THE PROBABLE CONNECTION OF LAKE VAN WITH NOAH'S FLOOD.

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LAKE VAN, in eastern Turkey in Asia, is a very large lake, of about 1,500 square miles. Its height is 5,680 feet above the sea, and it has no surface outlet.[1]

The remarkable point about it is, that six different valleys lead out of the depression in which Lake Van lies. That is, if the waters of Lake Van were raised by various amounts totalling 1,062 feet, it would empty itself by six wholly different routes, of which two lead to the Euphrates, and four to the Tigris. The "cols"[2] cover an arc of 85 miles, and high mountains usually lie between them. Now in the case of such depressions, geologists usually infer that the valley first formed must have got temporarily blocked, causing the formation of a lake, the waters of which rose until they found a different depression, which they proceeded to cut into a valley. In the case of the Lake Van depression, this blocking must have happened several times. Old shore lines have been noted round Lake Van, 15 feet, 40 feet, and 100 feet above its present level.

Only a rise of 260 feet would be needed to cause the lake to overflow by two widely separated valleys.

The blocking of the valleys was probably caused either by volcanic action or by glaciers.

The broadest valley leading from the Lake Van depression is that to the south-west of the lake. Six miles north of this valley is Nimrud Dagh, a very large volcano, with a crater over 4 miles in diameter. It erupted violently as recently as A.D. 1441, and was "rent asunder to the breadth of a city." A geologist writes: "An eruption of cindery basalt dammed up Lake Van." It appears from Felix Oswald's geological map of Armenia that lava has flowed from this volcano via the Bitlis valley for 30 miles. Lava would make a permanent dam, cinders a permeable dam, but volcanoes often emit mud, and mud would make an impermeable dam, but one that would give way rapidly once the water rose high enough to top it.

Several instances have been known of valleys having been so blocked by glaciers that considerable lakes have formed. In such

[1] The 4-miles-to-one-inch map published in 1919, says that Lake Van has a "periodic rise and fall of about eight feet, lasting five years each movement." There has been much speculation as to the cause of this. The most natural explanation is that a subterranean syphon must exist, with an aperture of such a size that it takes 5 years to run 8 feet off the lake. The rain then usually takes another 5 years to fill the lake up again, when the next strong wind towards the passage starts the syphon again. On the other hand, no known stream in the neighbourhood has a similar periodic rise and fall, nor does any spring come out of the ground so strongly impregnated with soda as the waters of Lake Van.

[2] A "col" is a neck between hills, or the top of a pass between mountains.

cases the material of the dam, being lighter than water, gives way with great suddenness, causing a flood very dangerous to life in the valley below. We shall also need to inquire whether a glacier could have come down as low as the level of Lake Van in Noah's time, for certainly they do not do so now in that latitude.

The best-known instance of a glacier creating a lake, is the creation by the Aletsch Glacier of the Marjölen See, north-east of Brieg, in the valley of the Upper Rhone. This lake is a mile long, by 550 yards wide, and is about 90 feet deep. T. G. Bonney gives half a dozen other cases, and writes: " Though a large mass of ice can act for a time as a dam, this is very liable to give way." He says that he once saw the Marjölen See drop 60 feet in twenty-four hours.

Bonney gives interesting details of the inundation of the valley of the Drance in 1818. It was caused by " the advance of the glacier of Gétroz, which dammed up the river and formed a lake about 10,000 feet long, 400 wide, and 200 deep ; containing, it was estimated, about 800,000,000 cubic feet of water. The danger of the situation being recognized, about two-fifths of the water was successfully drained off by means of an ice tunnel, and people in the valley were warned of their danger ; but the dam suddenly broke up, the water came down like a wall, and 50 lives were lost."

The case of a glacier blocking a tributary of the Indus, near its head-waters, will be fresh in every one's mind ; a very dangerous flood was the result. We were told that a flood similarly caused had once drowned a Sikh army. It is generally believed that the " parallel roads " of Glen Roy were due to a similar cause. If so, it proves that ice can hold water up to a depth of 700 feet.

Before considering whether a glacier could have come down as low as the level of Lake Van in Noah's time, it is essential that we assign some date to that much-discussed deluge.

Archbishop Usher put the date of the flood at 2448 B.C. It has long been recognized that this date is too recent. The Babylonian " King lists " would put it very much earlier, but if we adopt the recently proposed and reasonable method of assigning to these kings average reigns of twenty-five years, this gives the date for the great flood as 4500 B.C. say, 6,400 years ago. The evidence that the Ice Age was then not long past its greatest intensity is partly astronomical, but mostly geological.

Astronomical Evidence.

The obliquity of the ecliptic has, for the last 100 years, been decreasing steadily at the rate of 0·47 seconds of arc a year, but this would only amount to 50 minutes in the whole period, and, though it would mean an extension of the polar circle by 50 minutes, is hardly worth mentioning.

Astronomers do not profess to be at all certain about the cause of Ice Ages. The theory which they favour most is that the ellipse of the earth's orbit is elongated every 21,000 years. At present,

winter in the northern hemisphere occurs when the earth is nearest the sun, but 10,500 years ago the opposite condition prevailed, and there must have been a long succession of very cold winters. If this caused the last Ice Age, then at the date we are assuming for Noah's flood, 6,400 years ago, the Ice Age was indeed passing away, but the melting had not yet reached its fastest epoch.[1]

Geological Evidence.

Mr. H. H. Howorth, writing about the "Pleistocene flood," says that he is disposed to think that "it was one of a recurrent series of similar catastrophes . . . though far from being universal, it was certainly one of the most widespread catastrophes which the world has seen." It was "probably caused by the rapid and perhaps sudden upheavals of some of the largest mountain chains in the world." What follows here is not written in opposition to these upheaval theories.

The same author says: "We must allow that in the last period of the earth's history there was a development of glaciers on a large scale in nearly all latitudes where high land existed . . . this view . . . seems to be established beyond question."

The Aletsch Glacier in Switzerland descends to 5,500 feet, a little lower than the level of Lake Van. The latitude of the glacier is 46° 20′, of the lake 38° 20′. So we have to account for a glacier descending to the same level in 8 degrees of latitude further south.

Felix Oswald, in his geology of Armenia, mentions several glaciers still existing in the Armenian highlands. He writes of a "quite imposing glacier" on the west side of Ararat, and another "at the head of the great Akhury chasm descending to as low an altitude as 8,000 feet."

Now J. Geikie, in *Prehistoric Europe*, shows the ice cap on the Caucasus coming down to the shores of the Black Sea. These two latter facts, taken together, demonstrate that glaciers may have come down to the level of Lake Van (5,680 feet) long after the fastest epoch of melting of the Ice Age had passed.

Geologists have lately come to believe that the last Ice Age was much nearer our time than they formerly supposed.

Rocks like those at the head of Derwentwater, which have obviously been polished by ice, do not look as if they had been exposed to all weathers for more than 7,000 years.

Niagara receded 4·4 feet a year before so much of its water was taken for power purposes. The post-glacial gorge which it has cut

[1] Major-General Drayson claimed to prove that the pole of the heavens describes a circle round a point 6 degrees distant from the pole of the ecliptic in 31,686 years. That the minimum obliquity of the earth's axis to the plane of its orbit will be in A.D. 2295. That its maximum was in 13,548 B.C. and was 35½ degrees. Consequently 5626 B.C. was the fastest epoch of melting. If Drayson be right, it is certain that glaciers must have descended to Lake Van in 4500 B.C. It is quite possible that both Drayson's and the ellipse theories are true causes of the Ice Ages, and this may account for those ages occurring in groups.

is 7 miles long. In strict proportion this should have taken 8,400 years to cut. Gilbert puts it at 7,000 years.

By counting mud markings, De Geer seems to have clearly established that the ice margin retreated north past Stockholm only about 9,000 years ago.

Now considering that the height of Lake Van is 5,680 feet, it seems fairly certain that glaciers must have descended to its level 6,400 years ago, and one of these may easily have caused a temporary block, like that which recently happened on the Shyok tributary of the Upper Indus.

As regards the volume of the flood, the area of Lake Van is 1,476 square miles. If it rose 100 feet, its area would be 1,771 square miles. Taking the mean of these, we find that if the water ran off to its present level when the lake had been filled to the height of the 100-foot raised beach, it would send down 30 *cubic miles* of water. Now this is 5,600 times what the burst of the Gétroz Glacier sent down, even taking that figure at 800,000,000 cubic feet of water, which is obviously an over-estimate, as it is got by multiplying together the maximum length, breadth and depth of the temporary lake.

Let us take another instance to help us realize what a 30-cubic-mile flood means. It is 468 times the volume of the flood sent down by the bursting of the glacier on the Indus, taking the figures as published in the journal of the Geographical Society, and reckoning as in the last case. The topography is such, that the flood from Lake Van may have been 400 cubic miles.

The gradient of the valley down which such a flood would run is as much as 22 feet per mile for the first 200 miles, then 4 feet per mile for 240 miles, and then only 1 foot in 3 miles for the last 330 miles to the Persian Gulf. Needless to say, this marked flattening of gradient is precisely what makes for a great flood.

Sixty miles north-west of Mosul, or Nineveh, the Tigris comes out of the high hills, and from there to 20 miles south of Mosul the contoured map shows low rounded hills, all rising to about the same graded plane, and looking very much as though they were made of the coarser silt deposited by some tremendous flood.

To this we can now add evidence about the finer silt.

Mr. C. Leonard Woolley's article in *The Times* of 16th March, 1929, is headed: "The Flood. New evidence from Ur." The following are extracts from his concluding summary. "What we have then is this. First, evidence of an extremely early occupation in which two elements seem to combine; of its duration our work on the fringe of the island can give no idea. Then comes a catastrophe which buries the low-lying parts of the island, with its relics of human activity, under a huge bank of water—laid clay. On the top of this we have a fresh occupation which carries on some of the old traditions . . . only a flood—and that one of unexampled magnitude—could have deposited the 8-foot bank of clay which we have found overlying the original settlement of Ur—and we have found it, not in one spot alone, but in three, as much as 200 yards

apart. . . . The flood of Sumerian legend is also the flood of the book of Genesis . . . in no other way can I interpret the facts which our excavations here give us."

This is evidence that the flood came down from the mountains, and not up from the sea, as some have supposed. For the mud producing the clay would naturally be carried further than the coarse gravel, and would have been found near Mosul, not near Ur, if the flood came from the sea.

If the flood came down the Tigris, then Ur was a backwater, where the water stood almost stagnant for months.

Evidence from the Records.

The earliest version of the story of Noah's flood is the Sumerian. The late Dr. L. W. King, F.S.A., published in 1918 a book entitled *Legends of Babylon and Egypt in Relation to Hebrew Tradition.* He used early texts inscribed towards the close of the third millennium B.C. These texts are very much damaged, but say :

> " By our hand a flood will be sent
> To destroy the seed of mankind."

The missing portion of the fourth column must have described Ziusudu's building of the great boat in order to escape the deluge, for at the beginning of the fifth column we are in the deluge itself.

> " All the mighty wind-storms together blew.
> The flood . . . raged
> When for seven days, for seven nights
> The flood had overwhelmed the land.
> When the wind-storm had driven the great boat over the mighty waters."

The reader is requested to note the last line, as we shall have occasion to refer to this wind later.

Gilgamesh Epic.

The most important ancient version, outside of the Bible, is the Gilgamesh Epic. Mr. C. P. T. Winckworth, of Cambridge, has kindly given the author the following as the best translation :

> " For one day the de(luge . . .)
> Swiftly mounted up (. . .) mountain (. . .)
> Like a war engine it comes upon the people.
> By six days and nights the wind drives,
> The deluge tempest overwhelms the land,
> When the seventh day arrives the tempest subsides in the onslaught.
> Urragal tears out the mast."

The Gilgamesh Epic states that the man corresponding to Noah built the ark at Shuruppak, which has been identified in latitude 31° 35′ N. and longitude 45° 45′ E. If this be correct, then a flood coming from Lake Van would have emerged from the mountains 430 miles from where the ark was built. The waters would have spread themselves before they lifted the ark, consequently the bore wave did not cause the ark to capsize, but apparently gave it a very nasty flick, which caused it to lose its mast.

An Irish fisherman once told the author that he was sailing in the mouth of Bantry Bay, where there is a submerged rock on which waves break occasionally. He reckoned that it could not break at the then state of tide, and sailed over it. But it did break, and snapped his mast.

The portion of this extract most relevant to our subject is that about a war engine, because such, in early days, generally took the form of a tower, with battering ram below, which was *rolled* towards the fortress it was to attack. Mr. Bonney writes regarding the flood in the Drance Valley already mentioned: "It is said to have issued from the defile of Lourtier like a moving wall or mound, a hundred yards high, the head of the column of water being entirely masked by the confused mass of mud, stones, beams and trunks of trees which it swept along, and overhung by a dense cloud of dust. The people in the valley had been warned of their danger, nevertheless 50 lives were lost."

The advance of a war engine would appear to be a very apt illustration to use to describe floods caused by the bursting of glacier dams.

The mention of the dense cloud of dust in connection with the Drance disaster should also be noticed, because the Gilgamesh Epic mentions a "Black cloud" in connection with the flood it describes.

When a "bore" rushes up a tidal river, there is generally a main wave or "wall," but a good many rises after it. In the same way the flood caused by the bursting of a dam at Lake Van would probably "mount up" after the "wall" had passed. In the centre of the Mesopotamian plain this would probably take a whole day. If we attach weight to the two first lines of the foregoing extract, we can no longer believe that the flood was mainly due to rain. Nor does the Bible say so. In view of the size of Lake Van, it is easy to see that the flood might keep the same high level for five or six days more.

The Bible Account.

We now come to the Biblical account of Noah's flood.

This account says that the ark was 300 cubits long, 50 broad and 30 high; and these are very near the dimensions of a pre-Dreadnought battleship. But the Sumerian account says that the length and breadth of the ark were equal, and Dr. King remarks that, if so, it was probably like the circular coracles still used on the Tigris. But if made to the dimensions given in Genesis, its construction would be easier than if made circular, because one or two big logs would span it from side to side. It probably drew 15 cubits of water.

By saying that "the fountains of the great deep were broken up," the Bible hints that the flood was due to some cause in addition to rain. If the waters on Lake Van were nearly topping the temporary dam, then a bout of wet weather would cause the dam to overflow and burst.

The author has long held that Genesis vii. 20 has not received the attention it deserves. It runs, "15 cubits upward did the waters prevail, and the mountains were covered." Now 15 cubits was probably not more than 25 of our feet—a quite insignificant measurement compared to what we now call mountains, but sufficient to submerge all the artificial mounds and sand-dunes of the great plain of Mesopotamia. It would seem that the chronicler in the ark, seeing nothing but water, and knowing that the mounds were about 15 cubits high, stated that the water had risen that much. How much more, he had no means of judging.

Genesis viii. 3 implies that for 150 days there was nothing but water to be seen. The fourth verse describes the grounding of the ark at the end of that period—probably the first intimation the inmates received that the flood was running off. Two and a half months later the tops of mounds appeared,—very likely there were no high ones in the vicinity. Two months later, the plain began to dry, but, as there was no grass to be seen anywhere, while there still was forage in the ark, and as travelling to where grass could be got would be rendered very difficult by the fact that every depression was still full of water, Noah wisely waited another eight weeks before disembarking.

The Bible account certainly represents the flood as taking a very long time to run off. We have, however, seen that Lake Van might send down a most colossal flood. And the gradient of the Mesopotamian plain is so slight, that when the wind was from the south-east and strong, the water would hardly run off at all.

W. K. Loftus, in *Travels and Researches in Chaldæa and Susiana*, (*re* Bagdad) says, "The Tigris rose 22½ feet, and it was a full month before the people could ride beyond their walls."

Thus it would seem that we have hitherto been dealing with perfectly clear and credible statements, consistent with our idea of the flood proceeding from Lake Van.

Now we come to a more debatable passage, which must be noticed, lest we be thought to shirk the evidence, for Genesis vii. 4 states that the ark rested upon the mountains of Ararat, and not at the south-east end of the great plain, though we should expect a flood coming from Lake Van to carry it to the latter neighbourhood.

There seems scant reason why we should take this passage to refer to the particular peak we now call Ararat, which is unlikely to have been known to the author of the original record. It was more likely meant as a name for the whole of the Armenian highlands. The Jews have a tradition that the ark grounded on the Judi Dagh, which is east of Mosul, and about 50 miles south of Lake Van.

Other accounts state that it grounded further to the south and east on Mount Nisir.

It seems that we may assume that the ark grounded among the foothills north-east of the great Mesopotamian plain. Perhaps a south wind drove it up there; such a wind might easily cause a comparatively lightly laden ship to ride over the current, which

would not be strong so far from where the flood debouched upon the plain.

SUMMARY.

The raised beaches on the south shores of Lake Van prove conclusively that in past times its waters have stood at higher levels than they do now. The number of valleys leading from the depression of the lake imply that this was due to temporary blocks, and not to ordinary processes of denudation. These blocks may have been caused by volcanic mud, landslides or glaciers. Records show the latter to be a very probable cause, and it is known that, when ice-dams break, they do so suddenly.

We then found reason to believe that Noah's flood may be dated about 4500 B.C., at which date the last Ice Age would not have passed from so high a lake as Van.

We then noted the colossal volume of the flood that Lake Van could send down, the steepness of the drop, and the flatness of the great Mesopotamian plain. The low gravelly hills round Mosul, and the 8-foot bed of clay at Ur, both point to a very huge flood, which cannot have come up from the sea.

We then turned to the ancient records, and found that the Sumerian speaks of the flood overwhelming the land for seven days, while the Gilgamesh Epic says that it mounted up in one. The Biblical account is rather vague on this point. The description of the flood coming upon the people like a war engine, and the tearing out of the mast, both imply that the flood was extremely sudden. The Biblical account is perfectly consistent in its account of how the flood ran off, though the time it took to do so was longer than we should have expected.

Finally, we saw that the Biblical statement that the ark grounded on Ararat need hardly force us to abandon a theory for which there is so much evidence.

The Biblical and other documents all agree as to the fact of the flood : recent excavations at Ur confirm it : and the author trusts that the suggestion of a flood coming from Lake Van may explain as eminently reasonable what has hitherto appeared to be unlikely or incredible.

Those Fifty Years, by Bramwell Booth, C. H. (Cassell & Co., 7*s*. 6*d*. net), contains some further reminiscences of the late General of the Salvation Army. They throw an interesting light upon his early days and the home influence of his mother, and tell of the part he played in the expansion of the Army movement. There are recollections of associations with many interesting and important people, and stories amusing and pathetic illustrating the experiences of the officers. The whole series of memories gives an insight into the development of the Army from the days of struggle and persecution, and an impression of the work for God which has been accomplished.