

# SEDIMENTARY FACIES OF A 60.85 M CORE FROM KONYA BASIN, TURKEY

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In 1991, a 60.85 m continuous core was collected from the Konya basin (37° 45' 13.3'' N and 32° 43' 5.4'' E) which is located in the western part of the Anatolian Plateau Turkey, where there were a number of important ancient civilizations. The core sediment consists of a continuous lacustrine accumulation of homogeneous silty clay and clay with shell bands, sand streams and organic-rich accumulated layers. It also contains visible gypsum crystals suggesting the existence of dry climatic condition in the past. Three ash layers were also recognized at 7.72-7.77 m, 12.15-12.20 m and 51.5 m in depth. The preliminary radiocarbon datings of the shells collected from 6 m depth are older than 40 kyr BP. The detailed analysis of this core may make it possible to reconstruct a long-term environmental record such as interglacial-glacial cycles occurring about every 100,000 years during the past million years. This report is a sedimentological description of the core samples from the Konya Basin.

*Key words:* KONYA, LITHOLOGY, PALEOENVIRONMENT, ANATOLIAN PLATEAU.

## INTRODUCTION

Study of lacustrine deposition has great potential for paleoenvironmental reconstruction. A 60.85 m continuous core was taken from the Konya basin (approx., 10, 000 km<sup>2</sup> in area), which is located in the western part of Anatolian Plateau (latitude 37-38 °N and longitude 32-35 °E and at an altitude of about 1000 m), sandwiched by the Pontus and Taurus Mountains (Fig. 1 and 2).

Today, the climate of this region is continental: hot, dry summer and long, cold winter. In July, the highest and lowest mean daily temperatures at the town of Konya is 30 °C and 15 °C, respectively. In January, in contrast, the highest and lowest mean daily temperatures are 4 °C and



Fig. 1. Photograph of core sampling at the Konya Basin.

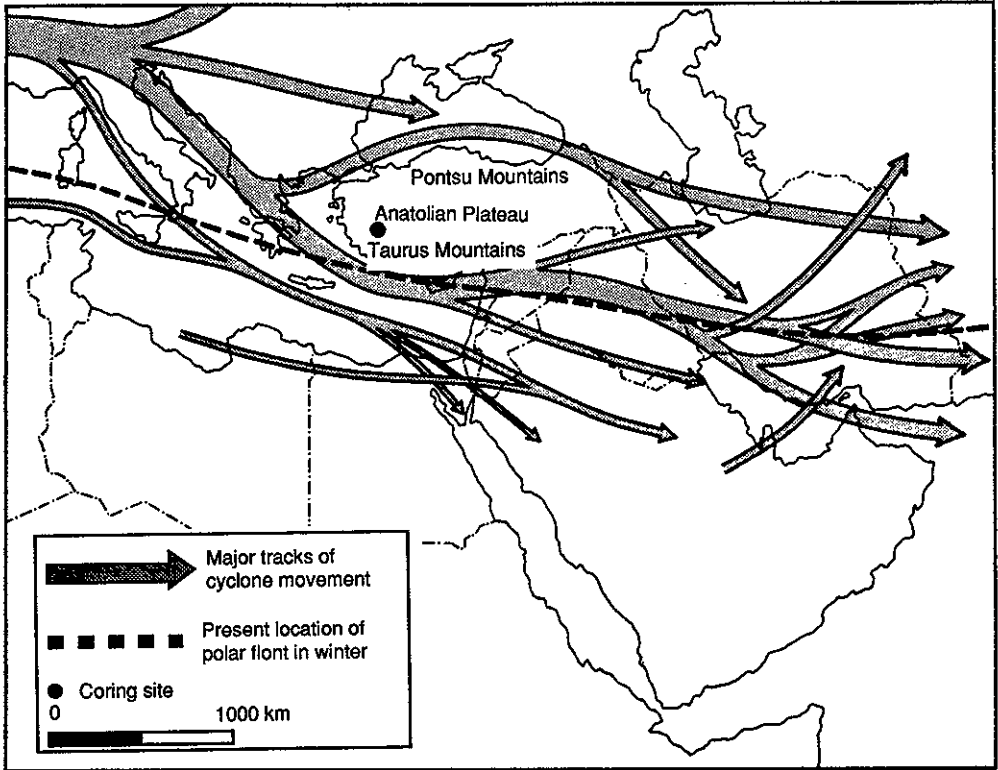


Fig. 2. Cyclone tracks over the Middle East (Beaumont *et al.*, 1988) and coring site ( $37^{\circ} 45' 13.3''\text{N}$  and  $32^{\circ} 43' 5.4''\text{E}$ ), which locates in the western part of Anatolian Plateau where lies between the Pontus and Taurus Mountains.

$-5^{\circ}\text{C}$ , respectively (Meteorological Office, 1966). The annual mean precipitation at Konya is as low as 300 mm. This climate is considerably disrupted by a succession of cyclones which pass over the region (Fig. 2). Cyclones are wave disturbances generated along the polar front, separating polar and tropical air masses. They develop over the Mediterranean particularly, but also over the North Atlantic, then travel westward over the Middle East (Meteorological Office, 1962). During the summer, the paths of the cyclones tend to pass north of the Pontus Mountains, and therefore, their effect on the climate of this region is minimal. A quite different pattern occurs with the path of the cyclones displaced southward over the Mediterranean and the Middle East in winter. As winter progress, very cold air mass develop over the high Anatolian Plateaus and these tend to exercise a steering effect on the cyclones, causing them to pass either northwards or southwards of the main mountain masses.

It has long been recognized that the environmental condition of the Anatolian Plateau were not always as they are today (Robert *et al.*, 1979; Roberts, 1983., Naruse *et al.*, this volume). Rock paintings from the Caralhöyük, which lies on the Anatolian plateau about 50 km south-east of the town of Konya, suggest a well watered land, rich animal lives. At Beyşehir Gölü which is located in the 100 km north from the town of Konya, pollen diagrams confirm that the vegetation and climate were considerably changed during the past 15 ka (Bottema and Woldring, 1984). It is

obvious that the climate of the Anatolian Plateau has highly fluctuated in the past.

### LITHOLOGY

During the mechanical drilling, and the removal of the core sediment from the coring tube by water pressure at the coring site (Fig. 3), the lengths of the core sediments were modified. Assuming a constant shortening or lengthening of each core, and that the bottom depth of each core sampling is its reference depth, the changes in length of the collected core sediments were corrected.

The correction range is within  $\pm 20\%$ .

Figs 4a-4f show the detailed sedimentological descriptions of the cores from the Konya basin. The core sediments consist of:

- 1) white/light brown clay and light gray clay, probably consisting of calcareous lacustrine sediments, of chemical precipital origin. Gypsum crystals are present in considerable amounts in some layers, suggesting



Fig. 3. Photograph of taking out sediment from coring tubes.

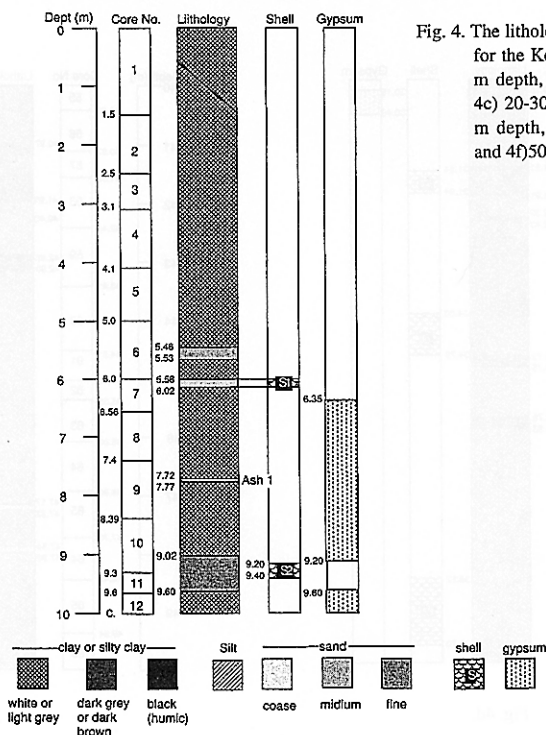


Fig. 4. The lithology of core sediment for the Konya Basin, 4a) 0-10 m depth, 4b) 10-20 m depth, 4c) 20-30 m depth, 4d) 30-40 m depth, 4e) 40-50 m depth and 4f) 50-60.85 m depth.

Fig. 4a.

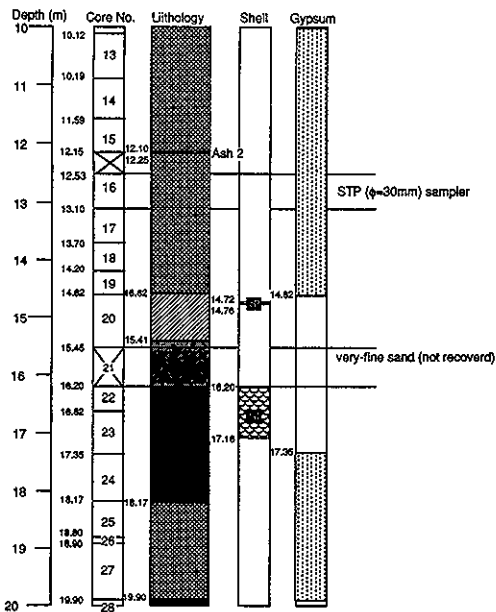


Fig. 4b.

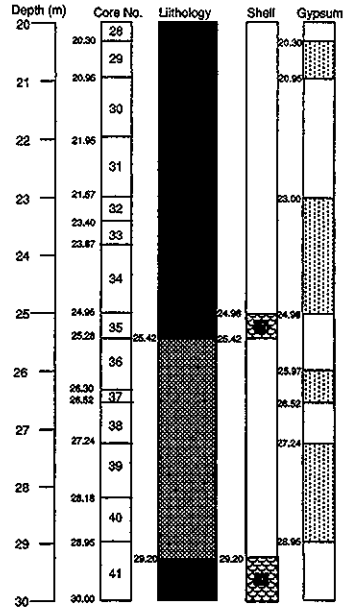


Fig. 4c.

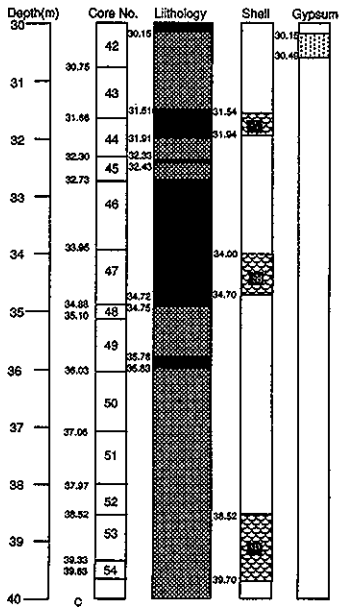


Fig. 4d.

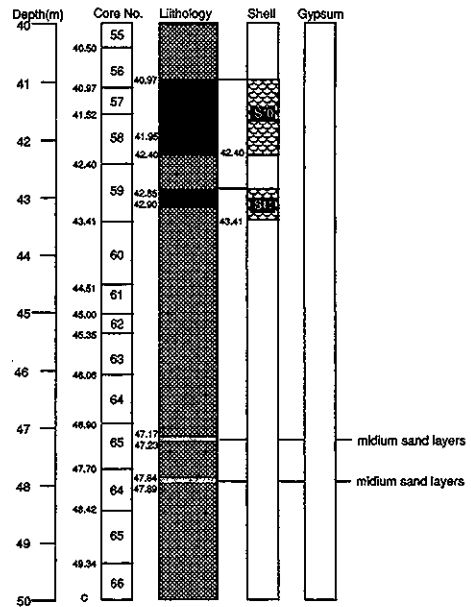


Fig. 4e.

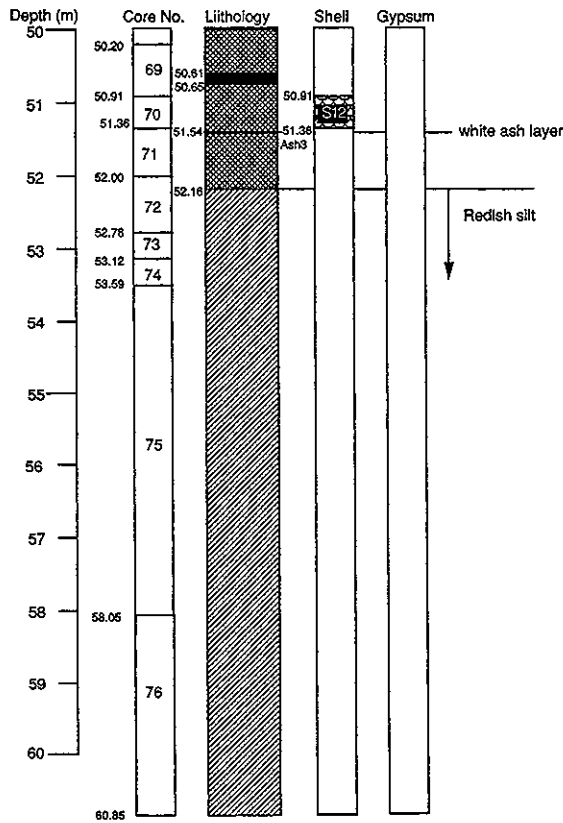


Fig. 4f.

that the deposition with gypsum crystals occurred in a shallow saline lake in a hot and dry climatic environment (Inoue and Saito, this volume). Such sediments are deposited in arid or semiarid regions where evaporation is quite high.

- 2) dark-gray or dark-brownish clay with a number of shell fragments, being non-salt sediments such as the aeolian dust and/or river clays. They formed in less saline water and low evaporation or high precipitation.
- 3) three ash layers of 7.72-7.77 m depth (5 cm thickness), at 12.15-12.20 m in depth (5 cm thickness) and at 51.5 m in depth (<1 cm thickness). The origins of these tefra layers are currently unknown.
- 4) sand streams, typically 1-10 cm in thickness.
- 5) the redish silty-clay and clay.

### CONCLUSION

Several types of analyses of the 60.85 m core from the Konya Basin are in progress and will aid a reconstruction of the long-term environmental changes in the Anatorian Plateau, the birthplace of some of the earliest civilizations in the world. The results from these core samples

from the Konya Basin may throw new light on environmental changes around the Anatorian Plateau, in relation to the human history.

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トルコ・コンヤ盆地からの60.85m柱状堆積物の層相

北川浩之・安田喜憲

要旨：古代文明が栄えたアナトリア高原の西部に位置するコンヤ盆地において、1991年ボーリング試料採集を実施した。本稿において、コンヤ盆地から採集された60.85m柱状堆積物の層相について報告する。