

RHAETIAN (UPPER TRIASSIC) MARINE FAUNAS FROM «LE GOLFE DU LUXEMBOURG» IN BELGIUM (PRELIMINARY NOTE)

by C. J. DUFFIN (1), P. COUPATEZ (2), J. C. LEPAGE (3)
and G. WOUTERS (4)

RESUME. - Une liste détaillée de la faune marine du Rhétien de la gaume est donnée dans cette note.

ABSTRACT. - Cuttings have recently been made in Jurassic and Triassic strata in preparation for the building of the E9 motorway from Arlon to Liège.

The vertebrate faunas from the Rhaetian (Upper Triassic) sections in the motorway excavations close to Habay-la-Vieille (Figs. 0-3), Belg. Geol. Survey sheet 218, Tintigny-Etalle, comprise isolated teeth, scales, vertebrae and fin spines of hybodont, ctenacanth and neoselachian sharks, teeth, scales and bones of palaeoniscid and sub-holostean actinopterygians and reptiles. The fragments are mostly moderately to well preserved; apart from a few palatal fragments, all of the actinopterygian teeth are detached from the jaws; the sharks teeth comprise mostly isolated crowns.

Four main levels in the Rhaetian sequence have been sampled by G. WOUTERS, P. COUPATEZ and J. C. LEPAGE since 1980 for fossil vertebrates. These horizons are given the following abbreviations for convenience (listed in ascending order through the sequence) : HLV 3 (basal to the Rhaetic black sands and marls, overlying the dolomitic sandstones of the Keuper), S 1, S 3, UDK 1 (lying many meters beneath Hettangian limestones). The species identified to date for each of these horizons is given as a provisional list in Table 1.

The bulk of the species recorded are well established from other sites in north west Europe, particularly in Britain (SYKES, CARGILL & FRYER, 1970; DUFFIN 1980), France (CORROY, 1928), Germany (E. von HUENE, 1933), Poland (DUFFIN & GAZDZICKI, 1977) and Switzerland (SCHALCH & PEYER, 1919; PEYER, 1944). Some of the selachian species have a more restricted record and their discovery in the Belgian Rhaetian is important in extending biogeographical ranges and in providing additional study material for poorly known taxa.

The Belgian material is particularly important with regard to the following species : *Pseudodalatias barnstonensis* (SYKES, 1971), *Vallisia coppi* (DUFFIN, 1982), *Polyacrodus* sp. nov. and *Hybodus* sp. nov. *Pseudodalatias* is otherwise known only from the British Penarth Group (Rhaetic), and the Riva di Solto Shales (Norian to Rhaetian) of Italy. The teeth of this genus are particularly interesting since their morphology suggests that they belong to the earliest known squalomorphic shark, but the ultrastructure of their enameloid is unique (REIF, 1978) and recalls that of hybodonts. *Vallisia* has been recorded only from the west of England, and may be an early batoid (DUFFIN, 1982). Two as yet undescribed new species of *Polyacrodus* and one new species of *Hybodus* are present in the Belgian faunas, but are also known from the Rhaetian of Britain, Germany and Switzerland (DUFFIN, 1980). The selachian dermal denticles present in the Belgian samples include hybodontid, ctenacanthid and placoid scales, together with at least four new scale types which are also known from the British Rhaetian (DUFFIN, 1980).

The rich selachian and actinopterygian fauna and the poor representation of

- (1) 126 Central Road, Morden, Surrey, SM4 5RL (England)
- (2) 29 avenue Dailly, B-1030 Bruxelles (Belgium)
- (3) Centre de Recherches 5 rue de Bar B-6767 Ethe (Belgium)
- (4) 230 Chaussée de la Hulpe B-1170 Bruxelles (Belgium)

terrestrial vertebrates suggests that the vertebrate bearing deposits in the site were marine with terrestrial influence. In other areas of north west Europe, possible brackish water and terrestrial components are represented in the Upper Triassic bone bed deposits. The following vertebrates, known from other European sites, have not been identified in the Belgian fauna yet : Dipnoi - *Ceratodus* sp., Selachii - *Palaeospinax*, *Raineria*; Holocephali - *Agkistracanthus*; Placodontia - *Psephoderma*, *Placochelyanus*; Archosauria - *Rysosteus*.

Mammals and mammal-like reptiles have previously been recorded from the Rhaetian of northern France (RUSSEL & WOUTERS, 1976), Luxembourg (WOUTERS, LEPAGE & COUPATEZ, 1983), Germany (E. von HUENE, 1933) and Switzerland (PEYER, 1956). The accompanying vertebrate faunas in these areas all contain well established Norian-Rhaetian fish remains. A detailed comparison of these faunas, together with a full description of the vertebrates from Habay-la-Vieille, will be given elsewhere (DUFFIN, in preparation).

ACKNOWLEDGEMENTS.

The authors would like to thank Mrs SIGOGNEAU-RUSSEL and Mr. D. RUSSEL for their encouragement and collaboration in the project.

We also would like to thank field surveyors, Mr. VERDONGEN and Mr. VERJANS, as well as the management of Roger DELBRASSINE Company, who kindly gave us access to the highway construction sites.

Our thanks also go to MM. G. E. QUINET, R. NOEL and J. HERMAN, for their helpful advice in the realisation of this booklet as well as to Mr. HULOT, the Director of the Ethe Department of the Belgian Institute of Research in Natural Sciences, for the excellent welcome we received.

REFERENCES.

- CORROY, G. (1928) - Les vertébrés du Trias de Lorraine et le Trias lorrain. *Ann. Paléont.*, 17 (3), 81-136, figs. 16-19, pls. 10-14, Paris.
- DUFFIN, C. J. (1980) - Marine vertebrates from the North West European Rhaetic (Upper Triassic). 326 pp. *Unpublished Ph. D. thesis, London University.*
- DUFFIN, C. J. (1982) - Teeth of a new selachian from the Upper Triassic of England. *N. Jb. Geol. Paläont. Mh.* 1982 (3), 156-166, 4 figs., 1 tab., Stuttgart.
- DUFFIN, C. J. & GAŹDZICKI, A. (1977) - Rhaetian fish remains from the Tatra Mountains. *Acta geol. Pol.*, 27 (3), 333-348, 10 figs., 2 pls., Warsaw.
- PEYER, B. (1944) - Über Wirbeltierfunde aus dem Rhät von Hallau. *Eclogae geol. Helv.*, 36 (2), 260-263. Basel.
- PEYER, B. (1956) - Über Zähne von Haramiyiden, von Triconodonten und von wahrscheinlich synapsiden Reptilien aus dem Rhät von Hallau, Kt. Schaffhausen, Schweiz. *Schweiz. paläont. Abh.*, 72, 1-72, Basel.
- REIF, W. E. (1978a) - Tooth enameloid as a taxonomic criterion 2. Is "*Dalatias*" barnstonensis SYKES, 1971 (Triassic, England) a squalomorphic shark? *N. Jb. Geol. Paläont. Mh.* 1978 (1), 42-58. Stuttgart.
- REIF, W. E. (1978b) - Types of morphogenesis of the dermal skeleton in fossil sharks. *Paläont. Z.* 52, 110-128. Stuttgart.
- RUSSELL, D. & WOUTERS, G. (1976) - Une dent d'aspect mammalien en provenance du Rhétien français. *Geobios*, 9 (4), 377-392. Lyon.
- SCHALCH, F. & PEYER, B. (1919) - Über ein neues Rhätvorkommen im Keuper des Donau-Rheinzuges. *Mitt. d. Bad. Geol. Landesanstalt VIII*, 2, 110-116.
- SYKES, J. H., CARGILL, J. S. & FRYER, H. G. (1970) - The stratigraphy and palaeontology of the Rhaetic Beds (Rhaetian : Upper Triassic) of Barnstone, Nottinghamshire. *Mercian Geol.*, 3 (3), 233-264, 5 figs., pls. 15-18. Nottingham.
- von HUENE, E. (1933) - Zur Kenntnis des Württembergischen Rhätbonebeds mit Zähnfunden neuer Säuger und säugerzahnlicher Reptilien. *Jh. Ver. vaterl. Naturk. Württ.*, 65-128. Stuttgart.
- WOUTERS, G., LEPAGE, J. C. & COUPATEZ, P. (1983) - Note préliminaire sur des dents d'aspect thérapside du Keuper supérieur du Grand-Duché de Luxembourg. *Bull. Soc. belge Géol.* 92 (1), 63-64. Brussels.

Manuscrit déposé le
22 septembre 1983.

TABLE 1 - PROVISIONAL SPECIES LIST AND DISTRIBUTION OF FOSSIL VERTEBRATES IN THE MOTORWAY SECTIONS AT HABAY-LA-VIELLE, BELGIUM.

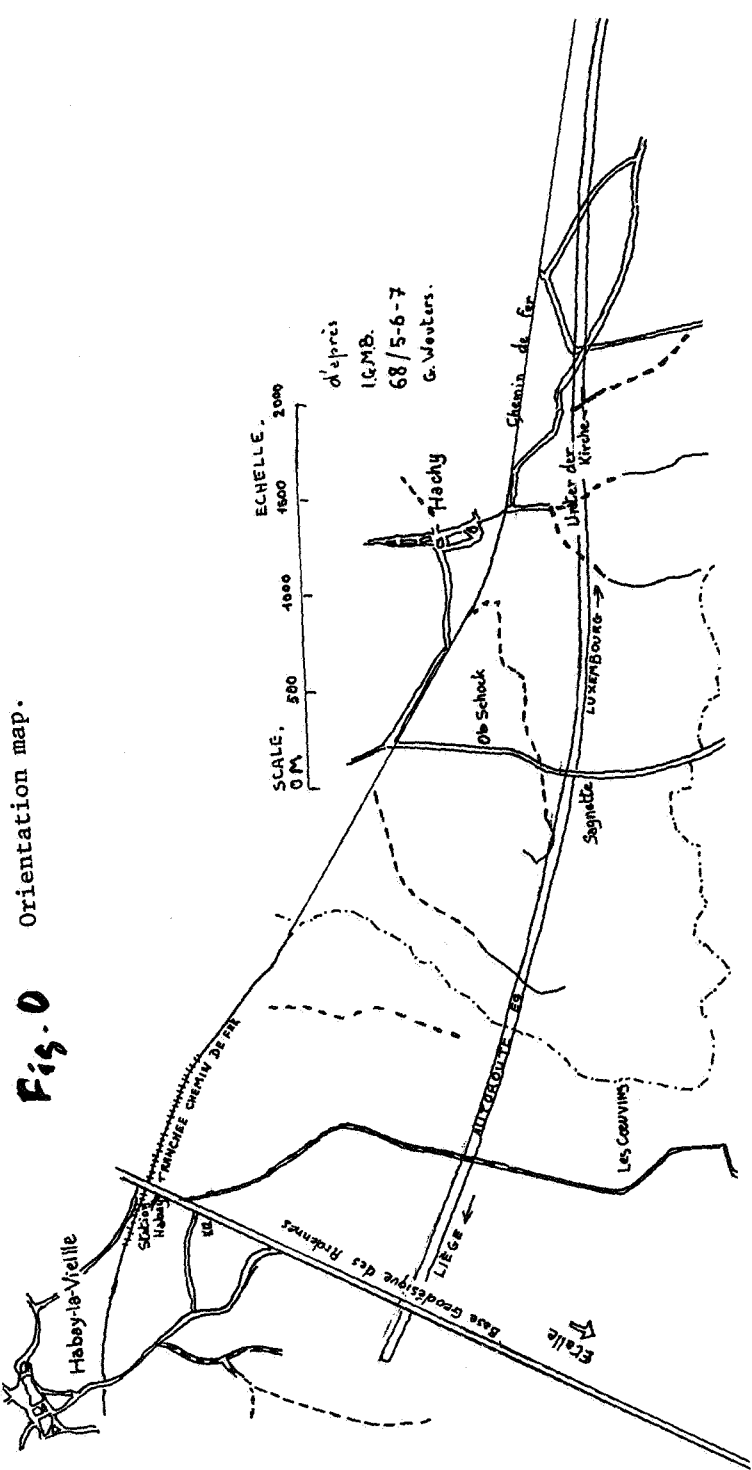
HLV 5, S 1, S 3 and UDK 1 are horizons in ascending order through the Rhaetian (Upper Triassic) sequence.

+ indicates species present.

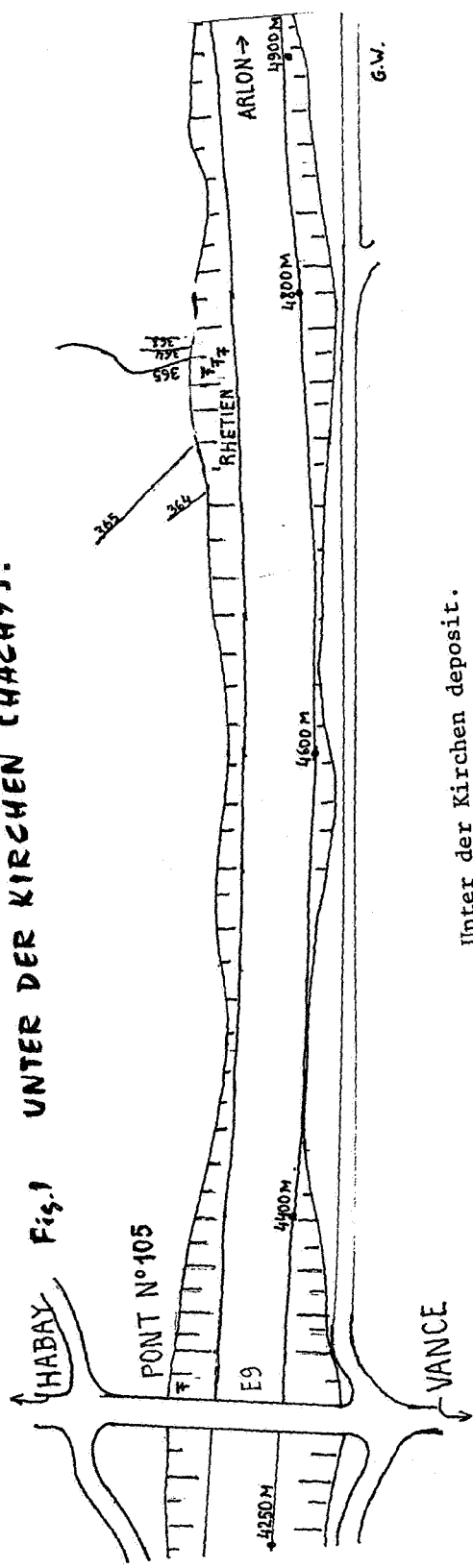
LOCALITY : HLV = Habay-la-Vieille
S = Sagnette (Hachy)
UDK = Unter der Kirchen (Hachy)

SPECIES	HORIZON	HLV 5	S 1	S 3	UDK 1
<i>Selachii</i>					
Hybodontiformes					
<i>Acrodus minimus</i> AGASSIZ		+	+	+	+
<i>Hybodus minor</i> AGASSIZ		+	+	+	+
<i>Hybodus</i> sp. nov.				+	+
<i>Polyacrodus cloacinus</i> (QUENSTEDT)		+	+	+	?
<i>Polyacrodus</i> sp. nov. 1			+	+	+
<i>Polyacrodus</i> sp. nov. 2			+	+	+
fin spine fragments		+		+	
scales		+	+	+	+
Neoselachiformes					
<i>Pseudodalatias barnstonensis</i> (SYKES)		+	+	+	
<i>Nemacanthus monilifer</i> AGASSIZ		+		+	
<i>Vallsia coppi</i> DUFFIN					+
calcified vertebrae			+	+	+
Indeterminate selachians					
placoid scales		+	+	+	
ctenacanthid scales		+	+	+	+
other scales (4 types)		+	+	+	+
<i>Actinopterygii</i>					
Palaeonisciformes					
<i>Birgeria acuminata</i> (AGASSIZ)		+	+	+	+
<i>Saurichthys longidens</i> AGASSIZ		+	+	+	+
<i>Gyrolepis albertii</i> AGASSIZ		+		+	+
sub-Holostei					
<i>Sargodon tomicus</i> PLIENINGER		+	+	+	+
<i>Colobodus</i> sp.			+	+	+
Indeterminate teeth		+	+	+	+
Indeterminate scales		+			
bones and vertebrae				+	+
<i>Reptilia</i>					
<i>Miosauria</i> ? sp.				?	
<i>Ichthyosaurus</i> sp.		+			
<i>Plesiosaurus</i> sp.			+	+	
Prosauropods sp.		?	+	+	
Indeterminate reptilia		+	+	+	+
Indeterminate coprolites		+	+	+	+
<i>Mammalia</i>					
<i>Haramiyidae</i>					
Indeterminate mammalia					

Orientation map.

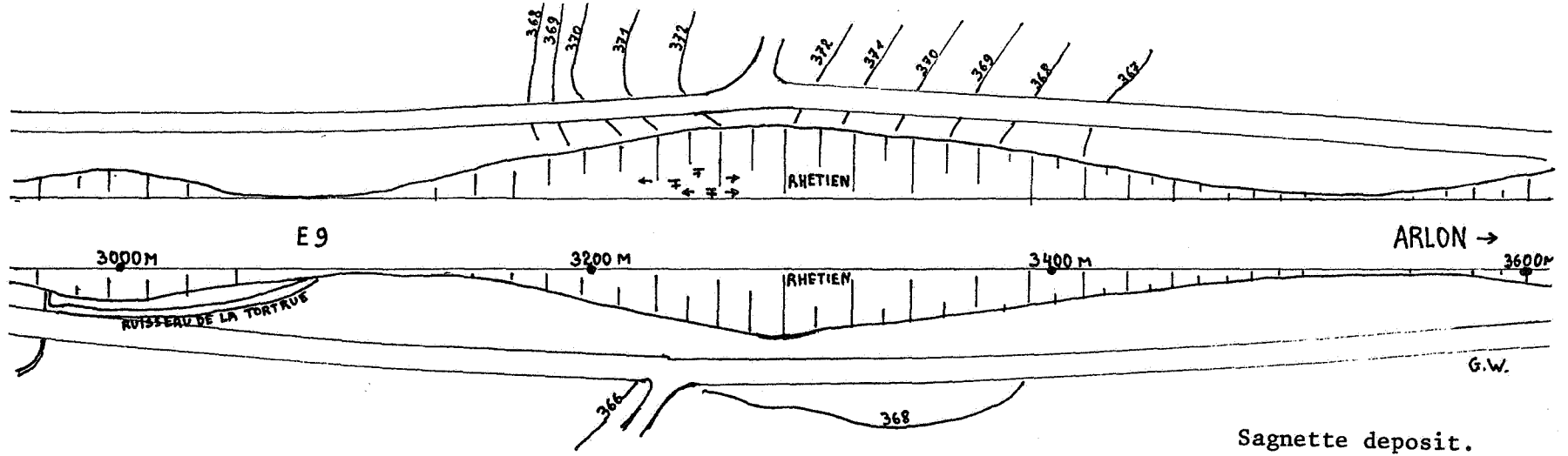


UNTER DER KIRCHEN (HACHY).



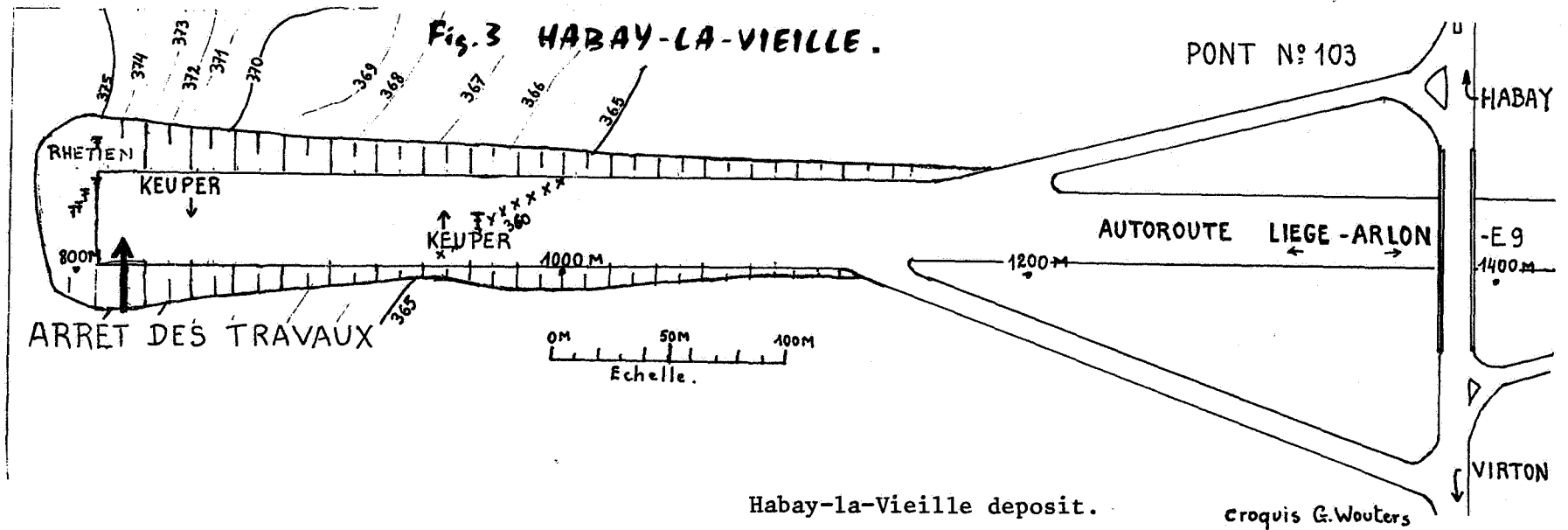
Unter der Kirchen deposit.

Fig.2 SAGNETTE (HACHY)



315

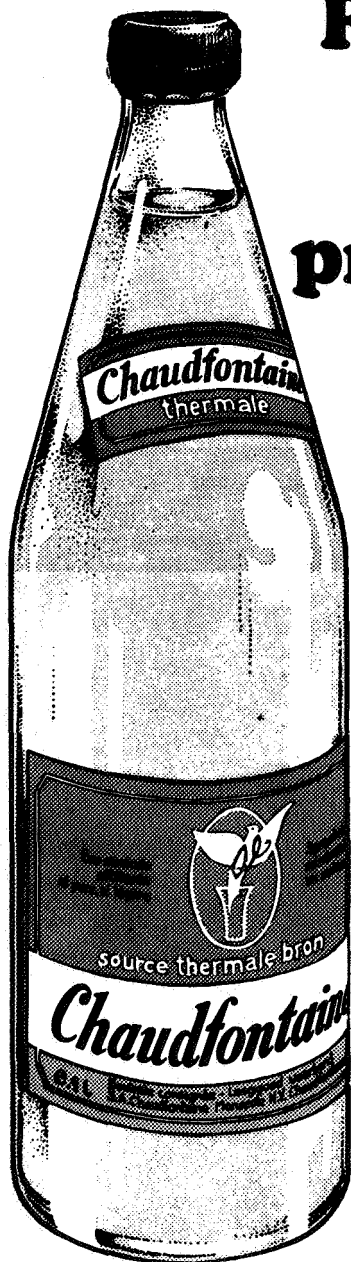
Fig.3 HABAY-LA-VIEILLE.



Habay-la-Vieille deposit.

Chaudfontaine

Retrouvez la pureté des profondeurs



Dans les profondeurs inexplorées de la terre, protégée contre toutes formes de pollution, naît une eau très pure, absolument intacte.

En remontant vers l'air libre, à travers roches et cristaux, elle acquiert juste ce qu'il lui faut pour être une eau bien équilibrée : ni trop, ni trop peu d'éléments minéraux.

Et elle jaillit. Intacte, vraie, légère. Cette eau c'est Chaudfontaine !

Une eau agréable au goût, équilibrée et pure, qui aide à éliminer les excès.

Tout le monde peut en faire, sans aucune contre-indication, son eau de chaque jour.

**Chaudfontaine,
l'eau intacte**