## GEOLOGICAL REPORT CPMS-310. PARAÍSO-MARAURE AREA (CENTRAL FALCÓN)

J. W. R. BRUEREN
Maracaibo 28th October 1949
**(Texto completo 31 p. y 3 mapas en DVD anexo, carpeta 094)**

A number of basic igneous plugs and sills were discovered in the region southwest of the known igneous outcrop of Cerro Maraure, Cerro Agachiche and Cerro Mataire. All the evidence indicate that the igneous has intruded the Paraíso beds, which may be of Eocene or younger age, and the Túcua shale which are definitely Oligocene. It appears that the igneous activity was approximately contemporaneous with these two formations, because the igneous rocks associated with the Túcua shale show an extrusive phase at some places, and because at one place the Paraíso beds re transgressive over the igneous.

The tentative conclusion is reached that this area of igneous activity corresponds to a line of weakness in the axis of the Tertiary geosyncline. This interpretation is in contrast with Kehrer's hypothesis, according to which the line of weakness coincides with the edge of the Cretaceous geosyncline.

Only little mapping was done, because the main object of this investigation was to determine the position of the igneous. The data gathered were sufficient however to construct a number of somewhat diagrammatic cross-sections.

No conclusions are submitted concerning Cretaceous prospects because practically no new information was obtained on that subject. It is of interest though that the igneous of Cerro Travesado includes contact metamorphic limestone blocks which could possibly mean that a calcareous facies of the Cretaceous is present at depth.

A review of the adjacent areas indicates that there is a possibility of Tertiary oil accumulation in the region southeast of the surveyed area.

The report is accompanied by four supplements: A: Microforaminifera, by J. J. Hermes (22nd December, 1949). B: Macroforaminifera, by B. van Raadshooven (13th October, 1949). C: Comments on palaeontology, by J. U. Todd (22nd December, 1949). D: Comments on geology, by H. J. Fichter (8th February, 1950).

## IGNEOUS ROCKS OF THE SIQUISIQUE AREA

Gustavo R. CORONEL & E. J. C. KIEWIET DE JONGE
Maracaibo, June 1957. C.S.V.
**(Texto completo 41 p. y 1 mapa en DVD anexo, carpeta 095)**

The presence of Cretaceous chert, shale and limestone in the andesitic and diabasic masses plus absence of Tertiary material in them, strongly suggests an Upper Cretaceous age for these igneous bodies, although it could well be that volcanic activity in the area extended into Paleocene time. Contrary to P. F. C. Kiewiet de Jonge's opinion, the fine grained igneous are here classified as submarine extrusions, rather than shallow intrusive or dykes, on the basis of the observed pillow-lava structures already mentioned. The possibility of some of this igneous being intrusive is not discarded, for igneous activity in this area must have resulted in the emplacement of diverse igneous bodies, as well as in extrusion of andesitic and diabasic lavas.

The predominant tectonic feature in the Las Tinajitas area is the roughly west-east trending fault separating Cretaceous and Eocene sediments. The northern block has been uplifted in relation to the southern block. In addition, numerous small faults are present, notably in between the Cretaceous sediments and the gabbroic igneous, having a general NW-SE trend.

Some relatively large anticline and synclinal folds are evident in Oligocene sediments, and they have accordingly been incorporated into the map. Fig. 4 is an idealized section through the area, showing the most important stratigraphic and tectonic relationships.

No oil shows or indications of any sort have been found in the area.

## SECOND VERTICAL DERIVATES OF TOTAL MAGNETIC INTENSITY NORTHWESTERN VENEZUELA

GULF RESEARCH & DEVELOPMENT COMPANY
Pittsburgh, PA, June 1959
**(Mapa en DVD anexo, carpeta 096)**

The enclosed map at scale 1:500,000 summarize the aeromagnetic survey of Northwestern Venezuela, displayed as a Second Derivative Map of the Total Magnetic Intensity. The areas with more complex and steep contours are those of: a) South of the Oca fault near the La Paz and Mara fields, b) Goajira Peninsula near Cojoro, c) Southern half of the Paraguaná peninsula, d) East of Tucacas. That feature reflects the nature and structure of the igneous basement.

In the Tucacas - Yumare region the contours display sharp and straight contacts that suggest blind faults that delimit the northwestern-most extent of the buried igneous-metamorphic rocks of Cordillera de la Costa partially covered by the Neogene formations, against the thick Tertiary Falcon basin sediments. The nearest metaigneous rocks crop out in the Yumare massif at the Yaracuy-Falcon border area.

## GEOLOGY OF THE BARQUISIMETO-SIQUISIQUE-CHURUGUARA REGION STATES OF LARA AND FALCÓN

H. F. HAZEL
Caracas, November 1958. Mene Grande Oil Company
**(Texto completo 85 p. y 3 láminas en DVD anexo, carpeta 097)**

The stratigraphic section consists of sediments from lower Cretaceous (Aguardiente equivalent) to Pliocene or younger and unconsolidated Quaternary deposits.

Orogenic forces brought about a sharp change in the conditions of sedimentation after the deposition of the Misoa-Trujillo group. The Falcón basin, which originated in the upper Eocene with the deposition of the Santa Rita conglomerate upon the Misoa-Trujillo group, is roughly outlined in its southern limits by the Unión anticline.

All of the sedimentary rocks of the central Lara-Falcón area show appreciable deformation. Misoa-Trujillo and older rocks are more complex structurally than the Agua Negra group and younger. At least four periods of tectonism occurred after the middle Eocene.

Large-scale submarine sliding is largely responsible for the disorder of the Southern area. Very large bodies of Cretaceous lithologies slid into Paleocene sediments from submarine structure along the edge of the Barquisimeto trough.

Igneous and metamorphic rocks form major exposures to the south and to the east of Barquisimeto, but the only igneous rocks in the study area consist of basic rocks of hornblendite and pyroxenite which crop out near Algodones. Most of the Cretaceous sediments show low-rank metamorphism. Near La Economía the sediments of the Cretaceous? Undifferentiated show the greatest metamorphism.

The regional trends of the northern area are roughly N80E while there is very little recognizable regional trend in the southern area.

Two major structures are present: the Bobare anticline of the southern area and the Unión anticline of the northern area. The major faults associated with these structures are longitudinal.

To the north of the Unión anticline and extending to Churuguara is a series of nearly parallel anticline and synclines cut by longitudinal and transverse faulting.

## GEOLOGICAL REPORT Nº CPMS-295. PART D. PETROGRAPHY OF SIQUISIQUE REGION (FALCÓN-LARA)

J. HEERING
April 26th 1949
**(Texto completo 41 p. en DVD anexo, carpeta 098)**

The Rocks studied for this report belong to the Basement, the Juro-Triassic (La Quinta), the Cretaceous and Eocene, and include Basic and ultrabasic igneous that is believed to be of post-Cretaceous age; some Rocks show contact-metamorphism.

The igneous rocks which Renz believes to belong to the basement are considered to be of post-Cretaceous age because the Cretaceous and Tertiary conglomerates do not contain any pebbles of these, though they do contain various types of basement and La Quinta rocks. Renz speaks of "basic igneous", in the sense that he means, does, in fact, occur. Moreover typical contact-metamorphosed limestone occur both in Renz´ collection and in an old collection made by Kehrer and no limestone older than Cretaceous are known as yet from the investigated area.

## GEOLOGICAL REPORT Nº CPMS-324 ON THE SIQUISIQUE-RIO TOCUYO AREA

P. F. KIEWET DE JONGE
Maracaibo 10th April 1950. C.S.V.
**(Texto completo 36 p. en DVD anexo, carpeta 099)**

In Los Algodones and Chorreron the intrusive Rocks, gabbro and diabase, were considered by Kehrer (ref. 1) to be post-Cretaceous in age and by O. Renz (ref. 2) pre-Cretaceous. At two places an intrusive contact could be studied between gabbro or diabase and La Luna limestone or shale. Upon examination under the microscope some samples appeared to be contact metamorphic rocks. A study was made also of Kehrer's Misoa-Trujillo series. The conclusion is reached that part of it is Cretaceous, and part Eocene in age. As the name Misoa-Trujillo series does not cover strata of Cretaceous age, the name Calichal formation is proposed for these deposits. Diabase dykes penetrate also into this formation. The report contains four enclosures, as follows:

Appendix I: paleontological examination of samples from the Siquisique-Rio Tocuyo area, by J. J. Hermes & R. W. Barker.

Appendix II: note on the paleobotanical examinations from the Siquisique-Rio Tocuyo area, by O. S. Kuyl & J. Muller.

Appendix III: list of petrographical determinations, by P. F. Kiewiet de Jonge. Re-studied by V. Streiff.

Comments: by V. Streiff.

## ISOPACH MAP OF THE CAUJARAO FORMATION AND EQUIVALENTS

José Gregorio MÉNDEZ & Edgar H. GUEVARA
Caracas, 30 de julio de 1969. C.S.V.
**(Mapa en DVD anexo, carpeta 100)**

Se presenta un mapa a escala 1:250.000 que abarca toda el área de la Península de Paraguaná y Falcón occidental, incluyendo las áreas marinas y la península de la Goajira. Se muestra la distribución de espesores de la Formación Caujarao y en tierra firme aparece la información de geología de superficie.

## GEOLOGY OF THE LOWER RIO TOCUYO BASIN

Brígido R. NATERA
December 1948. Creole Petroleum Corporation.
**(Texto completo 64 p. y 6 láminas en DVD anexo, carpeta 101)**

A detailed stratigraphic study of southeastern Falcón necessitates revision of the early concept of one or more ridges of Eocene in the Oligo-Miocene depositional basin, since rock-stratigraphic units are believed to be

continuous. Casupal and Agua Linda type sections were detailed and correlated with Bachacal and Riecito of the Riecito Structure and with Guacharaca in Salto and Menecito of Mene Acosta. Unconformable over these lie the Policarpio glauconite and Capadare limestone, which are correlated, contrary to Renz's published biostratigraphy. In spite of numerous listed fossil species the base of the Miocene is only dubiously placed within the Casupal.

## GEOLOGICAL REPORT Nº CPMS-277. PARAGUANÁ PENINSULA

Otto RENZ
December 1948. C.S.V.
**(Texto completo 53 p. y material adicional en DVD anexo, carpeta 102)**

The report is concerned essentially with the Cretaceous. The other formations were examined only so far as necessary to solve the problems of the Cretaceous.

The pre-Cretaceous basement consists of older metamorphic schists and of the younger Paraguaná granite, which may be compared with the Palmar granite of Perijá area.

The Cretaceous shows a clastic facies, with intercalations of arkose and conglomerate between slate, quartzite, limestone and chert. All these strata are semi-metamorphic and they are cut by igneous dykes.

The transgressive Tertiary begins with the Middle Miocene, comparable to the La Rosa of the Bolivar coast. The Eocene reported by Kehrer is not confirmed.

No oil indications were found in the Cretaceous. In the Miocene, there are impregnated sandstone, and limestone smelling of oil. Of particular interest are corals showing patches of oil in their interior which seem to demonstrate that the oil originated in the Miocene rather than from the Cretaceous.

The oil prospects for the Cretaceous are not, considered as promising. It is possible that small stratigraphical accumulations are present in the Younger Tertiary, although the surface indications are poor.

The report is accompanied by five supplements as follows: A: Subsurface data on Paraguaná by J. W. R. Brueren, p. 20 (may 1949). B: Photogeology of Paraguaná by G. H. Voorwijk, p. 22 (aug 1948). C: Petrography of Paraguaná by J. Heering, p 24. D: Macrofossils from Paraguaná by A. N. C. ten Broek, p. 32 (nov 1948). E: Comments by H. J. Fichter, p. 37 (18-2-1950).

## EL BASAMENTO Y LAS ROCAS PALEOZOICAS EN LA PARTE NORTE DE VENEZUELA

Foster D. SMITH, Jr.
Caracas, agosto 1980
**(Texto completo 71 p. y 3 láminas en DVD anexo, carpeta 103)**

Se clasifica el basamento cristalino superficial en tres provincias: Cratón Precámbrico (3.600-1.000 Ma), Basamento Paleozoico (500-175 Ma), Basamento Mesozoico (128-66 Ma)

El cratón Precámbrico del Escudo de Guayana, sin haber sufrido un evento termal posterior, puede extenderse en el subsuelo hasta un lindero septentrional que pasa a lo largo del río Apure hasta San Fernando de Apure, luego al sur de Las Mercedes, estado Guárico, y de ahí hasta la Cordillera de La Costa de Anzoátegui y Monagas.

El Basamento Paleozoico, mayormente compuesto de rocas ácidas intrusivas de edad paleozoica y a veces triásica, se encuentra desde el lindero río Apure-Las Mercedes hasta la provincia del Basamento Mesozoico. Se verifica su presencia desde Perijá hasta Barinas occidental (Agua Linda-1) y hacia el oriente en El Baúl y en los pozos GXB-2 y 8, unos 50 km al oeste de Las Mercedes, estado Guárico.

La existencia del basamento de edad Precámbrica y Paleozoica en Los Andes y en Perijá indica una extensión anterior del cratón Precámbrico, luego afectado por eventos tectónicos y termales posteriores. En el pozo Agua Linda-1 se encuentran feldespatos pegmatíticos de edad 865 Ma asociados con moscovita de la pegmatita y de los esquistos, moscovita cuya edad es de 463 a 406 Ma. La edad de los feldespatos pertenecientes a la intrusión pegmatítica es del Precámbrico. El isócrono de 433 ± 50 Ma sería la edad del último evento termal (Silúrico).

La orogénesis de Los Andes y Perijá en el Terciario Superior debería estar representada por rocas cristalias no aflorantes de la misma edad geológica.

El basamento Mesozoico, en gran parte alóctono, se extiende desde la península de la Goajira, a través de Falcón y de la Cordillera Central, hasta la faja metamórficas de Araya-Paria. Su lindero meridional es, mayormente, una zona de fallas de corrimiento. En dicha provincia se encuentran rocas pre-Mesozoicas: el Complejo Yumare

(Precámbrico?) en Falcón oriental, un granito de edad Paleozoica Superior en la península de Paraguaná, y el complejo metamórfico de Sebastopol-El Tinaco de edad Paleozoica Inferior en la Cordillera de la Costa. Además, se encuentran en el pozo MTC-1 (68 Ma) costa afuera al oeste de la isla de Margarita.

## GEOLOGY OF SOUTH CENTRAL FALCÓN AND NORTHWESTERN LARA AND THE REGIONAL STRATIGRAPHY AND OIL POSSIBILITIES OF OLIGOCENE AND LOWER MIOCENE SEDIMENTS TO THE FALCÓN BASIN

Charles B. WHEELER
September 1958. Creole Petroleum Corporation
**(Texto completo 149 p. y 21 láminas en DVD anexo, carpeta 104)**

The area discussed in retail in this report covers some 4500 square kilometers in south central Falcón and northwestern Lara. The latter part of the report deals with the regional stratigraphy and oil prospects of the Oligocene and Lower Miocene sediments throughout the Falcón basin.

The complete sedimentary section exposed in the area mapped in detail is approximately 9500 meters thick. The rocks range in age from Paleocene to middle or upper Miocene. The Paleocene and Eocene rocks are mainly marine shale, with lesser amounts of interbedded sandstone and conglomerate. From oldest to youngest, the formations present in this interval arc: Trujillo, Misoa, Paují, Santa Rita, Jarillal. The Misoa Formation, a group of interbedded sandstone and shale, is present only in the western part of the area. Eastward this formation grades mainly into the lower Paují shale. A prominent angular unconformity separates the Paují from the overlying Santa Rita Formation.

Oligocene and Miocene rocks are a series interbedded shale, sandstone and limestone which were deposited in shallow water on the southern flank of the Falcón basin. In general these sediments are relatively more marine to the north and less marine to the south. They change facies rapidly. The Churuguara Formation of Mio-Oligocene age is at least in part equivalent to the following formations which are exposed in the mapped area: El Paraíso, Pecaya, Castillo and Casupal. The lower part of the overlying Agua Clara shale also grades southward into the upper part of the Churuguara Formation. In the northern (basinward) part of the mapped area, the Churuguara, or its equivalent, lies on the Jarillal Formation with apparent conformity, although paleontological data suggest that the contact is disconformable. Farther south the Churuguara equivalent lies with angular unconformity on older Eocene rocks.

The Agua Clara shale overlies the Churuguara Formation in all localities except in the southwestern corner of the area where the Cristian Formation overlies the Churuguara. The Cristian is a shallow water facies of the Agua Clara. Both formations are lower Miocene in this area.

The Cerro Pelado Formation overlies the Agua Clara conformably. The Isnotú is younger than the Cerro Pelado, but lies on the Agua Clara unconformably. The Isnotú is exposed only at the western edge of the area.

Folds are the most prominent structural feature in this area. They trend N70E and extend for long distances. They are normally considerably complicated by subsidiary folding and minor faulting. The trend of the folding bends sharply southward at the western end of the area approaching the Serrania de Trujillo.

The most prominent faults in the region trend N60W. They appear to be strikes slip faults. There are also two sets of normal faults, one trending north to northeast, the other trending northwest. There are also a few reverse faults in the area, which trend parallel to the strike and which are confined to the north flanks of the synclines.

Oil prospects in pre-Trujillo rocks are poor because drilling depths appear to be economically prohibitive.