

## **Çamlı ile Değirmenağzı (Zonguldak) arasındaki karboniferin satıh haritası**

G. ZIJLSTRA <sup>1)</sup>

*Özet: Maden Tetkik ve Arama Enstitüsünün 1946 dan beri Zonguldak karbonifer havzasında yapmakta olduğu araştırmalar münasebetiyle verilen raporlarda ve yapılan neşriyatta karbonifer sahreleriyle kretase örtüsü bahis konusu olmuştur. Bu yazıda bu müşahedelerin bir hulâsası verilmiş ve karboniferin bulunması beklenen derinliklere dikkat çekilmiştir. Bir münhaniler hartasile gösterilen derinlikler kretase başlangıcındanberi vaki olan tektonik hareketlerin karbonifer sathı üzerindeki tesirleri göstermektedir, Karboniferin strüktürel durumu etraflı bir surette mütalâa edilmiştir.*

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## **A contour map of the surface of the Carboniferous between Çamlı and Değirmenağzı (Zonguldak)**

G. ZIJLSTRA <sup>2)</sup>

Summary: In the framework of the Carboniferous investigations carried out by the M.T.A.E. in the Zonguldak coal basin since 1946, some reports and publications were issued, dealing with Carboniferous and with the Cretaceous cover thereof. A summary of these observations is contained in this article, in which special attention is paid to the expected depth of the Carboniferous which is expressed in a contour map, which shows the influence of the tectonics since the beginning of the Cretaceous sedimentation in the surface of the Carboniferous. The tectonical structure of the Carboniferous is broadly outlined in the text.

This region is situated about halfway between Zonguldak and Ereğli on the Black Sea coast of Northwestern Anatolia.

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1) M.T.A. Enstitüsü jeologlarından. Makalenin alınış tarihi 18/7/1949 dur.

2) Geologist at M.T.A. Institute. Manuscript received by the editor 18/7/1949.

In this region surveys have been made by ARNI, CHARLES, PATIJN, TOKAY and ZIJLSTRA, which led to several publications and reports, of which the most important ones can be found in a list at the end.

By taking the results of these surveys into consideration, a contour map was constructed of the surface of the Carboniferous, which is also the plane of the Cretaceous transgression.

The contours were constructed on the principle of constant thickness of the different parts of the Cretaceous, but the data concerning changes in thickness were taken into consideration. This can be done for those regions where the valleys are eroded deep into the under-Cretaceous. It is known, that in general, the changes in thickness of the lower Cretaceous are rather gradual, so that estimations of the thickness between valleys will not give rise to inexactitudes which are not in accordance with the allowance due to contours with a difference of 250 m.

The accuracy decreases however, where Cenomanian crops out. Thanks to ARNI it is known that during the Cenomanian, rather elaborate landslides took place, which gave rise to the occurrence of big blocks of Carboniferous and lower Cretaceous embedded in Cenomanian "Flysch". These landslides may have caused local and rather elaborate increases in thickness as well as the rubbing off of the underlying strata, which can be hidden from observation and thus cannot be accounted for.

If we call the tectonics, which took place since the beginning of the Cretaceous sedimentation, Postcretaceous, then we might call the structures found in the Carboniferous, Precretaceous, in order to simplify the nomenclature. The structures of the Carboniferous, as they can be seen now are, however, the result of all the tectonical movements since the sedimentation of the Carboniferous. But to distinguish between the structure of the Cretaceous and that of the Carboniferous the expression Precretaceous will do for the latter.

The Postcretaceous tectonics are expressed in the features of the contour map. Broadly outlined we see an anticline in the West which broadens in the East and which has there a depression in the crest,

forming two secondary anticlinal ridges. In the middle near Çavuşağzı exists a depression, separated from the higher contours of the Carboniferous of Kireçlik by two big faults. ARNI showed, that the forming of these anticlinal structure started already in the under-Cretaceous, giving rise to reduced thicknesses of the Velibey sandstone and the underlying Barremian limestones. He also mentions, that these uplifts have partially the features of a ridge fault. This is only true for some of the inliers, and even there, not everywhere.

The map shows more fault in the vicinity of the inliers than elsewhere. The surveys of the inliers and their immediate surroundings have been made on a scale of 1: 2000, a study of the details being of the greatest importance for mining. The other regions have been studied on a scale of 1: 10.000, and here of course not so much attention has been paid to details as in the surroundings of the inliers. Therefore the conclusion, that the inliers and their surroundings should be more faulted than the rest is not acceptable, nor does it mean, that for the whole region only the most important faults are given, as concerns their dimensions. A fault of 25 m. far away from an inlier is not as important as a fault of the same dimensions in a mining district.

The Carboniferous outcrops in this region, which are all situated on the crests of the Postcretaceous anticlinal structures, belong to three types:

- a. The outcrops surrounded by Cretaceous basis conglomerate, e. g. in Çatakdere, Kirenlik and between Teflenni and Alacağzı.
- b. The outcrop or inlier has the shape of a ridge fault, e. g. the Southwestern part of the inlier of Alacağzı, Kireçlik and parts of the inlier East of Ilıksu.
- c. The outcrops of the Carboniferous <Klippen> in the Cenomanian, the result of the submarine landslides in that time.

CHARLES (2) found two very small outcrops of Carboniferous (Namurian) surrounded by Velibey sandstone in a small valley West of the inlier showing Carboniferous limestone and Namurian where Ça-

takdere joins Ilıksudere. In general, the plane of transgression is considered as having been flat at that time, so that it is covered with basis conglomerate and limestone with a thickness of between 0 and 100 m. (6, p. 7), as can be found around the inliers of the first type. Perhaps these small inliers found by CHARLES are due to the original higher ground in the plane of transgression, which was not covered with sediments till the Aptian.

Only relatively small parts of the Carboniferous are visible. In the West, near Kandilli, we see sterile Namurian in the South and productive Westphalian in the North, both with almost vertical inclinations. In Alacağzı we see, with the exception of the seam Kesmeli, sterile Westphalian in the South overlying productive Namurian in the North, with Southward dips of 30-55°. This productive Carboniferous continues under the Cretaceous to Kireçlik-Kirenlik and most likely to Çatakdere, where the dip is again almost vertical. North of this line, Carboniferous limestone exists in the upper Ilıksudere and in the Southern half of the inlier of Değirmenağzı, where the limit between the Carboniferous limestones and the Namurian is formed by a fault, giving a stratigraphical gap in the Namurian of at least 600 m. because the total thickness here is about 200 m. between the Carboniferous limestone and the Westphalian of the ridge between Değirmenağzı and Öküşneğzı.

All the Namurian of this Northernmost Precretaceous anticline is sterile. The strike varies between N 25-80° E and the dip is rather vertical in the East and about 40° N at Gürleyükdere. Broadly outlined there exists a synclinal structure in the Carboniferous in the West where the Southern flank is found near Kandilli and the Northern flank at Alacağzı-Kireçlik with indications of the axis only in the workings in the seam Kesmeli at Kirenlik.

The core of the anticline North of this synclinal structure shows Carboniferous limestones on the Eastern part of the map. The Northern part of this anticline seems to be faulted parallel to the axis.





Summing up we see a Postcretaceous anticline with a transversal depression near Çavuşağzı and a longitudinal one East of that place. The Cretaceous, which demonstrates these structures, covers a Precretaceous, syncline and an anticline, of which the axes are almost parallel to that of the Postcretaceous structure.

When we compare these facts with the map of CHARLES (7) it appears likely, that his line indicated as <Plis hercyniens> must be understood as the possible border of what is left by Precretaceous erosion of what once has been the total Carboniferous sedimentation area.

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### Bibliografya — Literature

#### Reports :

- 1 — ARNI, P. On the region between Köseğzı and Çavuşağzı, 1939 7
- 2 — CHARLES, F. On the Cretaceous between Alacağzı and Ilıkı, 1947-1948.
- 3 — PATIJN, R. On the Carboniferous of Çamh-Kandilli, 1948.
- 4 — TOKAY, M. On the Cretaceous between Alacağzı and Alaplı, 1948
- 5 — ZIJLSTRA, G. On the Carboniferous of Kireçlik - Alacağzı, 1948 - 1949

#### Publications :

- 6-ARNI, P. Zur Stratigraphie und Tektonik der Kreidesehichten ostlich Ereğli an der Schwarzmeerküste. Ecl. Geol. Helv. Vol. 24, No. 2, 1931.
  - 7-CHARLES, F. Observations sur les terrains de couverture dans les bassins carbonifères du nord - ouest de l'Anatolie, Bull. Geol. Soc. Turkey, Vol I. No. 2, 1948.
  - 8-RALLI, G. Le bassin houiller d'Héraclée, Istanbul, 1933.
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