

he had exhumed bore traces of having been gnawed; and later on Adams made similar observations.

Notwithstanding, however, the most diligent research extending over a period of twenty years, no further evidences of the presence of carnivoræ were forthcoming. These were the first remains met with.

Equally interesting was the discovery which was made in Trench v. Among the remains which were exhumed Mr. Arthur Smith Woodward has determined the third metacarpal of man. It was found at a depth of 3 ft. 6 in. from the surface, and underlying a layer containing pottery. It is probably of great antiquity, having been extracted from one of the earliest layers in the cavern.

That these deposits are of great antiquity there can be no doubt. The state of mineralisation in which the bones were found was most complete; and when, in addition to this, the height of forty feet above the gorge bed at which the cavern is at present situated be considered, in conjunction with the extremely slow and gradual character of the processes of erosion which were engaged in cutting down the bed of the gorge to its present level—when these, and the other equally important points regarding the great changes in climate that have taken place between this and then be duly weighed, the author thinks that he would be justified in referring the Har Dalam deposits to a considerably remote epoch.

Such then in brief are a few of the evidences bearing on the prehistoric history of the Maltese Islands which these excavations have supplied us with—evidences which have added one more arch to the bridge with which the geologist and the archæologist in the Maltese Islands are endeavouring to span the gulf which at present divides their labours.

GEOGRAPHY IN CAUCASUS.

A RECENT volume of the Memoirs (Zapiski) of the Caucasian Branch of the Russian Geographical Society (vol. xv.) is of more than usual interest. It opens with a paper, by Mr. Konshin, on the old beds of the Amu-daria, accompanied by a map which shows the consecutive decrease of the area of the Caspian sea since the beginning of the Post-Pliocene epoch. It is known that the Russian geologist was first to point out that what had been previously described as old beds of the Amu are not beds at all, but elongated channels occupied once by the salt waters of the Caspian. The writers of antiquity were not wrong in representing the Caspian sea as a basin, elongated from west to east, and in ignoring the existence of Lake Aral as a lake separated from the Caspian. At the beginning of the Post-Pliocene epoch, and perhaps later on as well, the Caspian sent eastward two wide gulfs, one of which reached the longitude of Merv, and covered what is now a depression in the south of the Kara-kum elevated plain; while another gulf, stretching north-eastwards, included Lake Aral and what is now the delta of the Amu, as far as Khiva and Pitnyak. Thus, it was not the Amu which reached the Caspian, but the sea which reached the river by extending much further eastward than it does now. The Chink, which has so often been described as an old bed of the Amu, was the northern coast of the Kara-kum gulf; while the river-like beds of the Sary-kamysh depression were narrow channels through which the waters of Lake Aral occasionally found their way into the Caspian, long time after the two great lakes had been separated from each other. Mr. Konshin's little map very well illustrates the subsequent changes of the form of the Caspian. It may only be added that an exploration of the Ust-urt, and especially of the chain of lakes which crosses it from west to east—connecting, so to say, the Caspian with Lake Aral—is extremely desirable; it seems very probable that another channel of communication between the two great lakes will be discovered in that direction as well. A. V. Pastukhoff's communication about his ascension on the Elbrus and the Khalatsa peak, in July, 1890, is also full of interest, and is accompanied by excellent photographs and a map. On the top of this latter peak, which reaches 11,915 feet, the party was overtaken by a snowstorm, during which they were surrounded by a most beautiful display of electric fires; all their fur coats, their hair, their moustaches, as well as the poles of their tents and all metallic things, were enveloped in luminous discharges, which came to an end only after a discharge of thunder. The thunderstorm was terrible, especially one discharge of globular thunder, which rendered all the party senseless for a time.

Dr. Dinnik's descriptions of his journey in Western Ossetia, as well as in Pshavia and Khevsuria, are full of valuable observations, especially as regards glaciers and traces of an extensive previous glaciation of the main chain. And Mr. Filipoff's remarks relative to the present changes of level in the Caspian, show that the level of the sea is continually oscillating in its different parts, and never remains quite horizontal; it depends very much upon the different winds.

Mr. N. Alboff's reports of his botanical explorations in Abhasia and Lazistan are most valuable, the more so as his conclusions relative to the flora of West Caucasus, very different from those arrived at by MM. Krasnoff and Kuznetsoff, are based on most elaborate studies and extensive collections.

Another important paper is contributed to the same volume by K. N. Rossikoff, on the desiccation of lakes on the northern slope of Caucasus. These lakes belong to three different categories. Those on the coasts of both the Caspian sea and the sea of Azov have originated from old lagunæ, or in the deltas of the rivers. They attain but a small depth (3½ fathoms is the maximum depth observed), and many of them are brackish. The lakes of the Steppe-region occupy distinct depressions of the surface, and are fed by little temporary streams and underground water. And, finally, there is a small number of lakes at the footings of the Main Ridge and in the mountain region itself. Now, all the lakes relative to which there are reliable observations made during the years 1881 to 1891, are decidedly in a period of desiccation. Most of the lakes of the Steppe-region have either entirely disappeared, or are living the last years of their existence; they will exist no more in a few years. The lakes scattered at the foot of the mountains are also in decrease; their levels have sunk during the last eight years of the above period by an average of ninety inches. As to the lakes of the mountain region, their desiccation seems chiefly to depend upon the destruction of forests. These facts entirely confirm the widely-spread belief that the climate of Caucasus is becoming more and more dry during the last forty or fifty years.

The volume is concluded with an extensive paper by Dr. Pantyukhoff, full of most valuable anthropological measurements of representatives of the various nationalities and tribes of Caucasus, and accompanied by many engravings.

ISOPERIMETRICAL PROBLEMS.¹

- Dido, B.C. 800 or 900.
 Horatius Cocles, B.C. 508.
 Pappus, Book v. A.D. 390.
 John Bernoulli, A.D. 1700.
 Euler, A.D. 1744.
 Maupertuis (Least Action), b. 1698, d. 1759.
 Lagrange (Calculus of Variations), 1759.
 Hamilton (Actional Equations of Dynamics), 1834.
 Liouville, 1840 to 1860.

THE first isoperimetric problem known in history was practically solved by Dido, a clever Phœnician princess, who left her Tyrian home and emigrated to North Africa, with all her property and a large retinue, because her brother Pygmalion murdered her rich uncle and husband Acerbas, and plotted to defraud her of the money which he left. On landing in a bay about the middle of the north coast of Africa she obtained a grant from Hiarbas, the native chief of the district, of as much land as she could enclose with an ox-hide. She cut the ox-hide into an exceedingly long strip, and succeeded in enclosing between it and the sea a very valuable territory² on which she built Carthage.

The next isoperimetric problem on record was three or four hundred years later, when Horatius Cocles, after saving his country by defending the bridge until it was destroyed by the Romans behind him, saved his own life and got back into Rome by swimming the Tiber under the broken bridge, and was rewarded by his grateful countrymen with a grant of as much land as he could plough round in a day.

In Dido's problem the greatest value of land was to be enclosed by a line of given length. If the land is all of equal value the general solution of the problem shows that her line of ox-hide should be laid down in a circle. It shows also that if the sea is to be part of the boundary, starting, let us say, south-

¹ A lecture delivered at the Royal Institution, May 12, 1893, by Lord Kelvin. Pres. R.S.

² Called Byrsa, from *βύρσα*, the hide of a bull. (Smith's "Dictionary of Greek and Roman Biography and Mythology," article "Dido.")