Ps 74:15, Jer 47:2) and *yeh-ore* (Jer 46:7f, Amos 8:8, 9:5).

This much is fairly well known. However, the use of the term is even more exclusive than this, since in its strict sense the Flood ended long before the waters around Noah dissipated. Genesis 7:17 states: 'The *mabbul* was forty days upon the earth.' In other words, the Flood ended when there ceased to be constant rain, not when Noah left the ark. (As suggested by Austin *et al.* [2], this constant rain may have resulted from the condensing of steam ejected into the atmosphere.) It is in this period that the inundation took place, that all the high mountains under the whole heaven were covered, and that all flesh was destroyed.

Everything that followed the first 40 days was in the nature of an after-effect: the persistence of the waters, their flowing and ebbing, and the geological events accompanying those movements. Accordingly, in that part of the geological record which is attributed to the Flood the most destructive phase should appear at the beginning.

It has been suggested that the statement, 'The Flood was forty days upon the earth, and the waters increased and bore up the ark, and it was raised above the earth,' could mean that the *mabbul* was 40 days coming upon the earth before the ark floated [15]. The validity of this alternative depends, in part, on whether one accepts that 40 days was the total duration of the *mabbul*. If one does, then of course it is illogical to suppose that the ark began to float just as the Flood came to an end. If one does not, then the interpretation may seem possible – provided that one takes the verse in isolation.

The twelve occurrences of the word *mabbul* in Genesis may be analysed as follows:

Warning of the Flood
6:17

The Flood described
7:6, 7, 10, 17

Retrospect
9:11 (twice), 28; 10:1, 32; 11:10.

After verse 7:17, stating that the Flood was upon the earth 40 days, the term is not used again until 9:11, when the narrative looks back, and it is not used at all in describing events after the fortieth day; instead the author chooses the term 'waters': the waters prevailed, were assuaged, decreased, were abated, were dried up. If we think of *mabbul* as being simply a flood, this point may not seem significant, since in English 'waters' and 'flood' can be very close in meaning. However, because of its uniqueness, the Hebrew term has a different resonance. If instead we translate it with the equivalent of the Greek term – the Greek of the Septuagint and of references in the New Testament – namely, with 'cataclysm', we may be in a better position to see that 'waters' is not synonymous. 'Cataclysm' connotes a sudden and violent outbreak of waters. In these respects the omission of the word *mabbul* from the rest of the narrative supports the view that by Day 40 the Cataclysm was largely spent. The continual rain, which was the most perceptible expression of the *mabbul* (7:4, 12), had ceased.

Several authors have argued that the Flood narrative is structured as an elaborate palinstraphe, where corresponding verses fan backward and forward from the hinge-phrase, 'But God remembered Noah' [1, 8, 16, 20, 22]. Emerton, however, has adequately exposed the somewhat arbitrary nature of these schemes [4]. Among his criticisms are: (a) there is no symmetry in the length of the paired units, which varies from half a verse to several verses; (b) the schemes are selective, omitting phrases and sentences which are at least as significant as those which are included; and (c) some of the pairings are forced. That some of the symmetry is, in any case, intrinsic to the events being described would be granted by all. The question is to what extent, and to what positive effect, it has been deliberately enhanced.

The search for compositional structure has been driven by difficulties in understanding the narrative's chronology. However, the recondite structures proposed are unapt for eliciting meaning that must have been intended to communicate itself, if at all, at the surface level, to the consciously apprehending mind of the ordinary reader. In narrative the basic unit is the paragraph, and that is also, I suggest, the case here. Each paragraph begins, naturally enough, with a statement outlining the chronology of what is to follow.

Paragraph A

7:11-7:16. The first day of the Flood, introduced by the date and the statement that all the fountains of the deep burst forth and the windows of the heavens were opened.

Paragraph B

7:17-7:23. The Cataclysm itself, introduced by the forward-looking statement that the Cataclysm lasted forty days.

Paragraph C

7:24-8:4. The turning point, when the waters began to abate, introduced by the forward-looking statement that the waters prevailed upon the earth a hundred and fifty days.

Paragraph D

8:5-8:12. The emergence of dry land, introduced by the forward-looking statement, 'And the waters decreased continually until the tenth month; in the tenth month, on the first day of the month, the tops of the mountains were seen.'

Paragraph E

8:13 A statement that the waters had now disappeared from the land round about.

Paragraph F

8:14-19. The last day in the ark, introduced by the date and by the statement that on that day the earth was dry.

The same kind of structure informs the summary of the reigns of Judah's and Israel's kings in I Kings 15-16 and elsewhere. Within each paragraph, all the events described occur within the period mentioned at

the beginning of the paragraph. Accordingly, when Genesis says, 'The Flood was forty days upon the earth, and the waters increased and bore up the ark, and it was raised above the earth,' it does not mean that 40 days had passed before the ark floated. Rather, the increasing of the waters, the overwhelming of the land, and the destruction of every living creature took place all within the first 40 days.

Similarly, the often perceived discrepancy between the rain falling continuously for the first 40 days in 7:12 and the restraining of the rain in 8:2, after the mention of 150 days, disappears. It now becomes clear that the slackening off was simply one of the things that occurred within, not after, those 150 days. Along with the rain, the flowing waters, too, were abating long before Day 150. To say that they prevailed is not to say that they maintained a constant level. The prevailing began with the waters rising (7:17), and, as stated in verse 8:3, during this period the waters were subsiding – flowing and ebbing from the earth continually. Thus, on Day 151 the ark ran aground, the depth of the water relative to the land having fallen below 15 cubits.

Again, identifying the beginning of the next paragraph at 8:5 makes it possible to understand the otherwise rather puzzling 40 days of the next verse as immediately following the 150 days; it falls in the period of continuing abatement which is next punctuated by the appearance of the mountain tops. The chronology becomes:

Day 151	The ark runs aground.
Day 191	A raven is sent forth and does not return.
Day 198	(Inferred from 8:10) A dove is sent forth.
Day 205	The dove is sent forth again.
Day 212	The dove is sent forth a third time.

If we assume months of 30 days, the first day of the tenth month, when the mountain tops appear, corresponds to Day 224. That is, the mountains appear after Noah has thrice sent forth the dove to see whether there exists any place for the sole of her foot. Not until Day 315, three months later, is all the land in the area above water. By contrast, if the mountain tops were visible already before Noah opened the window of the ark and sent forth the birds, there would have been no question for the birds to answer.

AN EYE-WITNESS ACCOUNT

When Genesis says that all the high mountains under the whole heaven were covered, it is legitimate to ask whether 'all' means absolutely all or has the restricted sense of just all in the country where Noah lived. In this case, as has been argued by a number of scholars, most recently Kruger [10], 'all' decidedly has an absolute sense, in contrast, for example, to its use in Genesis 41:57 ('all countries came into Egypt ... to buy grain'). One comes to that conclusion by various lines of reasoning from the context.

Such reasoning will not always lead in that direction, however. Take a less obvious example: 'The waters prevailed above the mountains, covering them fifteen cubits deep.' (7:20) What does this verse say about the height the waters had attained? Since there were mountains before the Flood, one is tempted to suppose that sea-level must have risen thousands of metres. If one took an even more literal view, one might suppose that all the mountains of the pre-Flood earth must have been of the same height and that the Flood waters covered them all by exactly fifteen cubits. Most readers, I think, will reject such interpretations – even those who believe that the early chapters of Genesis should be understood 'literally' and 'at face value'. But the ground of rejection will not be one of context, for the biblical context says almost nothing by way of modification.

Here the key principle of exegesis is that the historical books of the Bible should be recognised, with the obvious exception of Genesis 1, as rooted in human eye-witness reports. This is true of the books describing the life, works and words of Jesus Christ; it is true of the account of the Flood [26]. As we interpret, we have to consider how things appeared to those who observed, or participated in, the things being recounted. In Isaiah we are told that before the great day of the Lord, every valley will be lifted up and every mountain will be made low. Suppose that such events happened in the Cataclysm: would they be incompatible with the statement that the waters prevailed above the mountains? I think not. The point is not that the mountains survived the Flood as mountains (it is more likely, in view of Gen 9:11, that they were destroyed), but simply that even the highest land was inundated. Likewise, the detail about the mountains being covered fifteen cubits deep probably stems from an observation that this was the draught of the ark when fully laden and hence the minimum depth to which the land was inundated [11].

To interpret in this way is to take the view that such statements constitute the inferences of those who lived through the events being described.

The same approach applies to the interpretation of 'earth'. In the Hebrew the word is *erefs*, and like 'all' it may have either an absolute sense – the dry land everywhere – or the limited one of a country or region. In the early part of the narrative the context makes it clear that the dry land everywhere is signified. We infer this in much the same way, probably, as Noah himself inferred it, observing that all the mountains were under water and that every living thing upon the earth had perished.

Similarly, the return of the dove enabled him to infer that 'the waters were still on the face of the whole earth', for if water still covered all the Ararat region, it was also likely to cover the more low-lying regions further off (even here the 'whole earth' does not necessarily mean every part of every continent). By contrast, when the dove was sent forth a third time and failed to return, he could affirm only that the land was dry somewhere in his vicinity. A little later, 'Noah ... looked, and *behold*, the face of the ground was dry.' (8:13) The narrative – albeit in an 'edited' form of much later composition – invites us explicitly to see things from his perspective. The 'whole earth' is not mentioned.

We cannot be certain that the ark landed on the very first mountain to emerge above the waters. When the text says 'the waters were dried from off the earth', it means that the waters had drained from the Ararat region – what Noah could affirm from his own knowledge – rather than that the earth everywhere had become dry. Varying degrees of uplift, subsidence and dislocation in different parts of the new earth will have resulted in varying rates of emergence, and there was every reason for the ark to land providentially in one of the first regions to become dry. Noah's disembarkation was a geological event only inasmuch as it must mark an unconformity in the Ararat region (if not the surface itself). It is unlikely to correspond with the lowest point in any global sea-level curve.

THE MOUNTAINS OF ARARAT

In the period of migration spanned by the genealogy of nations in Genesis 10 the places listed seem to have been named after the patriarchs who fathered the peoples who first settled in them. For example, the inhabitants of the land Cush (= Sudan) were people descended from the man Cush; similarly with Mizraim (= Egypt), Put (= Libya), and Canaan (= Palestine). But place-names can change, especially if the eponyms move to another region, as tribes frequently did in the first millennia after the Flood (cf. Amos 9:7). Genesis itself records numerous changes of name (14:2, 3, 7, 17; 23:2, 19; 35:19).

The possibility that Ararat too was the name of an early patriarch must be borne in mind when considering the location of the Ararat mountains. If the Flood narrative was composed within a few centuries of the event, these mountains may have been quite a different place from that known as the 'land of Ararat' in, say, Jeremiah's day. Jeremiah 51:27 mentions Ararat alongside the nations Minni and Ashkenaz. Although the identity of Minni is unknown, Ashkenaz was one of the pre-Babel descendants of Japheth (Gen 10:3) and may have given his name to the Scythians, nomadic tribes who in classical times lived north of the Black Sea. Ararat, or Urartu as it was known to the Assyrians, was then roughly equivalent to present-day Armenia. In view of the movements of people through Armenia and neighbouring countries as late as the first millennium BC, it is highly improbable that the same tribe would have been living there from the very beginning of human habitation.

The present Mount Ararat is an extinct volcano more than five kilometres high and dates from the Pleistocene, or Ice Age. The other mountains in the area, also volcanic, date from no earlier than the Oligocene. All of them are the result of Arabia's (and indirectly Africa's) collision with the continental plate of Asia during the Tertiary. Needless to say, a volcano is not the most likely of landing-places, and it is scarcely satisfactory to postulate that God intervened to mitigate the misfortune of landing among lava and ashes [6]. On purely geological grounds, traditions which associate 'the mountains of Ararat' with this part of the world must be treated with caution.

They should also be treated with caution in the light of the fact that the area between lakes Van and Urmia, occupied by the kingdom of Ararat/Urartu from at least the 10th century BC, contains a number of pre-Flood names, such as Eden, Nod, possibly Gihon (the river Araxes) and Pishon (the river Uizhun) – not to mention the Tigris and Euphrates further south [17]. These topographical names were resurrected after the Flood, one surmises, out of a desire to establish continuity with the world that had perished. (A parallel might be drawn with place-names such as Manchester, Cambridge, New Hampshire and so on in the 'New World' of North America.) As pointed out by Munday [14], Eden is specifically mentioned as a

land somewhere in the post-Flood Near East in II Kings 19:12 and Ezekiel 27:23. Havilah, Cush and Assyria (now surrounding rather than east of the Tigris) complete the list of correspondences. If the identifications of Gihon and Pishon are accepted, all the place names in Genesis 2 had counterparts in the post-Flood world.

The association between Armenia and 'the mountains of Ararat' may therefore be of a piece with these transpositions. If Ham's 'sons' Cush and Havilah got their names from pre-Flood lands (themselves named, perhaps, from pre-Flood patriarchs – cf. Gen 4:17), so might also a descendant named 'Ararat': he could then have given his name to the place Urartu in the same way as Cush and Havilah gave theirs to the lands which they inhabited. The original names would have come down through the same oral tradition from which the Genesis account itself was ultimately derived. At the same time, in those lands, their restoration as place names would have hastened on the corruption of that tradition, as the reclaimed Eden of Nimrod's successors became assimilated to the true Eden and negated the idea that the old earth had been destroyed. In order to legitimise their rule, the early kings of Assyria claimed descent from pre-Flood kings. Thus the oldest known tradition of the Flood outside Genesis – the Epic of Gilgamesh – was already heavily paganised, and had the ark landing on a Mount Nisir, thought to be located east (not north) of the Tigris. Other traditions claimed it landed in other places in the Near East [27]. The belief that the ark landed among the mountains of Armenia, for which the most ancient authority is a Marduk-worshipping priest of the 3rd century BC [13], is not likely to have come from a purer source than the Epic of Gilgamesh.

Wherever they were located, if the 'mountains of Ararat' were among the first to be uplifted, one should be looking to place Day 150 in the Proterozoic, since that is when, geologically, mountain-building first occurred. Later, of course, the region could have been subjected to further deformation, including massive erosion. The Bible does not record what happened to the landing site after Noah disembarked, other than to imply that the region was first populated by descendants of Ararat.

Genesis also says nothing about the extent of geological activity anywhere else after the ark's occupants were released. The first day of the first month was the day which marked the disappearance of the waters from where Noah was, not the end of the Flood in any global sense. The narrator is concerned to describe the Cataclysm in its character as a universal judgement, which ended when God made a wind to blow over the earth and the fountains of the deep were stopped. The Flood in the wider sense of the Cataclysm plus the receding of the waters and drying off of the new earth might have ended, globally, much later than the day when Noah disembarked. Indeed, an end in this absolute sense is undefinable, given that the boundaries of the new earth could not have been identical with those of the old. Thus, one should be cautious about linking the closing stages of the Genesis Flood to any global sea-level curve. Orogenesis, isostatic rebound, and the elevation of newly generated seafloors – phenomena which we know from the geological record – must have caused some parts to rise above the sea, others to sink beneath it, and some to oscillate between both conditions. The very lowest sea-levels were not attained until the Ice Age, at which time one could walk from Thailand to Borneo, and from Siberia to Alaska.

CONCLUSIONS

Any theory of the earth which recognises that there was once a global deluge must pay due regard to the historical account of that deluge in Genesis. Although that record counts as one of the 'showpieces' [9] of the documentary hypothesis – namely, of the idea that Genesis derives from documentary sources of late authorship, different from and sometimes conflicting with each other – the present study suggests that the discrepancies alleged as the chief evidence of the hypothesis [4] do not exist. That is, there is no confusion as to whether the Flood lasted 40 or approximately 370 days, nor about when there ceased to be constant rain, nor about when, in relation to the sending forth of the raven and the dove, dry land appeared. Several features indicate that the original source of the account was the recollection of an eye-witness. On objective grounds, the historical value of Genesis 7-8 would therefore appear to be high. It serves both as the basis of diluvialist theory and as a constraint upon it.

Of particular relevance to geological models, Genesis indicates that the Flood proper – the *mabbul*, or Cataclysm – lasted 40 days, and began with the eruption of subterranean waters. During these 40 days the earth's landmass was totally destroyed and all life upon it blotted out. On both counts, pre-Flood terrestrial life is unlikely to have been fossilised. All subsequent geological phenomena, until the waters were dried from off the earth and even (arguably) up to the present day, were after-effects of the Cataclysm. By Day 191 the wind which blew over the waters had died down sufficiently for a raven from the ark to survive the remainder of the Flood (in the extended sense). Whether the new land on which

the ark came aground was the very first to emerge is not stated, but the text implies that in general the waters were abating some while before Day 150. In places the waters may have persisted long after they had disappeared from the region which later became known as the mountains of Ararat. The location of those mountains is no longer known, but it is unlikely to be anywhere near the present Mount Ararat.

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