ID 2680

REPORT GPH N. 120

T O T A L M I N E R A R I A

SEISMIC REINTERPRETATION

PERMIT B.R109.MI

TOTAL MINERARIA EO309/418

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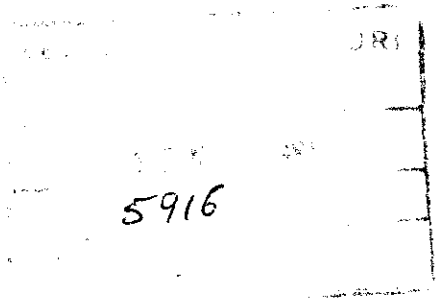
TEP/DE/GPH



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LIST OF ENCLOSURES

Encl. 1	:	D 32	Isochrons	(1/50.000)
Encl. 2	:	D 40	"	(1/50.000)
" 2 bis	:	D 40	" (with seismic anomalies)	(1/50.000)
" 3	:	D 50	"	(1/50.000)
" 4	:	D 70	"	(1/50.000)
Encl. 5	:	D 32-D 40	Time Isopachs	(1/50.000)
" 6	:	D 32-D 50	" "	(1/50.000)
" 7	:	D 40-D 50	" "	(1/50.000)
" 8	:	D 50-D 70	" "	(1/50.000)
Encl. 9	:	D 32	Isobaths	(1/50.000)
" 10	:	D 50	"	(1/50.000)
" 11	:	D 70	" (from migrated sections)	(1/50.000)

1. INTRODUCTION

The purpose of this interpretation of the permit B.R109 was to integrate to the former surveys the seismic results of the CGG 1980 survey. This:

- first, in order to better define the structural forms which were known down to the Lias.
- Second, to try to determinate the structural features of a deep horizon which could be the Permo-Trias, and that, thanks to the better quality of the 1980 seismic survey.

2. DOCUMENTS

We have used the following documents:

- CGG survey 1980 (CDP 4800%). Migrated and unmigrated sections. They are of a very satisfactory quality.
- Sefel survey 1980 (CDP 4800%). Unmigrated sections are poor down to the Lias and very poor below.
- Digicon survey 1971 (CDP 2400%). Unmigrated sections are of an average quality.

3. CALIBRATION AND HORIZON IDENTIFICATION (Fig. 6)

The calibration of the picked horizons has been done from the synthetic seismogram of the GEM 1 well.

The following horizons have been identified:

- D 32 : Base of Tertiary (near Top Scaglia Calcarea)
- D 40 : Top of Fucoid Marls
- D 50 : Top of Lias dolomite

Furthermore D 70 could be related to the Permo-Trias.

We have brought a -20 ms twt time correction from DP to the Sefel sections.

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4. RESULTS

4.1 - D 32 Isochrons (Encl. 1)

The Gargano Est Marine (GEM) structure is better specified.

4.2.- D 40 Isochrons (Encl. 2)

The same structural features are noticed than at D 32. We also noticed some little tops in the SW of the permit. On one map (Encl. 2 bis) we have colored in grey the seismic anomalies which are included between D 40 and D 50. These seismic anomalies might be reefs. Eventually they are orientated NW-SE which is the regional trend of the faults in this area.

4.3.- D 50 Isochrons (Encl. 3)

At this horizon the Gargano Est Marine structure shows a stronger gradient.

On the North of the line B.R109-14, the direction change of the isochrons' contours indicates the presumable occurrence of a wrench fault. Some little structures can be seen on the Western and on the South Western parts of this block.

4.4.- D 70 Isochrons (Encl. 4)

We have picked the D 70 horizon with great difficulties, particularly on the Sefel and Digicon lines. Eventually the CGG 1980 lines, which show better quality for this horizon, have been taken as a network to establish this map.

This isochron map has been obtained from migrated and unmigrated sections: this is to take into account to explain the numerous festoon of the isochrons' contours.

We have contoured this map on the Gargano (GEM) structural area and we could not extend it to the South-West of the line B.R109-14. Because the horizon is loosing its character SW of the probable wrench fault area.

There are families of faults, orientated NW-SE on the Gargano structure s.w. flank.

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4.5.- D 32 - D 40 Isopachs (Encl. 5)

Some thinning is noticeable along the GEM anomaly indicating the structure was active at this time. (It is still even active now as it can be seen on sea bottom isobaths as well as on shallower isopachs' maps submitted in July 1979, R. Templier report GPH21).

4.6.- D 32 - D 50 Isopachs (Encl. 6)

The GEM anomaly is well seen

4.7.- D 40 - D 50 Isopachs (Encl. 7)

Some thinning is noticeable along the GEM anomaly indicating the structure was already growing. The axis of maximum thinning is 2 to 4 km SW of the axis at D 32 - D 40. This indicates the folding axis was moving NE during Jurassic-Cretaceous times.

4.8.- D 50 - D 70 - Isopachs (Encl. 8)

We can see two areas of thinning on this map: the first one is on the B.R109-08 line, South of the GEM 1 well; the other one is on the B.R109-04 line.
We consider these local thinning as presumably related with interval velocities variations.

5. DEPTH CONVERSION

The depth conversion down to D 50 (top lias dolomite) has been made using the interval velocities given by the Gargano Est Marine well.

Sea level - sea bottom	:	1500 m/s
Sea bottom- D 32	:	1900 m/s
D 32 - D 50	:	3200 m/s.

To convert into isobaths the D 70 horizon, we tried to establish the interval velocity law D 50-D 70 in fonction of this interval thickness using the average stack velocities and the Dix formula (fig. 2). We could not obtain an interval velocity law as points on figure 2 are very scattered.

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On figure 3 are displaid:

- a time section of the line B.R109-80-08 to show the time isopachs variations of the D 50- D 70 interval.
- the same time in isobath with a 6000 m/s D 50 - D 70 interval velocity. An height is noticeable between SP 250-400. We consider this height as related to lateral velocity variation in the interval.
- Moreover, on this figure, we suggested different isopachs obtained from different interval velocities (lateral variations are supposed and indicated on the document).

As per these computations we realise the height may disappear. Anyhow we have then several hypotheses but not any obvious solutions to retain.

Finally, the T = f (P) law (fig. 1) was chosen for depth conversion of the D 70 horizon.

The figure number 4 and 5 are representing the depth sections of the B.R109-80-08 and 09 lines. They give the shape of the D 70 horizon obtained with the two hypotheses:

V50-70 = 6000 m/s and GEM 1 extrapolated velocity Law.

6. ISOBATHS

6.1- D 32 and D 50 Isobaths (Encl. 9 & 10)

The isobaths for the D 32 and D 50 horizons have been obtained using the interval velocities from GEM1 well. For the D32 isobaths the variation of the water depth in the area has been taken into account.

On these isobaths we can see the same features that on the correspondant isochrons.

6.2.-D 70 Isobaths (Encl. 11)

The values of isobaths map has been made from the velocity law obtained at GEM 1 down to 2000 m and then extrapolated taking into account the CGG 1980 interval velocities computed from stack velocities (fig. 1).

The isobath map then obtained has the same features that the isochron map.

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7. CONCLUSIONS

This report indicates the occurrence of seismic anomalies (between the fucoïd marls and the lias top) which might be reefs. This prospect seems rather doubtful as we are probably in conditions similar to the Gargano platform reefs (cf. SONIA 1 failure).

Indeed, these reefs have been built in porous carbonate surroundings where the lateral closure perhaps does not exist. Moreover, we don't see any closure at the top of these reefs, that is to say on the D 40 horizon.

On the deep prospect appears a large interesting structure closed on an overlapping fault, at the level of the probable Permo-Trias. The areal extension of this structure can reach 16 km^2. Its vertical closure is 1000 m. The base of the evaporites should be close to 4600 m.

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Paris, 15.7.81

fig 1

T = f (P)

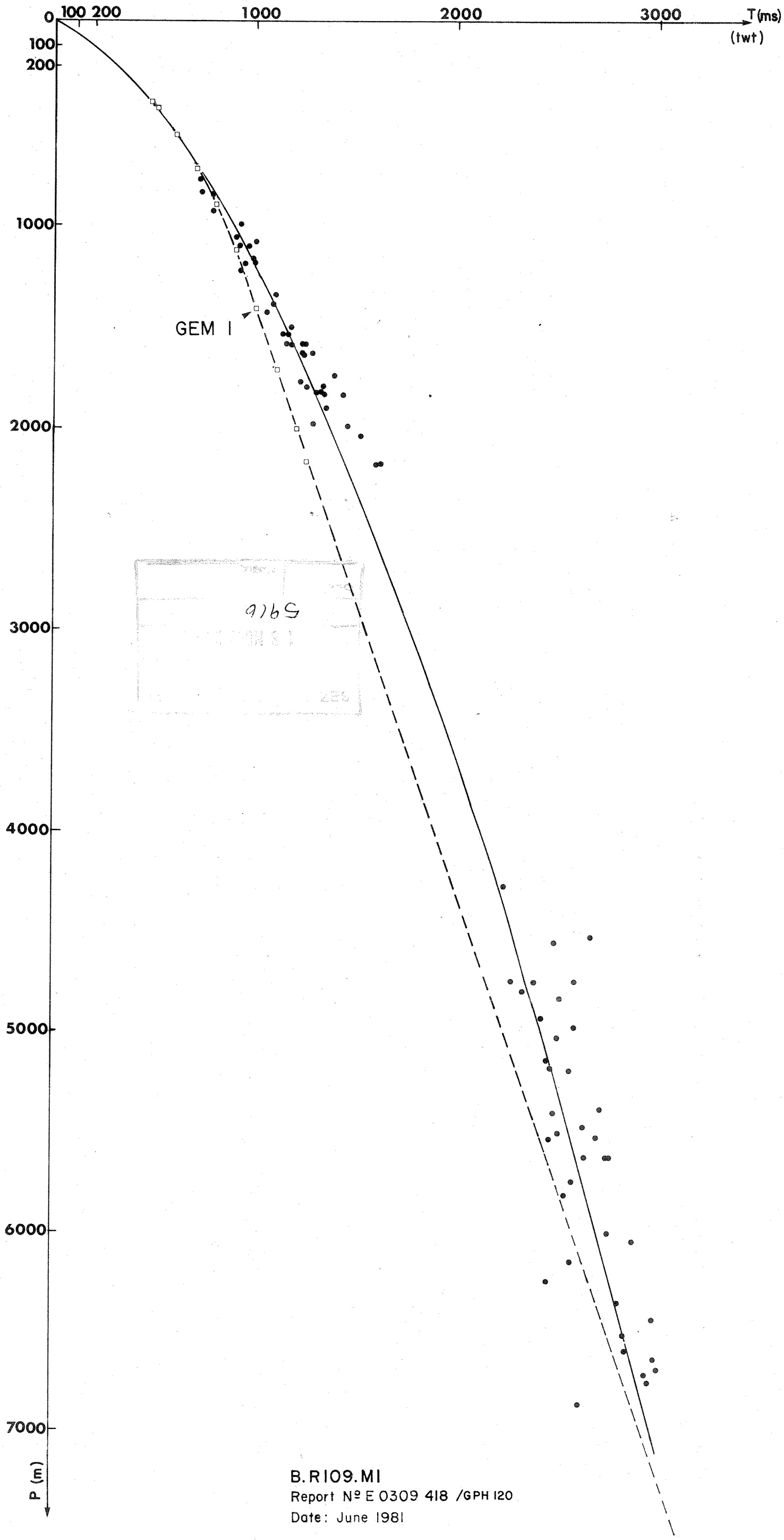

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fig. 2

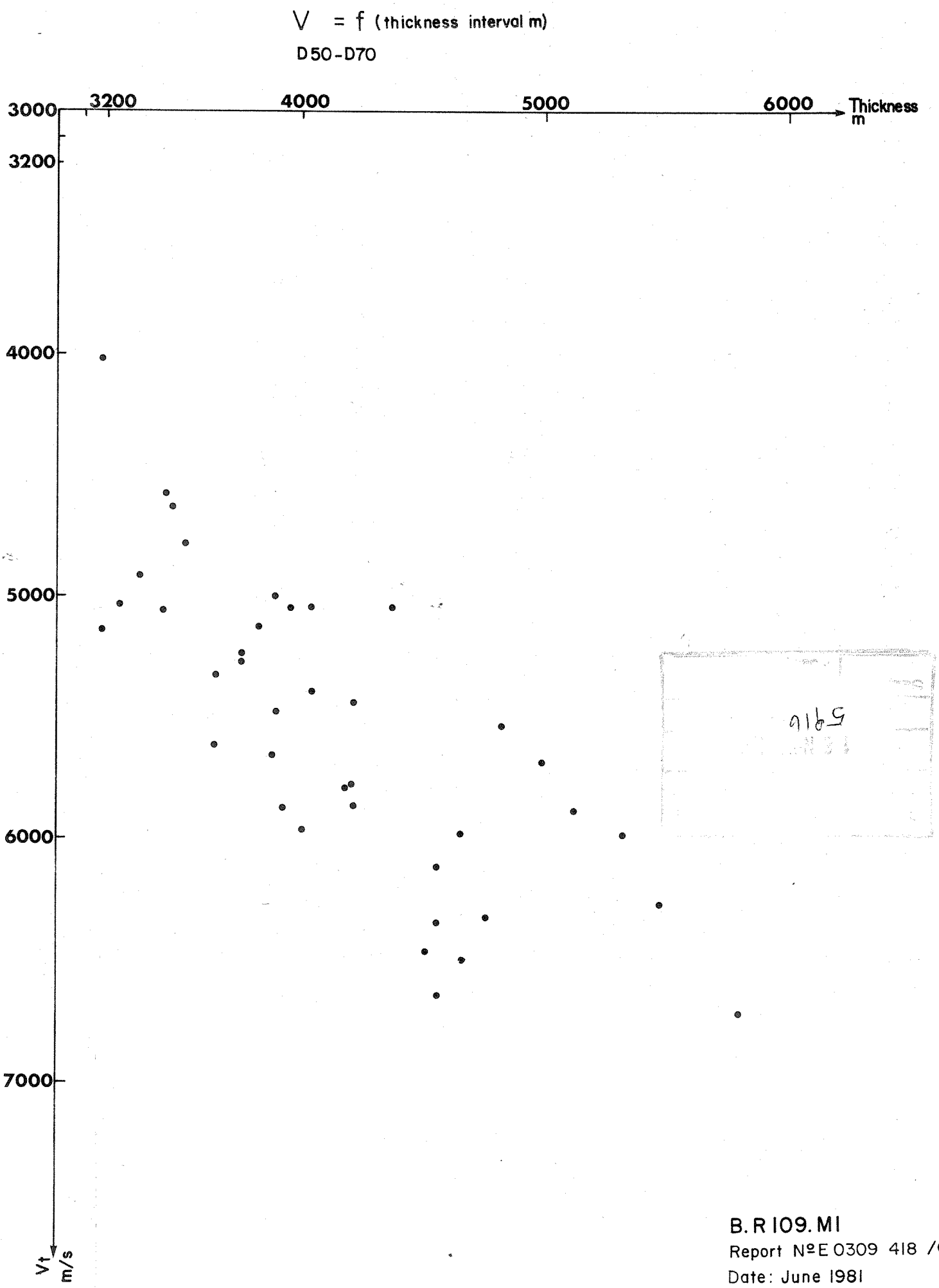

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fig. 3

LINE BR109-80-08

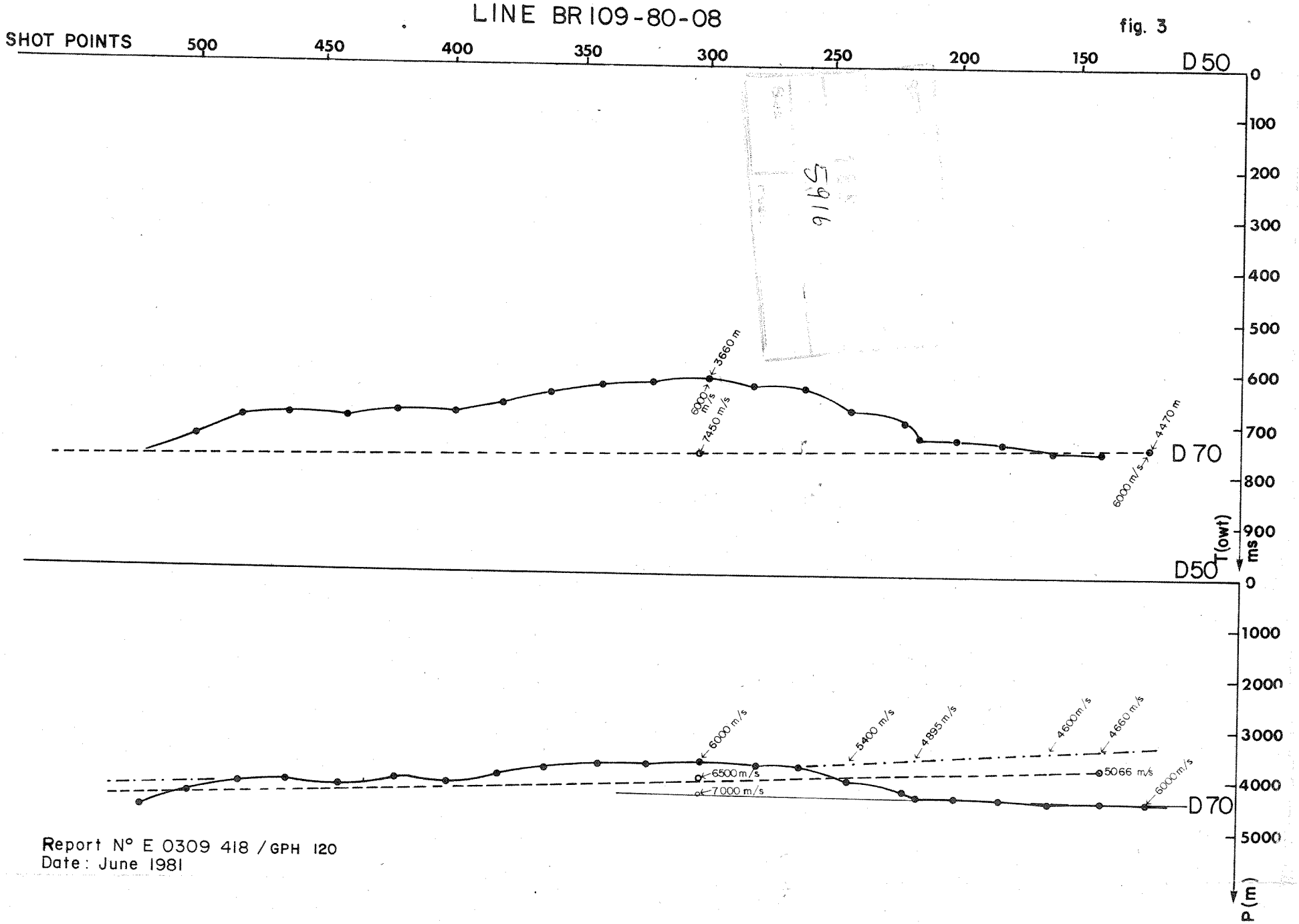

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fig. 4

LINE BR 109-80-08

DEPTH SECTION

horizontal scale: 1:50,000

SHOT POINTS 760 700 650 600 550 500 450 400 350 300 250 200 150 100 50 0

D 50

D 70

V(D50–D70) = 6000 m/s

D 70

As per extrapolared velocity law of G.E.M. I
(taking into accaunt the interval velocities computed from stack velocities)

1000
2000
3000
4000
5000
6000
7000
8000
P (m)

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LINE BR 109-80-09
DEPTH SECTION

fig. 5

SHOT POINTS 1 50 100 150 200 250 300 350 400 450 500 550 600 625 650 700 750 800 830

horizontal scale: 1:50,000

PROJECT

0 1000 2000 3000 4000 5000 6000 7000

P(m)

D 50

D 70

V(D50-D70) = 6000 m/s

D 70

As per extrapolared velocity law of G.E.M. I

(taking into accaunt the interval velocities computed from stack velocities)

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Horizons identification

FIG. 6

Line BR 80-109-09
(Migration temps)

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