The Bible and geology: destruction of Sodom and Gomorrah

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Abstract: The biblical story of the destruction of Sodom and Gomorrah is interpeted as a reflection of a real natural disaster. According to the Bible, Sodom and Gomorrah were situated near the southern part of the Dead Sea basin or in the Jordan River valley. The description of their destruction in the Bible can be interpreted only as volcanic eruption. Evidence of middle Holocene volcanism is absent both in the Dead Sea and Jordan River regions, but has been found in the Neogene–Quaternary lava highland in the southern Syria. At two settlements, Khirbet El-Umbashi and Hebariye, dated around the second part of the third millennium BC, many animal bones were covered by the basaltic lava. It is possible that, the Bible's story of the destruction of Sodom and Gomorrah combined collective memories about two events. Located in the Dead Sea region, Sodom and Gomorrah were most probably destroyed by a strong earthquake or flood, but the fresh memory about two settlements perishing from a volcanic eruption caused the population to merge these two events.

Three components can be distinguished in the Bible. The first is the basic spiritual and religious element of the tale which is not discussed here. The second is a statement of ancient history about the Jewish people that can be verified partly by other historical documents. The third component is that of myths and legends of Semitic and other tribes that were created before separation of the Jews within the Semitic family. These myths and legends may be a reflection of real natural and historical events that were subsequently passed on orally from one generation to another, and in a didactic sense, attributed to the events in the Bible. The most important details for reconstruction of the sources of legends are those that are neutral to the didactic sense of the legend and that can be examined in their environmental and historical context. In the present paper, this approach to the Bible is illustrated by studying the story of the destruction of Sodom and Gomorrah. The tale is well known and is therefore not given in full here. Instead, attention is drawn to some details suggestive of the source and sense of the legends.

The legend is a part of Genesis, the first book of the Bible. Because 'the Lord said to Moses: Make a record of this in a book, so that it may be kept in memory' (Exodus 17:14), it is possible that the main concept of the new monotheistic religion attributed to Moses was fixed in the thirteenth century BC. However, according to Frazer (1923) and Keller (1980), the final version of Genesis was formed later by using two written sources known as Y-source and E-source. The Y-source gave God the name Yahweh (the Lord in English) and was created in Judah in the tenth or ninth century BC. The E-source named the God El or Eloah (pl. Elohim) and was created in about the eighth century BC in Israel. At around the same time, or slightly later, the sources were joined together. The sources differed in some details, and these differences remain in the combined text. It causes difficulties for an accurate interpretation of some Bible details, particularly for those related to location and a way of destruction of Sodom and Gomorrah. Bentor (1990) emphasizes another difficulty: 'The Bible makes frequent use of geological events, but ... it does not care much about dates and places, shifting geological events around to suit its purpose'.

Uncertainty in location of Sodom and Gomorrah

The Bible story of the destruction of Sodom and Gomorrah is as follows. Lot was a nephew of the rich cattle-breeder Abram, and they lived and worked together around the Dead Sea. Because of tension between their herdsmen, they separated and 'Lot took for himself all the valley of Jordan ..., moving his tent as far as Sodom' (Genesis 13:11–12). God decided to exterminate the sinful inhabitants of Sodom and Gomorrah, but to save pious Lot and his family. God's messengers had told them to leave the town; one of them said: 'Flee for your lives, without looking back or waiting in the lowland, go quickly to the mountains or you will come to destruction' (Genesis 19:17). The towns were destroyed. Lot's family left for Zoar, 'then went up out of Zoar to the mountains' (Genesis 19:30) and was saved, 'but Lot's wife, looking back, became a pillar of salt' (Genesis 19:26).

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The following fragments are important in locating Sodom and Gomorrah. 'Now in the days of Amraphel, king of Shinar, Arioch, king of Ellasar, Chedorlaomer, king of Elam, and Tidel, king of Goiim, they made war with Bera, king of Sodom, and with Birsha, king of Gomorrah, Shinab, king of Admah, and Shemober, king of Zeboiim, and the king of Bela (which is Zoar). All these came together in the valley of Siddim (which is the Salt Sea)' (Genesis 14:1–3). 'And the king of Sodom with the king of Gomorrah and the king of Admah and the king of Zeboiim and the King of Bela (that is Zoar), went out, and put their forces in position in the valley of Siddim' (Genesis 14:8). The 'Sodom–Gomorrah' coalition sustained a defeat. The conquerors 'took all the goods and food from Sodom and Gomorrah and went on their way' (Genesis 14:11). Because 'in addition they took Lot . . . , who was living in Sodom . . . , Abram . . . took a band of his trained men, three hundred and eighteen of them . . . , and went after them as far as Dan. And separating his forces by night, he overcame them, putting them to flight and going after them as far as Holah, which is on the north side of Damascus' (Genesis 14:12–15).

These quotations show that the conquests came from the nearby territory of Syria or Lebanon and Sodom and Gomorrah were situated southerly. The armies met 'in the valley of Siddim which is the Salt Sea' (the Dead Sea), and this suggests that the valley may have been situated in or near the recent shallow southern part of the Dead Sea which may have flooded later. It is reasonable to assume that Sodom and Gomorrah were situated not far from there. 'Salt pillars' in Mount Sodom, west of the site under discussion, as well as general salinity of the area support this idea. This idea was published by Bentor (1990) who argued it by interpretation of the old settlement in Tel es-Safi (south of the recent Dead Sea) as Zoar. But excavations have not found Early–Middle Bronze layers under the ruins of the Arabic (Middle Age) Zoar and the location of the Biblical towns in or near the southern part of the Dead Sea continues to be questionable.

At the same time, given that 'Lot took for himself all the valley of Jordan (during the division with Abram), and went to the east . . . to the lowland towns, moving his tent as far as Sodom', the latter could be situated in the eastern side of the Jordan valley, north of the Dead Sea. Such a location is supported by the other fragment of the Bible text: 'And Abram . . . went to the place where he had been talking with the Lord and looking in the direction of Sodom and Gomorrah and the lowland . . .' (Genesis 19:27–28). That place was identified in Samaria as lying to the west of the Jordan valley, closer to the Mount Garizim (Keller 1980).

Both locations mentioned above may be in doubt if the way God had chosen for destruction of Sodom and Gomorrah is taken into account. 'Then the Lord sent fire and flaming smoke raining down from heavens on Sodom and Gomorrah. And he sent destruction on those towns, with all the lowland and all the people of those towns and every green thing in the land' (Genesis 19:24–25). 'And looking in the direction of Sodom and Gomorrah and the lowland, he (Abram) saw the smoke of the land going up like the smoke of an oven' (Genesis 19:28). The Bible also says that the neighbouring Zoar (several hours' walk from Sodom) was not affected. Fire, smoke of the land and destruction of 'all the lowland . . . and every green thing in the land' and, at the same time, absence of destruction in Zoar all suggest a volcanic eruption as the most probable cause of the described disaster. It is unlikely to have happened near the Dead Sea or in the Jordan River valley, since signs of eruption as young as the one supposed have been found only in the southwestern Syria and an adjacent part of Jordan.

Middle Holocene volcanism in southwestern Syria

To the south and to the SE of Damascus, the Jebel Arab highland with Neogene–Quaternary basaltic lavas stretches for a distance of 450 km (Ponikarov 1964; Ponikarov *et al*. 1967; Rukieh *et al*. 2005) (Figs 1 & 2). Its altitudes are usually more than 600 m and the tops of some volcanoes are as high as 1200–1800 m. In this area, individual centres of volcanism form northwest trending chains and mark extensional fault zones, which branch from the active sinistral strike-slip Levant Fault (the Dead Sea Transform). The basaltic flow of Kra looks the most recent and has been dated as Holocene (Ponikarov 1964). The basalt was erupted from a small volcano on the NW-trending active fault on the NE slope of the Druze Mountains near the present village of Rdemet Ash-Shakhur (about 80 km SE of Damascus and 100 km to the east of the Sea of Galilee). The eruption began from two adjacent centres located on the fault, several hundred metres from each other and later concentrated in a single volcano (the height of which was about 1050 msl). The lava flow spread 32 km to the NE of the Druze Mountains along two wide dry valleys (wadis), Ar-Rampliyat in the south and Kra in the north (Fig. 3). Distal parts of the lava flow covered the remains of two settlements, burying mass accumulation of bones, Khirbet El-Umbashi on the northern side of the flow and Hebariye 7 km to the south. Their altitudes are about 670 m. The lava flow is 4–5 m thick

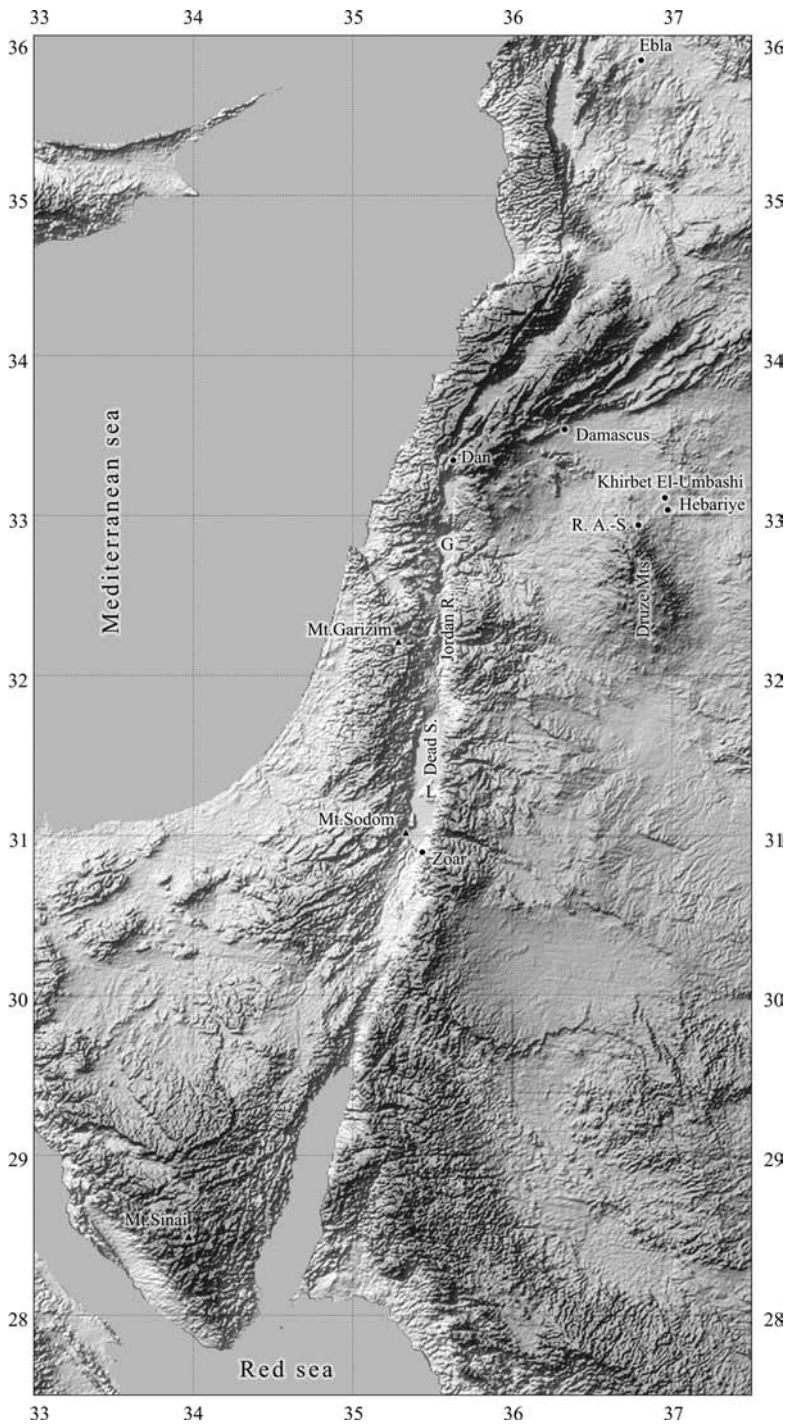

Fig. 1. Near East: a topography and location of the mentioned sites. G, the Sea of Galilee; L, the Lisan peninsula; R. A-S, the village of Rdemet Ash-Shukhur; Zoar, the Middle Age town.

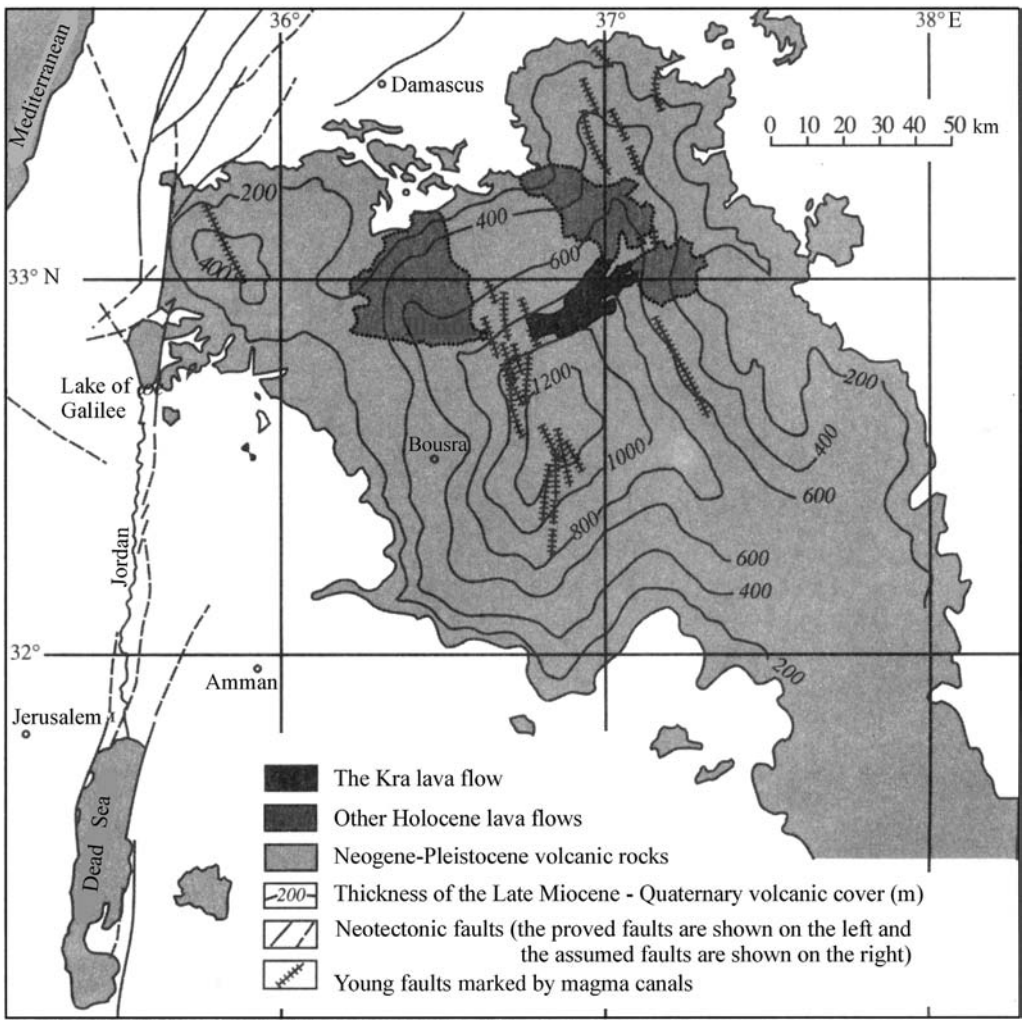

Fig. 2. Active faults and manifestations of the Neogene–Quaternary and Holocene volcanism in the southwestern Syria and adjacent part of Jordan (Trifonov & Karakhanian 2004).

and the surface is formed by *a-a* type basaltic boulders.

These sites with bones were discovered by Cyril C. Graham in 1857. Later, J. C. Wetzstein, Consul of Prussia, described the sites according to the story of a local Sheikh. The detailed studies were carried out by Dubertret & Dunand (1954–1955). The author visited the area first in 1986 together with the Syrian geologists F. F. Al Baqqa, H. Al Maleh, Yu. El Khair and T. Zaza (Trifonov & El Khair 1988; Trifonov & Karakhanian 2004).

In Khirbet El-Umbashi, the bones are concentrated, along with other settlement remains, in the upper cultural horizon of the layer. This layer is up to 2.5 m thick with pebbles and gravel in the carbonate loam matrix occuring on the uneven surface of the Late Pleistocene lava (Fig. 4). The layer forms a lower terrace of the wadi and is horizontally stratified. Its pebbles and gravel represent local basaltic material and are not rounded; they are mountain alluvium from a temporary stream. Its carbonatization (the strongest in the upper surface) has been caused by climatic influence and is typical of the Quaternary alluvium terraces in Syria. The carbonate matrix contains small fresh pyroxene crystals which were produced by the youngest eruptions of the Khaldieh Late Pleistocene basaltic stratovolcano situated 31 km westward. So, the layer may be have not only fluvial, but have a more complex origin.

Fig. 3. Space ERTS imagery of the Kra lava flow region in the southwestern Syria (Space Image Atlas of Syria 1996). U, Khirbet El-Umbashi; H, Hebariye; R, Rdemet Ash-Shukhur.

The cultural horizon with bones is usually several tens of centimetres thick. Thickness increases near the ruins of some buildings up to 1.2 m. The primitive buildings were covered by the Kra lavas and therefore predate the eruption. More complex buildings were constructed after the eruption, on top of the lavas. Within the horizon, many fragmented bones as well as fragments of flint tools, moulded ceramics and cone-shaped stones with drilled holes along axes (were probably tied with cords and used to catch cattle) were found. The ceramics were made with red clay and were well fired (Fig. 5). Rough vessels with admixed coarse sand predominated, but same fine, glossy pottery was also found. Some fragments were covered by a scored comb-like ornament or were coloured by crossing brown, white and black stripes. A fragment of a painted figure of bull or deer was also found.

The ruins, partly overlain by the lava on the southern side of the recent wadi Kra, represent the remains of rectangular constructions made with basaltic stones. Beside those, two other types of construction were found at a distance from the lava flow. Rare findings of ceramics support a synchronism between both types of ruins with ruined buildings near the lava flow. The first type is represented by several rounded pits of 2–2.5 m in diameter and up to 0.5 m deep, hollowed out basalt. Probably, they served as foundations for temporary homes. The second type is represented by numerous graves that look like little houses made with flat basaltic blocks and contain rectangular or oval pits inside. Some of them have several pits. We found fragments of skeletons there. Standardization of the graves and very poor implements are signs of a catastrophe, as was shown for the cemetery in the town of Trianda in the Rodos Island after the Great Minoan earthquake–eruption of the middle of the second millenium BC (Marketou 1990).

Discussing the bones, we differentiate 'kitchen-midden'—fragmented bones within the cultural

Fig. 4. Section of the Kra lava flow and its basement in Khirbet El-Umbashi. Rough surface of the Pleistocene lava is covered by horizontally stratified carbonate-terrigenous sediments and the latter are covered by the Kra lava flow. The bone fragments form thin lenses between the Kra lava and the sediments.

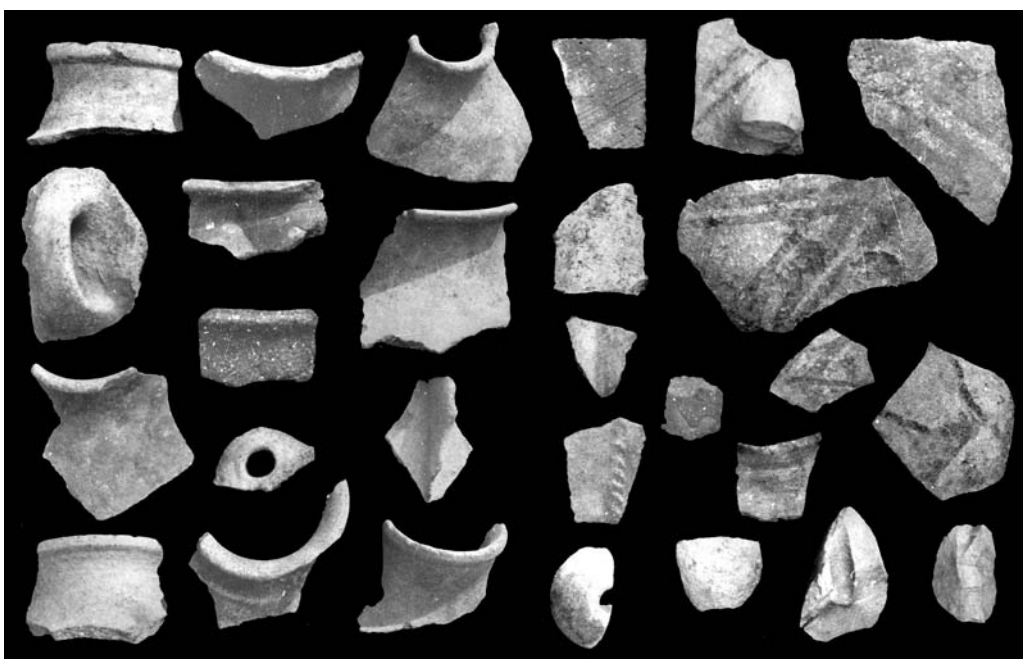

Fig. 5. Ceramics and other archaeological findings from Khirbet El-Umbashi (Trifonov & El Khair 1988).

horizon—and numerous bones at the top, although they probably belonged to identical animals. The 'top' bones cover a larger area. At minimum, they belonged to several tens of thousand of animals. According to the published data (Dubertret & Dunand 1954–1955) and data of our collection analysed by Dr E. M. Vangengeim, they are mostly the bones of domestic animals, such as bulls, goats, sheep and gazelles. They were similar to recent Syrian cattle, but slightly smaller. Single bones of *Bos primigenius* and camel as reported by Dubertret & Dunand, and probably of donkey or mule were also found in our collection. In contact with the basalts, the bones were soldered into the lava bottom (Fig. 6). Dubertret & Dunand (1954–1955) observed two different effects of the eruption on the bones. Those bones heated up to 600 °C were scorched, but kept their primary microstructure. Other bones that were heated more strongly were calcinated and partly converted into hydroxyapatite.

In Hebariye, the interaction of the bones and the Kra lavas is similar to that at Khirbet El-Umbashi, but the settlement and the area of bone accumulation is smaller. Besides the described buildings and bones, Dubertret & Dunand (1954–1955) reported younger rectangular and rarer oval constructions in both settlements. In Khirbet El-Umbashi, they were built with large basaltic blocks without cementation, were covered by basaltic slabs and had a single door and interior supporting column. Some of these were accompanied by a small yard fenced by a low stone wall having pens similar to those in the Syrian country-side. In Hebariye, similar constructions were built using bigger blocks and did not have the supporting columns. The inner height of the constructions in both settlements does not exceed 1.2 m. So, they could hardly have been built for living, although they were used later for temporary visits by nomads. They were probably built as sepulchres. Dubertret & Dunand attributed these 'megalithic' constructions to the Amorites whose Middle Bronze culture is dated now by 2100–1600 BC. Some are situated above the Kra basalts in Hebariye. So, the constructions were built later. The youngest archaeological generation is represented in Hebariye by the square building of the third–fourth centuries AD.

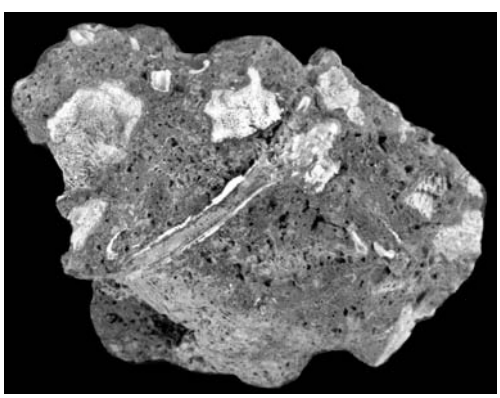

Fig. 6. Breccia of animal bones cemented by the Kra lava, Khirbet El-Umbashi.

Thus, two settlements existed on wadi banks of the Jebel Arab highland in pre-Amorites time. Cattle-breeding was an important occupation of the inhabitants. The existence of the settlements was interrupted by the Kra eruption. Just before their destruction many animals (both domestic and wild) were concentrated near the settlements; although they escaped the eruption, they still died. The lava could not kill them, because it moved slowly along the gentle wadis and hoofed animals like gazelles could easily run away. It is likely that they (as well as people?) perished from volcanic gases, and subsequent lava partially covered what remained by that time. According to the S. Thorarinsson (1969) data, the fluorine explosion during the similar Laki eruption of 1783 in Iceland killed half of the cattle and a significant proportion of inhabitants. We could not find any human remains among the bones and the former investigators had not reported this either. But the necropolis, with numerous standard burials from this period most probably served as the burial place for those who had not been covered with lava. After the eruption, the settlements became populated again.

The age of the Kra eruption is close to that of the settlements and bones and is older than the Middle Bronze 'megalithic' constructions. Dubertret & Dunand (1954–1955) dated the ceramics from the settlements by the Early Bronze epoch. Dr H. Saliby from the Damascus Archaeological Museum dated our collection (Fig. 5) by the last third of the third millennium BC.

The bones do not contain carbon. The ruins of rectangular construction partly overlain by lava in the southern side of the recent wadi Kra contain bones of domestic hoofed animals. Probably, the construction served as a stall. Its floor represents a mixture of the dug palaeosoil and the remains of cattle activity. The material was collected by W. L. Liere in 1954 and dated by H. Vries and G. W. Barendsen from the Groningen University (Dubertret 1963). They reported: '... part of the present material had obviously been charred with absence of oxygen. It was nearly black and it contained as much as 25% of carbon. The age was found to be 4075 $\pm$ 160 years' (calendar 2880–2460 BC). So, the ^{14}C date is several hundred years older than the archaeological one.

A similar relationship was observed within a soil in Armenia during trenching of the Bronze Age settlements in the Khanarasar active fault zone near recent village of Ghegadzor (Subatan) and in the Fioletovo segment of the Pambak–Sevan active fault zone. In Fioletovo, the dug palaeosoil from the floor of the archaeological object gave the ^{14}C date 5030 ± 170 years (calendar 3982–3647 BC) and contained ceramics of the twenty-sixth–twenty-second centuries BC (Philip *et al*. 2001; Trifonov & Karakhanian 2004). Alexandrovsky (1996) studied the problem in the example of the 'Trayan' man-made bank in Western Ukraine. Using detailed ^{14}C dating he showed that a soil formed over a long period and its age could differ by several hundred or even more than a thousand years in the surface horizon and at a depth of 10–20 cm, where the huminic acid accumulation and transformation was still continuing. Because the surface horizon could be destroyed during building and exploitation of the construction, its real age might be younger than the ^{14}C date of the preserved soil top. So, the last third of the 3rd millennium BC is probably the most reasonable age of the eruption under discussion in Syria.

Correlation between the legend of destruction of Sodom and Gomorrah and the eruption of Kra

The most likely explanations of the destruction of Sodom and Gomorrah as natural phenomena are the following four hypotheses: (1) environmental (climatic) change; (2) flooding; (3) strong earthquake; and (4) volcanic eruption.

(1) '... The valley of Jordan ... was well watered everythere, before the Lord had sent destruction on Sodom and Gomorrah; it was like the garden of the Lord, like the land of Egypt, on the way to Zoar' (Genesis 13:10). The catastrophe resulted in 'destruction on those towns, with all the lowland and all the people of those towns and every green thing in the land' (Genesis 19:25). Nissenbaum (1994) added the accompanying destruction of the towns environmental change to this. He compiled historical, archaeological, hydrological and palynological data on Palestine and Egypt and Sumer and showed that the devastation of Sodom and Gomorrah correlated with drought conditions causing famine, a decline of the population, desolation of urban settlements, collapse of burgeoning kingdoms and flourishing agricultural societies and their replacement by more primitive heminomadic cultures. The process was dated in the second half of the third millennium BC with a peak in the twenty-fourth–twenty-second centuries. We found synchronous environmental and historical changes not only in the Fertile Crescent, but also in the circum-Black Sea region, the Trans-Caucasus, and the southern Turkmenia (Trifonov & Karakhanian 2004). Environmental change occurred over a fairly long time (even in such climatically fragile semi-desert area as Palestine) and could not have been the direct source of the destruction of Sodom and Gomorrah. Understanding it, Nissenbaum (1994) considered probable 'that a major earthquake occurred during this period to provide a *coup de grace* to already collapsing society'.

(2) Strabo (first century AD) was possibly the first person who supposed that the destruction was caused by the Dead Sea waters bursting its bounds and flooding the towns. Bentor (1990) developed the hypothesis. He remarked on the very shallow depth of the sub-lacustrine swell in a continuation of the Lisan peninsula that joins the larger deep northern and smaller shallow southern parts of the Dead Sea. Very slight fluctuations of the lake level may have separated these parts and the southern one had to be dried because of a high evaporation. Bentor showed that such a situation had probably existed for some time. He proposed three mechanisms for the flood: the climatically-induced rise of the lake level, subsidence of the swell by salt solution, and a strong earthquake. The first mechanism is doubtful, because destruction of the towns happened during a drought, when the lake level could only decrease. And as Nissenbaum (1994) showed by using the Neev & Emery (1967) data, even at that time the southern basin of the Dead Sea existed and had been characterized by massive deposition of salt. If the basin became desiccated immediately prior to the destruction of the towns, the plain could not have been 'well watered everythere, ... like the garden of the Lord, like the land of Egypt'. This argument could hardly correspond to the second mechanism of flood. So, if it took place (although the flood was not combined with destruction of the towns by 'fire and flaming smoke'), its most probable source may have been a strong earthquake.

(3) The two previous hypotheses had to invoke a strong earthquake as a direct source of the destruction of Sodom and Gomorrah. This explanation of the destruction is now the

most popular. It is based on high seismicity and both historical and prehistorical strong earthquakes identified in and near the Dead Sea transform fault (Ben-Menahem 1991; Nur 1991). Although the earthquake may have happened there at or close to the time of a collapse of the towns, it is not commensurate with 'fire and flaming smoke' attributed to the event and 'destruction on those towns, with all the lowland and all the people of those towns and every green thing in the land'. The Bible also identifies earthquakes as a particular phenomena, telling 'about Israel in the days of Uzziah, king of Judah . . . , two years before the earth-shock' (Amos 1:1) or '. . . as you went in flight from the earth-shock in the days of Uzziah . . .' (Zechanah 14:5). Description of the destruction of Sodom and Gomorrah is different.

(4) Block (1975) located the destructed towns near the Dead Sea and suggested that the destruction may have been caused by a volcanic eruption with pyroclastics-tuffs and volcanic bombs. He considered that the ascending magma may have come into contact with oil deposits and caused the burning of petroleum. Such deposits may have existed in the area, because 'the valley of Siddim was full of holes of sticky earth' (Genesis 14:10) which Bentor (1990) interpreted as asphalt wells. The main objection to Block's hypothesis is the absence of manifestations of the Holocene and Late Pleistocene volcanism near the Dead Sea.

Bentor (1990) paid attention to the description of signs of a volcanic eruption in the Exodus. When the Jews continued to move towards Mount Sinai, 'the Lord went before them by day in a pillar of cloud . . . and by night in a pillar of fire . . .' (Exodus 13:21). Just before God descended on Mount Sinai, 'when morning came on the third day, there was thunder and flames and a thick cloud on the mountain and a horn sounding very loud. . .' (Exodus 19:16). 'And all the mountain of Sinai was smoking, for the Lord had come down on it in fire; and the smoke of it went up like the smoke of a great burning; and all the mountain was shaking' (Exodus 19:18). 'And all the people were watching the thunder and the flames and the sound of the horn and the mountain smoking' (Exodus 20:18). If we ignore the fact that the Exodus was several hundred and perhaps a thousand years after the destruction of Sodom and Gomorrah, no evidence of recent volcanism has been found in the Precambrian rocks of the Mount Sinai. According to Bentor's (1990) notion, this can be explained by peculiarities of the Bible which 'does not care much about dates and places, shifting geological events around to suit its purpose'. Discussing where the narrators of the legend could listen to volcanism, Bentor refers to the young volcanic manifestations in the Druze highland, that describes the Kra eruption. Could it be really a source of the legend about destruction of these towns?

Bentor (1990) argued that the flood origin of the destruction by the command of the God's messengers to Lot 'Flee for your lives, without . . . waiting in the lowland, go quickly to the mountain or you will come to destruction' (Genesis 19:17). But going to the mountain is a way to escape not only from the flood, but also the moving lava. The Bible division of pastures between Abram and Lot does not seem to contradict the location of Sodom and Gomorrah in the south of Syria and the suggested destruction by the lava flow from Kra, since 'Lot took for himself all the valley of Jordan . . . , moving his tent as far as Sodom'. Supporting evidence is contained in the texts of the third millennium BC found during the excavations of ancient town of Ebla (Tell Mardikh, 40 km to the SW of Aleppo, Syria), which mentions both Abram and the towns of Sodom and Gomorrah lost in fire. However, the translation of these texts has to be revised (Keller 1980). In the meantime, assuming that the lost cities were in southern Syria, we could hardly explain how Lot could reach Zoar in few hours (if it was situated in the Jordan River valley or near the Dead Sea), and how Abram could see what happened to the cities from the mountain that was situated on the western side of the Jordan River.

Particular difficulty for the volcanic as well as Nissenbaum's climatic interpretations of the destruction of Sodom and Gomorrah is that, according to the Bible tradition, Abram and Lot lived early in the second millennium BC, but the eruption and synchronous climatic changes occurred in the second half of the third millennium BC, most probably in the twenty-fourth–twenty-second centuries. The flood and earthquake interpretations do not involve the same difficulty, because they do not have the geological dating documentation. Attributing the event to the period of patriarchs, Nissenbaum (1994) estimated its age by comparing the Biblical text with the historical and archaeological data: 'The era of the patriarchs has been dated as late as the 19th or 18th century BC by scholars who found similarities between the social structure as described in texts from Mari, dating to the early second millennium and the Bible . . . Others have proposed that from an archaelogical point of view the second half of the third millennium BC, that is Early Bronze IV (2300–2000 BC), provides the best conditions for the movement of seminomadic

people as described in the Bible for the migrations of the patriarchs'. The represented data on the Kra eruption conform well with this archaelogical estimate.

It is possible that the Bible tale about the destruction of Sodom and Gomorrah combines collective memories from two events. Located in the Dead Sea region, Sodom and Gomorrah were destroyed by a natural disaster, which was most probably a strong earthquake or a flood provoked by such an earthquake, but the fresh memory about two settlements perishing from a volcanic eruption caused the population to equate these two events and it strongly enhanced the didactic effect of the legend. Such joining is characteristic of old legends.

A very interesting circumstance is synchronism between the climatic change for the worse and the geodynamic activation manifested by strong earthquakes and volcanic eruptions in the second half of the third millennium BC. The synchronism was found not only in the Near East, but also in the Armenian Highland (Trifonov & Karakhanian 2004). The combined effect of both groups of natural phenomena may have led to the social, economic and political crisis that took place in that time in the Oykumena.

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