

On the geomorphology of Elma Dağı.
(SE of Ankara, Turkey)¹

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Elma Dağı is located a short distance southeast of Ankara. Papers on Elma Dağı describe it as a Palaeozoic massive, but the Mesozoic and Tertiary series play an important part in its structure.

Elma Dağı, because of its geologic structure, has two distinct flanks, which are also morphologically prominent: a - remnants of peneplains on the Palaeozoic schists and Permian limestone on the northwestern flank, b - hills and depressions on the southeastern flank developed by the gentle folds of the Oligocene series. The Dağ has been known as a Palaeozoic massive erroneously, because studies have been confined to the northern side; somehow completely neglecting the southern side. However, as far as a geologist is concerned, it may still be classified as a Palaeozoic massive.

Two peneplains are observed at 1400-1500 m. and 1100-1250 m., respectively. The higher peneplain is developed above the "exotic block series", the lower one on the Palaeozoic schists and greywackes. On the higher peneplain weathered lavas are seen between the Oligocene and Miocene strata. On the other hand, the same lava flows cover an erosional surface over limestones and greywackes at several localities. That is, lavas covered an erosional surface at the end of the Oligocene and peneplanation ended in the end of Miocene at the same level as those of the Miocene lakes.

The Moğan and the Balaban basins are filled up with Pliocene pebbles of 300 m. thick. The same pebbles also fill the old channel of Hatip Çayı. It is on these pebbles and the Palaeozoic greywackes at 1100-1250 m. that we see the lower peneplain which is also an epigenetic surface over which the rivers have shifted north because of uplifting of Elma Dağı and then cut down their new channels.

A similar shifting of rivers but in an opposite direction is observed southeast of Elma Dağı around Balaban Çayı. Today, these young valleys show typical entrenched meanders, the rivers flow in the well-known gorges and the basins of the region once filled with Pliocene pebbles since carried away. All these observations point out to the fact that the lower peneplain formed just after the deposition of the Pliocene pebbles. The following rejuvenation is probably of late Pliocene age.

¹ This is a summary of the second part of "A study of the geology and geomorphology of the region SE of Ankara in Elma Dağı and its surroundings". The summary given at the "8th. Geography Week of The Turkish Geographical Society" on February 18, 1953 at Istanbul. The study was a doctorate thesis offered to the University of Ankara under Professor W. J. Mc Callien, D. Sc. and Doç. Dr. R. İzbirak in 1947-1950 and it will soon be published by The Mining Research and Exploration Institute of Turkey.

The well-developed peneplains north of the Elma Dağı are moderately developed in the south where by rapid erosion of serpentines and the Oligocene conglomerates, only hills, instead of a peneplain, remained. Here, also a syncline and an anticline are observed indicated by a topographic low and high respectively, whose axis parallel the line adjoining the peaks of the hills. The eastern part of the main depression is originally a syncline, later eroded by rivers. The western part is a graben. The subsequent streams follow the depression and the consequent south in channels cut across the anticlinal hills towards Balaban Ovası.

Morphological evolution: although seems that since Palaeozoic times Elma Dağı has been a high, its present form evolved after the Eocene. The thick Oligocene strata indicate the intensity of erosion during the Oligocene which was followed by a period of volcanic activity. In Miocene times high points on the Dağ formed an island (High peneplain). As a result of Miocene and Post-Miocene movements formed at about the same level as the surface of the new pebble deposits and as a result of the continuous uplifting of Elma Dağı, the streams of the basins shifted and cut down their channels in the lower peneplain.

The latest uplifting has not been continuous as indicated by the stream terraces. In the Balaban and the Ankara basins two systems of terraces at relative heights of 20-40 and 80-90 are observed.

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² This is only a short list.

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³ This article has been issued after our thesis.