Neogene Stratigraphy in Western Cuba: New Data

Abstract A study of two petroleum exploration wells in the southern part of Pinar del Rio Province shows that the Neogene lithofacies complex can be divided into two subcomplexes. The first, in the Palacios basin, consists of 1,000 m of Aquitanian through Vindobonian carbonate and terrigenous clastic strata. The second subcomplex, outside of the Palacios basin, consists of 800 m of carbonate rocks, in which Aquitanian strata are absent and the post-Aquitanian Miocene overlies the Paleogene directly.

The Mariel-Carroguao fault, which is the eastern border of the Pinar del Rio Miocene lithofacies complex, was active at least as early as Oligocene time.

INTRODUCTION

In an earlier description of the stratigraphy and tectonics of the Cuban Neogene (Iturralde, 1969), I divided the westernmost part of the island into two lithofacies complexes based on the structural and facies characteristics of the sedimentary sequences.

The westernmost complex, Lithofacies Complex I, underlies southern Pinar del Rio Province and is terminated on the east at the Mariel-Carroguao fault; east of the fault, Lithofacies Complex II occupies the region between the Mariel-Carroguao fault and another fault farther east between Cárdenas and Cuchinos Bay. The Isle of Pines (Iturralde, 1969, Fig. 2) is excluded from these two lithofacies complexes.

The data used in the 1969 study of the lithofacies complexes of western Cuba, particularly Lithofacies Complex I, came from surface geology investigations and samples taken from shallow wells (200 m). The data from deep exploratory wells (drilled by American companies) in the region were not used. Now the data from some of these deep wells have been evaluated, particularly those from Baños No. 2 and Guanal No. 1A (Fig. 1). These data necessitate modification of my previous conclusions, because the lithofacies and tectonic characteristics of the western Cuban Neogene are more complex than indicated in my earlier paper.

The lithologic and faunal data given here are from the original well reports. On the basis of these reports, the ages of the sedimentary rocks are reinterpreted within the framework of the Neogene stratigraphic sequence proposed earlier (Iturralde, 1969, Fig. 1).

LITHOFACIES COMPLEX I

A comparison of the early to middle Miocene (Aquitanian-Vindobonian) sedimentary rocks of the Baños No. 1 and Guanal No. 1A wells shows that a considerable thickness of these strata is present in the Baños No. 1 in the Palacios basin. In the Guanal No. 1A, along the northern margin of the San Diego de los Baños tectonic unit (Furrazola et al., 1964), Aquitanian rocks are absent. The marked difference between the sections in the two wells indicates that the wells are in distinct geologic provinces which existed concurrently during Miocene time. In the Palacios basin sedimentation was uninterrupted during all of early and middle Miocene time; in contrast, in the area of the Guanal No. 1A well, erosion took place after Paleogene time and lasted probably until the end of Aquitanian time.

On the basis of the deep well data, Lithofacies Complex I is divided into two subcomplexes. One coincides with the Palacios basin and the other with the San Diego de los Baños tectonic unit (Fig. 1).
Subcomplex 1

The Palacios basin is a depression which subsided markedly as thick (1,000 m) early to middle Miocene neritic sediments were deposited. The section includes both carbonate and terrigenous clastic rocks. The early to middle Miocene strata overlie a predominantly terrigenous Oligocene sequence that was deposited in waters of medium depth, and definitely deeper than the water in which the Miocene sediments were laid down. The Miocene is both conformable and gradational with the Oligocene. However, south of the basin, the Miocene strata are discordant on pre-Oligo-
cene units. The characteristics of the strata in this subcomplex were described in my earlier (1969) paper and are shown generally in the columnar section for Bafios No. 2 well (Fig. 2).

Subcomplex 2

The strata of this subcomplex are predominantly carbonate, 800 m thick, and evidently correspond in age to the Soritiidae-Miliolidae-Amphisteginidae zone (Iturralde, 1969, Fig. 1). This subcomplex is present in the northern part of the San Diego de los Baños tectonic unit—and this margin is a high fault block (Furrazola et al., 1964, Fig. 88). The lithologic section of Guanal No. 1A is characteristic of the subcomplex. It consists of organogenic limestone and dolomitized limestone with shale and fine-grained sandstone interbeds (Fig. 2). The Typically neritic thanatocoenosis consists of *Archaias angulatus*, *Penetropilis proteus*, *P. planatus*, *Cyclorbiculina compressa*, miliolids, and *Amphistegina* spp. In the more brackish parts of the section, *Elphidium sagrum*, *Ammonia beccarii parkinsoniana*, ostracods, and other forms are present. The fauna is approximately uniform in all localities.
Conclusions for Lithofacies Complex I

On the basis of the data presented here, Lithofacies Complex I consists of two main subcomplexes: subcomplex 1 with 1,000 m of neritic carbonate and terrigenous clastic rocks; and subcomplex 2 with 800 m of neritic deposits, mainly carbonate.

Lithofacies Complex I is separated from Lithofacies Complex II by the Mariel-Carraguao fault which is of pre-Oligocene age. At the end of Oligocene time, the area of Lithofacies Complex I was uplifted; the northern margin of the Palacios basin was exposed and eroded; the northern margin of the San Diego de Los Baños tectonic unit (which had been a lowland during Oligocene time) became moderately to greatly uplifted; and sedimentation continued uninterrupted in the main Palacios basin. After these events took place, general subsidence began in the whole area of Lithofacies Complex I. It was not until the end of Vindobonian (middle Miocene) time that the entire area became stable and emergent.

As a result, Iturralde's (1969, Fig. 13) paleogeographic reconstruction for the early Miocene has to be modified because of the existence, during Aquitanian time, of land south of the Palacios basin (Fig. 3).

Lithofacies Complex II

The lithologic characteristics of the early to middle Miocene sequence (Aquitanian through Vindobonian) of Lithofacies Complex II are observed in the Guira No. 2 well section (Fig. 2). This is the same as that given in my earliest paper (Iturralde, 1969), and is presented in Figure 2 for comparison with Lithofacies Complex I. It is apparent that the geologic histories of the areas underlain by the two lithologic complexes were quite different, as noted in my 1969 paper.

References Cited
