

## Contribution to the Oil Geology of the Middle Magdalena Valley.

The clear compilation made by the geologists of the Petroleum Companies working in Colombia, entitled: General Geology and Oil Occurrences of the Middle Magdalena Valley. Bogotá, 1955, suggests the Instituto Geológico Nacional to contribute to the solution of the problem of the distribution of oil fields. <sup>in that zone.</sup>

First of all, a view on the general structures which participate in the oil distribution of the Middle Valley, will be given. This valley, as outlined in the above paper, will be referred to as Carare Basin.

### Position of the Carare Basin.

The adjoined map, called Croquis de las Unidades Geológicas de Colombia, reproduces <sup>the main geological</sup> points of view of the main subdivisions of Colombia, ~~from~~ which lead the further explanations. The boundaries between the ranges and the interandine valleys (valandinos), for evolutionary reasons, are more or less arbitrary.

The Carare Basin is a part of the Magdalena-Cesar Valley, bound by the Eastern and Central Cordilleras.

The CENTRAL CORDILLERA, in front of the Carare Basin presents an E inclined, ~~penneplain~~ slightly block-faulted peneplain, transversally more or less defined between the Cauca-Magdalena watershed and the Magdalena foot of the range. Longitudinally, the peneplain starts ~~more or less~~ approximately at Ibagué, continues to the depression of El Banco and is well defined on the SE slope of the Santa Marta Massif.

In relation with the Carare oil distribution, it seems essential that the peneplain in front of the Basin, is divided into two units, one E of the line Puerto Berrio-Nechí and the other W and S of it, the latter being called the ~~Antioquia-Tolima~~ "Middle" Peneplain and the former Tamar section.

The ~~Middle~~ Peneplain Tamar section ~~of the peneplain~~ is composed on the E side typically of slightly metamorphic slates with porphyritic intrusions; the wide W slope, properly the peneplain, shows, ~~now~~ so far known porphyrites on the slope, acid intrusives, acid to basic extrusives, pyroclastics, red beds and the marine liassic member of Morrocoyal. Towards the foot of the slope, following the slope dips the Morales-Arenal Cretaceous is preserved; there is no doubt that this part of the peneplain was covered by ~~xrsta~~ post-barremian Cretaceous in the limy-shaly facies.

In strong contrast with the Tamar section, the Middle Peneplain is made up of acid intrusives ~~with~~ and strongly metamorphic schists. This crystalline basement slopes down into the SW part of the Carare Basin, more or less from the San Juan river towards the Cretaceous front of the Velasquez field and from here via Cambao towards Piedras-Rovira. Neither Giron nor Cretaceous is found in all this emerged and submerged portion of the peneplain, except for one outcrop of Lower Cretaceous with plants at the very top the Central Cordillera, on the San Felix road, N of Manizales, in east-andian facies, found by W. Nelson. This indicates, that the Cretaceous became denudated from the Middle slope.

The boundary line between Tamar and Middle Peneplains, can be thus traced from Nechí-Puerto Berrio to the rio San Juan (tributary

At lower levels, the Central Cordillera and the peneplain towards the Santa Marta Massif. The peneplain is not a single unit, but a series of ranges, mostly of the Carare Basin, which are separated by the peneplain.

In accordance with this definition, the Carare Basin is not only covered by the peneplain, but extends southward to the line Cambao-Piedras-Rovira. A clear northern boundary at the peneplain is well marked, it may be transitional.

This part of the peneplain is covered with plants, perhaps a lower Eocene feature.

of the Carare) towards Honda, Rovira a.s.o. Thus a geological division of the Carare Basin takes place, the parte E of the line with slates, Giron and Cretaceous and the part W of it with crystalline, ~~without Giron~~ without Giron and practically without preserved Cretaceous, and covered on the lower slopes by thick ~~miocene~~ Real. The larger number of the oilfields rests E of the line, while on the W side so far only the Véasquez field has been developed, failures having occurred between Pto. Berrio and the Ermitaño river. *following the land front of the C. and, i.e. the Cambrothrust*

The MAGDALENA ~~valley~~ CESAR VALLEY can be divided into the Cesar Basin in the NE and the Carare Basin in the S, separated by the Tamalameque swell. According to *tertiary sediments, entire, gushing toward W.*

The Tamar section of the peneplain comprehends the wide E slope of the Tamar massif, ~~bound to the~~ The ~~short~~ W side is composed typically of slightly metamorphic ~~shales~~ of the ordovician type of Cristalina, W of Puerto Berrio, which are <sup>also</sup> well exposed between Nechi and La Raya. Partly they show a higher degree of metamorphism, and crystalline limestone lenses, and marly slates, are markers. Above these slates, ~~on the~~ the peneplain seems to be composed of porphyritic intrusions of de jura-triassic = Giron type; towards the foot of the peneplain, appear acid intrusions, confusive acid and basic extrusives and pyroclastics, ~~red beds~~ some chert, red <sup>sandy, conglomeratic and clayey</sup> beds and the marine liassic Morrocoyal member, ~~of~~ jura-triassic age which is <sup>all together is believed to be</sup> called the "pyroclastic facies" of the Giron. Between Simiti, Morales and Arenal, the porphyritic rock is overlain by Lower Cretaceous beds, practically starting with the big limestone member of Arenal of supposed barremian and aptian age. The dip of the Cretaceous coincides with that of the slope and can be followed to the E to the top of the Cretaceous uppermost Cretaceous. Thus it is evident that the peneplain slope continuous for some extension into the Magdalena valley. The facies and the dip of Simiti-Arenal Cretaceous ~~indicate~~ prove the Cretaceous to have covered the entire slope and the presence of barremian and aptian ammonites at Loma Hermosa, NW of Medellin, indicates an interfingering with the typically volcanic Cretaceous of Westandean-Colombia (W of the crest of the Central Cordillera).

In strong contrast with the Tamar slope, but connected with it by a transicional zone (Puerto Berrio-Malena type), ~~the~~ the Middle Peneplain is mostly made up of acid intrusives considered to be paleozoic, but partly probably ~~mesozoic~~ juratriassic and even lower tertiary (Ovejas diorite of Scheibe and Grosse). The other rocks are strongly metamorphic schists, ~~supposed to be~~ supposed to be greatly a ~~met~~ contact-metamorphic facies of the Ordovician. ~~Above~~ Neither Giron nor Cretaceous are found on the Middle Plain, except for an outcrop, found by W. Nelson at the crest of the Central Cordillera of the San Felix road, N of Manizales. Thus, ~~it can be supposed that the Middle Peneplain was covered~~ The conglomeratic beds with shales contain cycadaeae ascribed to the middle Cretaceous. Thus, the Middle Peneplain may have been ~~included in the Cretaceous~~ covered by Cretaceous, ~~denudated~~ denudated in Eastandean facies, but became denudated about ~~Lower Eocene~~ lower eocene time. - The same as occurs with the Tamar slope, happens with the Middle Peneplain; it dips ~~into the Magdalena valley~~ gently into the Magdalena Valley and becomes covered by thick tertiary sediments, extinguishing toward the Central Cordillera, but no Cretaceous nor Giron are present. This fact can be followed toward Honda Ibagué and as far E as the <sup>Cambao</sup> - Piedras thrust (see Velasquez sections of Texas in the report of the oil companies), showing thus that the part of the Carare basin which ~~corresponds to~~ covers the Middle Peneplain extends S as far as Piedras-Rovira-Ibagué-Picalañña.

The subdivision of the Carare basin into two parts, belonging to the ~~covered~~ Tamar, respectively Middle Plain type. The boundary line between both can be traced where E of the line the Cretaceous appears or may be supposed in the subsurface. It would run along the Cambao thrust from Piedras (Tolima) toward <sup>East of the</sup> the Velasquez field, then N along the upper San Juan (tributary of the lower Carare) with a doubtful connection towards the rio Regla.