the shallower block have not brought any results which should justify an essential change of the earlier opinion on the structural setting. This means that germanotype tectonic elements, sometimes and under specific circumstances accompanied by Carpathian activization, are considered chief deposit-forming elements. The structural-tectonic model shown in a structural map of the crystalline basement (Fig. 3) and a geological cross-section (No. 183, Fig. 7) is conceived in this way as well.

Objective problems arise when interpreting depths of the platform foundation and its geological composition. This mainly results from insufficient data and variable-quality seismic measurements.

Consequently, an alternative approach to the study of the western marginal zone of the Vienna Basin has been selected. Both variants include a delineation of basic structural and tectonic elements with the distinctive elevation bulge between Lednice and Podivín. This region presently seems to be best prepared for verification by drilling. However, there are still problems to be solved, namely those of the basic deep setting of the structure, of its tectonic position and preservation of promising hydrocarbon accumulations. Another alternative is offered by F. Chmelík (1985) who assumes lower depths of the platform units.

One way or another, the beginning of the exploration of the structural region in the vicinity of Lednice marks the beginning of an economically and technically very demanding project. Consequently, considerable attention must be paid to its preparatory stage, i. e. to the implementation of most progressive seismic measurements and their evaluation. On the other hand, the extent of structures of this type suggests that such projects are very important for the national economy. In this respect, close cooperation with our Austrian colleagues is extremely important, in the framework of which the areas of interest are being extensively explored. In these terms, the results achieved so far in both countries draw from the long-term and qualified cooperation.

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Abstrakt

V předloženém článku je hodnocena perspektivita vysoce pokleslých jv. svahů Českého masívu v prostoru západního okraje vídeňské pánve. Na základě zhodnocení geologických a geofyzikálních podkladů byla v prostoru Lednice vymezena rozsáhlá elevační struktura autochtonních útvarů vázaná na výraznou zlomovou linii S—J směru. Zahájení průzkumných prací v oblasti Lednice bude úkol z hlediska ekonomického i technického velmi náročný, na druhé straně však rozsah struktur tohoto typu naznačuje značný národohospodářský význam. Z tohoto pohledu má značný význam spolupráce s rakouskými geology, v rámci které dochází k široce pojatému plošnému zpracování oblasti.

Zusammenfassung

Im vorliegenden Beitrag wird die mögliche Erdölhöffigkeit tief eingesunkener SO-Hänge der Böhmischen Masse im Raum des Westrandes des Wiener Beckens eingeschätzt. Aufgrund einer Auswertung der geologischen und geophysikalischen Unterlagen wurde im Raum von Lednice eine ausgedehnte Elevationsstruktur aus autochthonen Gesteinskomplexen abgegrenzt, die an eine von N nach S streichende, ausgeprägte Bruchlinie gebunden ist. Die Aufnahme der Erkundungsarbeiten im Gebiet von Lednice wird eine in ökonomischer sowie technischer Hinsicht sehr anspruchsvolle Aufgabe sein, andererseits wird allerdings durch die Flächenausdehnung der Strukturen von diesem Typ ihre beträchtliche volkswirtschaftliche Bedeutung angedeutet. Von diesem Gesichtspunkt aus ist die auf eine breit aufgefaßte Flächenbearbeitung des Untersuchungsgebiets orientierte Zusammenarbeit mit österreichischen Geologen von ziemlich großer Bedeutung.

CZECHOSLOVAK-AUSTRIAN COOPERATION IN GEOPHYSICAL STRUCTURAL EXPLORATION IN THE VIENNA BASIN

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[1] Geofyzika, Brno, Czechoslovakia
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Under the long-term agreement on cooperation in geological sciences between Czechoslovakia and Austria a team was formed with the aim to upgrade prospection for hydrocarbons in the Czechoslovak and Austrian parts of the Vienna Basin. In order to solve particular geological and geophysical problems professional staff members from Geofyzika Brno and ÖMV Vienna met annually in Brno or Vienna. Predominantly seismic beside the other geophysical methods like gravity, log service and its substituted disciplines with regard to geological problems were discussed. Discussions concerning methodology of data acquisition, processing and interpretation obtained and demonstrated by the two parties in general and involving the border area in particular were very helpful.

Geophysical data and other materials from the Czechoslovak-Austrian border areas have been exchanged between Czechoslovak and Austrian geophysicists.

When the cooperation started in the sixties, the gravity potential field method had an essential meaning next to the seismic reflection method, especially concerning deep situated structures. At that time it was very difficult for the seismic measurement to solve the above mentioned problems without complex interpretation. Still single fold seismograms were used and the last good addressable horizon f. e. within the Vienna Basin has been the Aderklaa conglomerate. Only parts of weak reflection from the base Neogene could be used for the correlation of a phantom horizon.

In 1968 an agreement was prepared to connect the two independent gravity nets from ÖMV and Geofyzika Brno. At this point we remember Mr. Břetislav Beránek not only as a mentor in many technical discussions, but also for his assistance for this project.

The connection of the gravity net involved measurements on both sides of the border executed by ÖMV Geophysics and Geofyzika Brno in 1969—1974.

BOUGUER GRAVITY ANOMALY MAP VIENNA BASIN

$\sigma = 2{,}67\,g\,cm^3$

V. Čekan, J. Ibrmajer, Geofyzika Brno
D. Zych, ÖMV Vienna

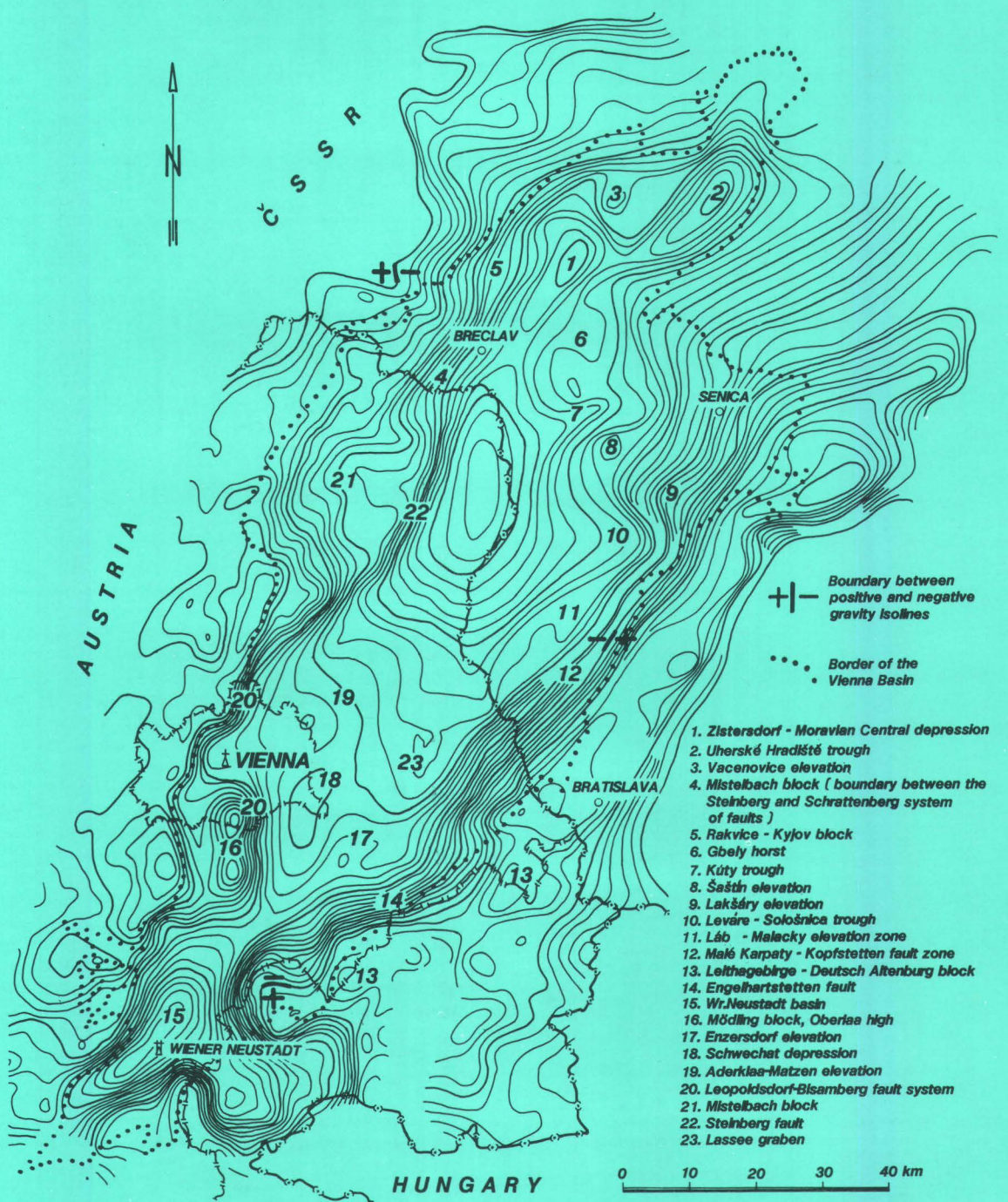


Fig. 1

STRUCTURAL MAP OF THE VIENNA BASIN ON THE SURFACE OF THE PANNONIAN-SARMATIAN

state in 1988

Authors:

J.Hromec
A.Kocák *GEOFYZIKA sp BRNO*
R.Jiříček et al MND HODONIN

H.Unterwelz et al ÖMV WIEN

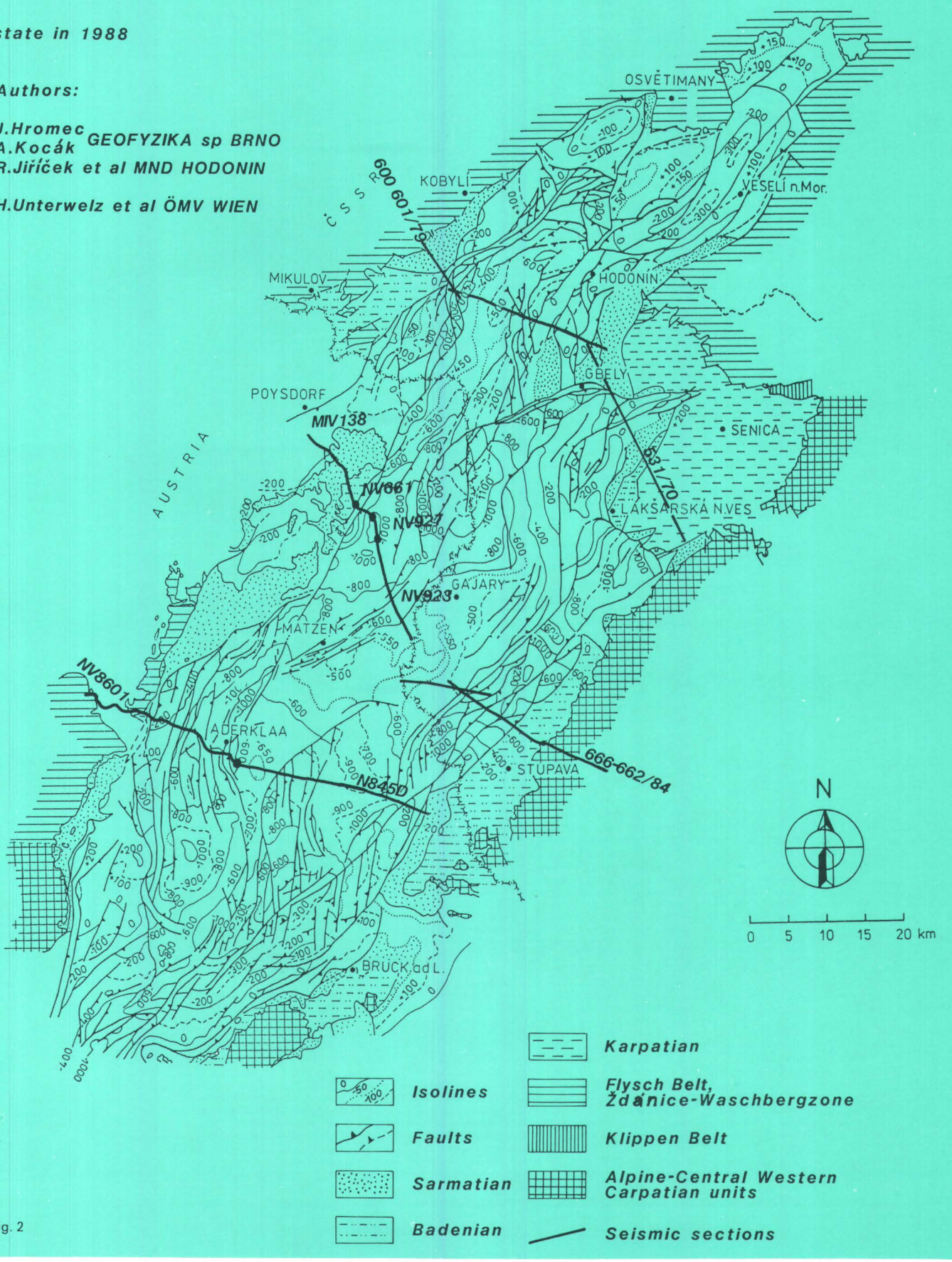
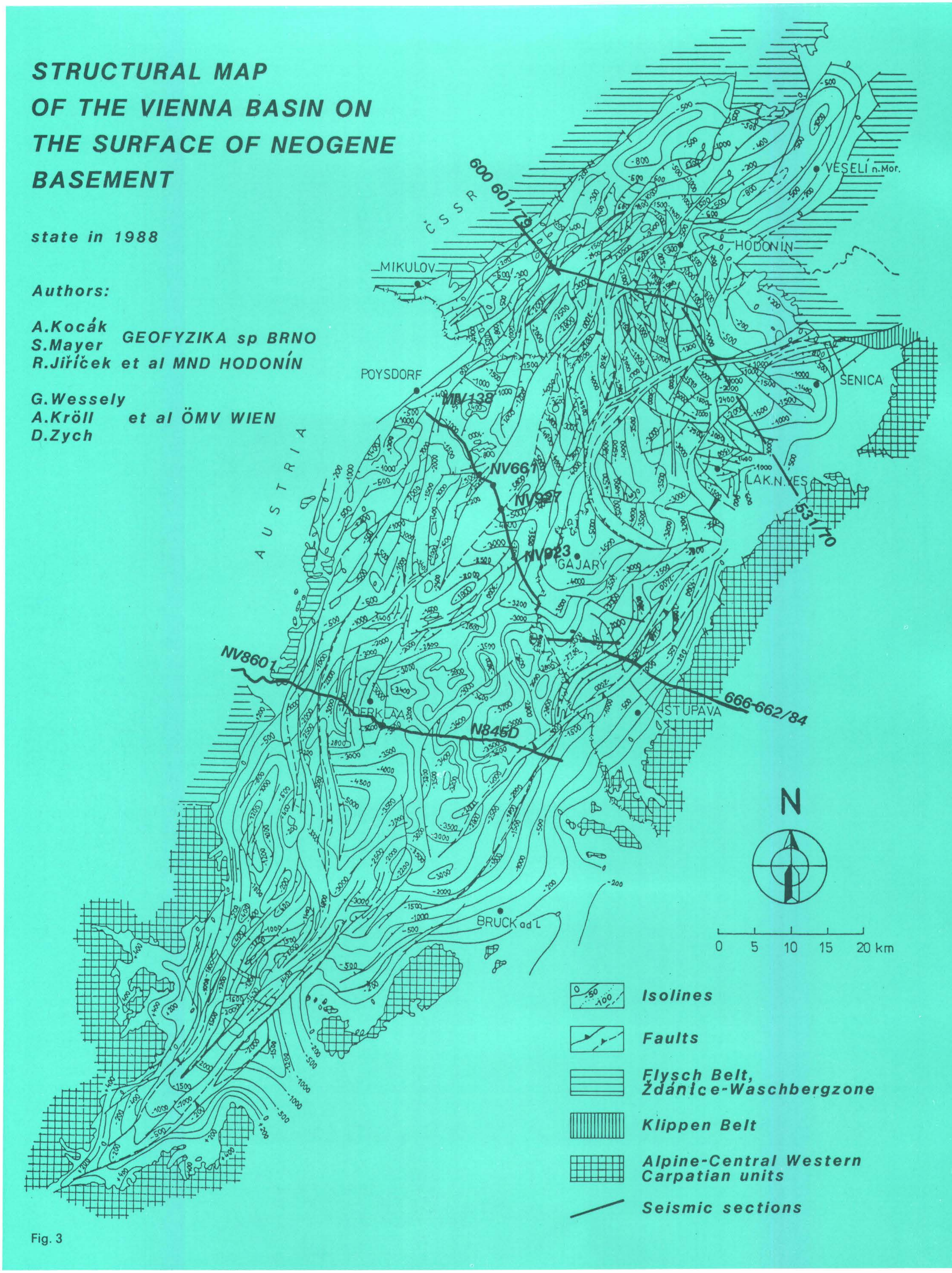


Fig. 2



STRUCTURAL MAP OF THE VIENNA BASIN ON THE SURFACE OF NEOGENE BASEMENT

state in 1988

Authors:

A.Kocák
S.Mayer GEOFYZIKA sp BRNO
R.Jiříček et al MND HODONÍN

G.Wessely
A.Kröll et al ÖMV WIEN
D.Zych

Fig. 3

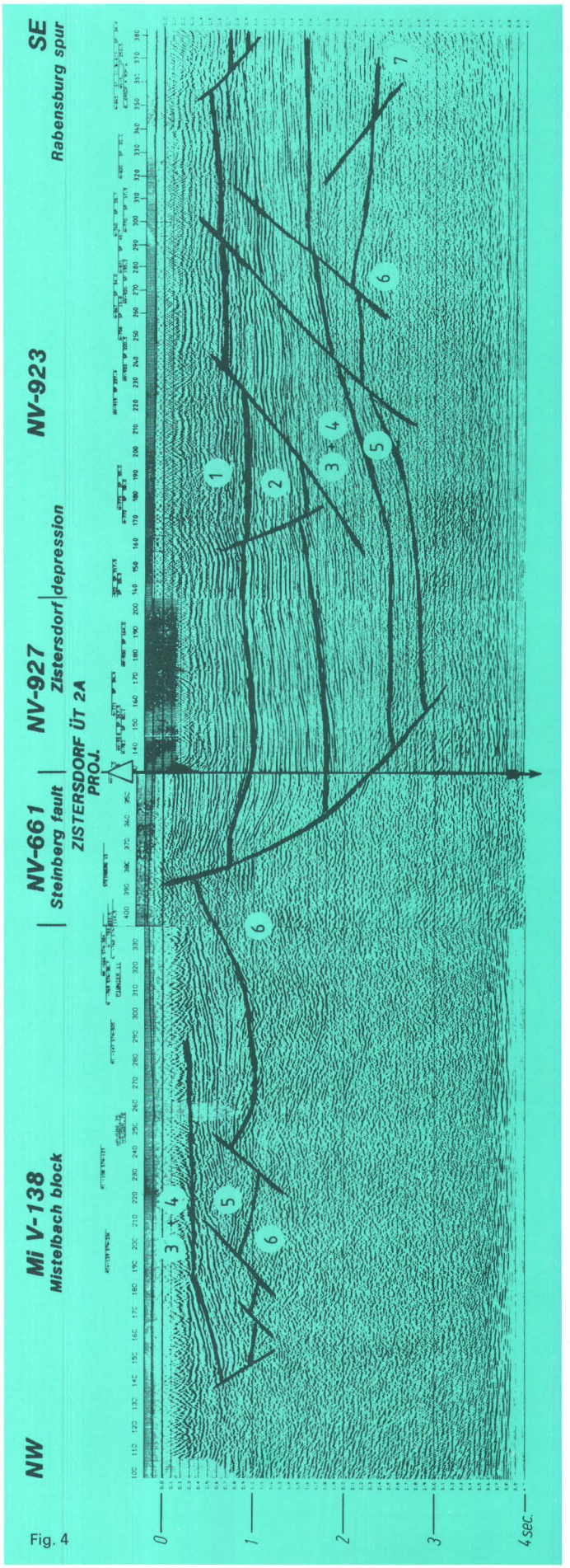


Fig. 4

Both institutions determined gravity differences at the base points of the Czechoslovak and Austrian gravimetric networks.

All the measured data were processed in Geofyzika Brno (Čekan and Odstrčil 1974). Relative differences of 12.1—14.8 μ s^{-} were detected between the basic networks. A constant correction of 13.0 μm s^{-} was used for processing the data. A unified Bouguer anomaly map was constructed in a 6 km wide band along the border, from which residual maps (Saxov-Nygaard and Baranov s = 0,25 km) were derived. Detailed gravimetry has yielded a comprehensive pattern of geologic structures in the border areas, which stimulated the forthcoming geologic-geophysical activity. The joint correlation of gravimetric networks made it possible to construct Bouguer anomaly map for the whole basin. For the Czechoslovak part of the Vienna Basin the maps constructed by J. Ibrmajer (1978) and by Č. Tomek (1976) and for the Austrian part by D. Zych (1988) were used.

The gravity scheme shows depression-type of the structure of the NE-SW elongated basin, which is characterized by a central and adjoining minima. The basin is further divided by longitudinal and transversal elements into partitional structural units related to inhomogeneities in both the basin fill and its fundament. The striking gradients of the gravity field correspond with significant fault systems.

The following systems represent the marginal limitation of largest subsidence in the Vienna Basin:

In the NW near the towns of Poysdorf and Břeclav the Steinberg-Schrattenberg fault system can be observed.

Following this system to the SW the Steinberg fault and the Schrattenberg fault split apart. The directions and character of the Steinberg fault changes near Wolkersdorf and is replaced by other faults, especially the Bisamberg fault and the Leopoldsdorf fault system.

In the SE, along the Bruck-Senica line, the Kopfstetten-Engelhartstetten fault system bordering the Malé Karpaty- and Leithagebirgsblocks (Fig. 1) are indicated.

In the seventies the influence of the gravity method as a whole was nearly neglected in favour of the evolution in seismic field work and processing technics (E. Geutebrück et al., 1984).

Methodology and technology of CDP reflection seismic surveys have gradually improved, which has reflected adequately in the data output quality. Both dynamite and Vibroseis technologies have been applied along profiles (2D survey). Registration was accomplished with the use of 96 channel recording units and 40 fold coverage with the same frequency ranges for generating the waves and for their registration. The obtained seismic data enabled a mutual tie between the Czechoslovak and Austrian results and interpretation of structures along the border.

Numerical processing of seismic data has been performed in a conventional way. Both parties have used identical hardware. Their data processing systems have differed only in details. The Czechoslovak party has used the Geofyzika Brno system while the Austrian one the CGG system, which has resulted in differences in the wavefield patterns in the respective time sections. A greater (2 mm as compared with 1 mm used by the Czechoslovak party) interval of CDP traces along the Austrian profiles is responsible for a clearer course of seismic tracing maxima and minima. To a certain extent, though, overall dynamic character of time sections appears relatively worse. Disturbant waves that occur in some Czechoslovak time sections are well attenuated in Austrian time sections.

As a result of compilation of geophysical and borehole data a map of the Neogene basement topography and that of the Pannonian-Sarmation boundary was constructed in cooperation with the Austrian and Czechoslovak hydrocarbon exploration groups (A. Kröll, G. Wessely 1973, A. Kröll 1980, F. Němec, R. Jiříček, A. Kocák et al. 1983, G. Wessely 1984, A. Kocák, S. Mayer et al. 1986).

The contour maps (figs. 2 and 3) show a distinct system of structural elements as longitudinal fault systems (NE-SW) in some cases transversal ones (NW-SE) and often in en echelon arrangements, which delimit horsts, interblocks, troughs, as well as ridges, depressions and monoclines. The main structural elements and their terms were described in another paper (W. Hamilton, R. Jiříček, G. Wessely) in this volume.

Main elements are documented in several seismic sections crossing the northern Vienna Basin. The pair of sections 600—601/79 and 531/70 (Fig. 4) extending North of the state boundary passes from West to East the Rakvice block, the converging of the Schrattenberg-Steinberg fault systems, the Moravian Central depression, the Lanžhot-Lužice fault system, the Hodonín—Gbely horst, the Hodonín—Gbely faults, the Kopčany depression, the Holíč block area, the Štefanov elevation, the Farské fault system, the Kovalov depression. The second pair of sections MiV138—NV661—NV927—NV923, 666—662/84 combines the Lower Austrian and the Slovakian part of the Vienna Basin. The section crosses the Steinberg fault in the part of the largest displacement between the Mistelbach block (Steinberg high) and the Zistersdorf depression. Towards the border the submerging Rabensburg spur as the continuation of the Hodonín—Gbely spur is to be noticed, in Slovakia flanked by the Suchohrad trough. The Zohor-Plavecký Mikuláš graben is bordered to the West by the Láb faults and to the East by the Kopfstetten-Engelhartstetten fault system, the main faults separating the graben from the Malé Karpaty marginal block. The southernmost sections NV8601 ND845D show to the West the western margin of the basin, the Bisamberg fault, the Gross-Engersdorf depression, the Aderklaa en echelon fault system, the Aderklaa elevation, the Markgrafneusiedl faults, the Marchfeld depression, the Lasseegraben (corresponding to the Zohor-Plavecký Mikuláš graben) and the Kopfstetten Engelhartstetten fault system.

The data on depths in the pre-Neogene basement, subsidence and amplitudes of faults are obvious in the maps.

In order to make the seismic and geologic data in the proximity of the border more accurate both parties agreed to conduct a joint 3D seismic survey. The first joint 3D survey was conducted in 1987 in the area of 23.3 km² between the towns of Lanžhot and Rabensburg under very complicated field conditions. This is why an irregular 3D system

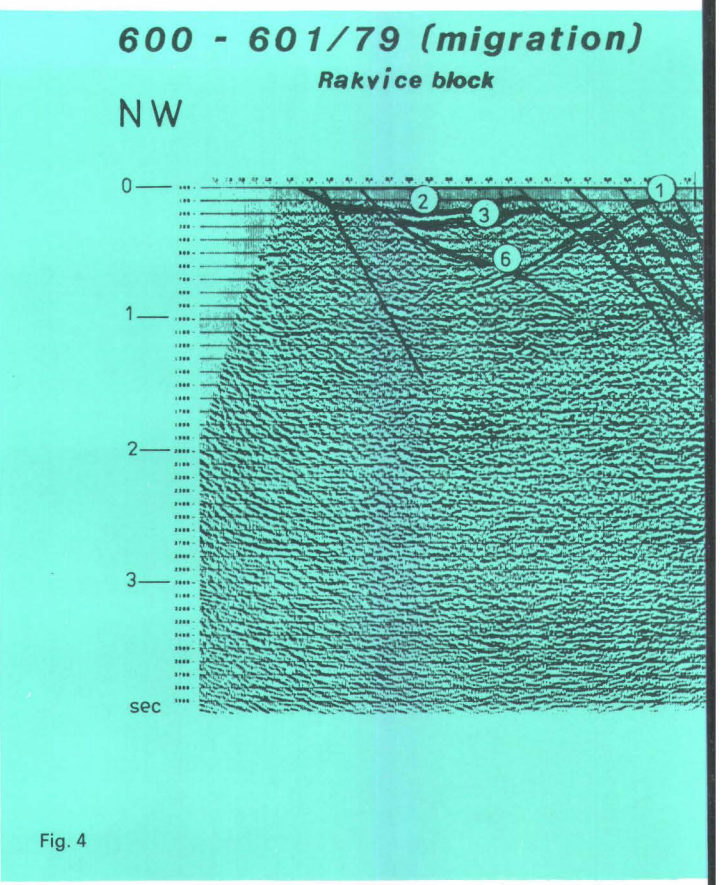


Fig. 4

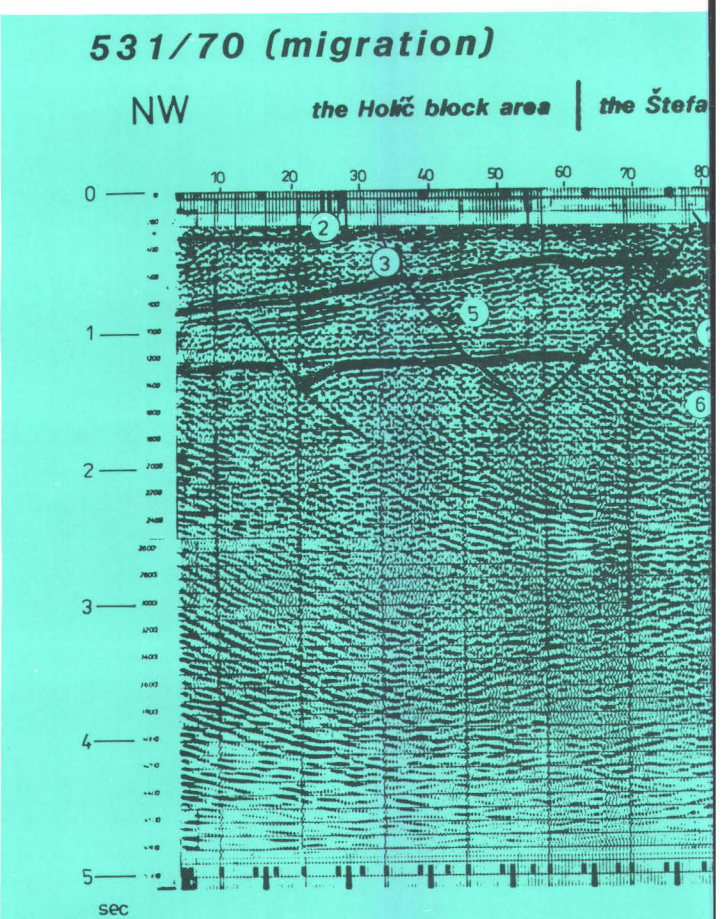
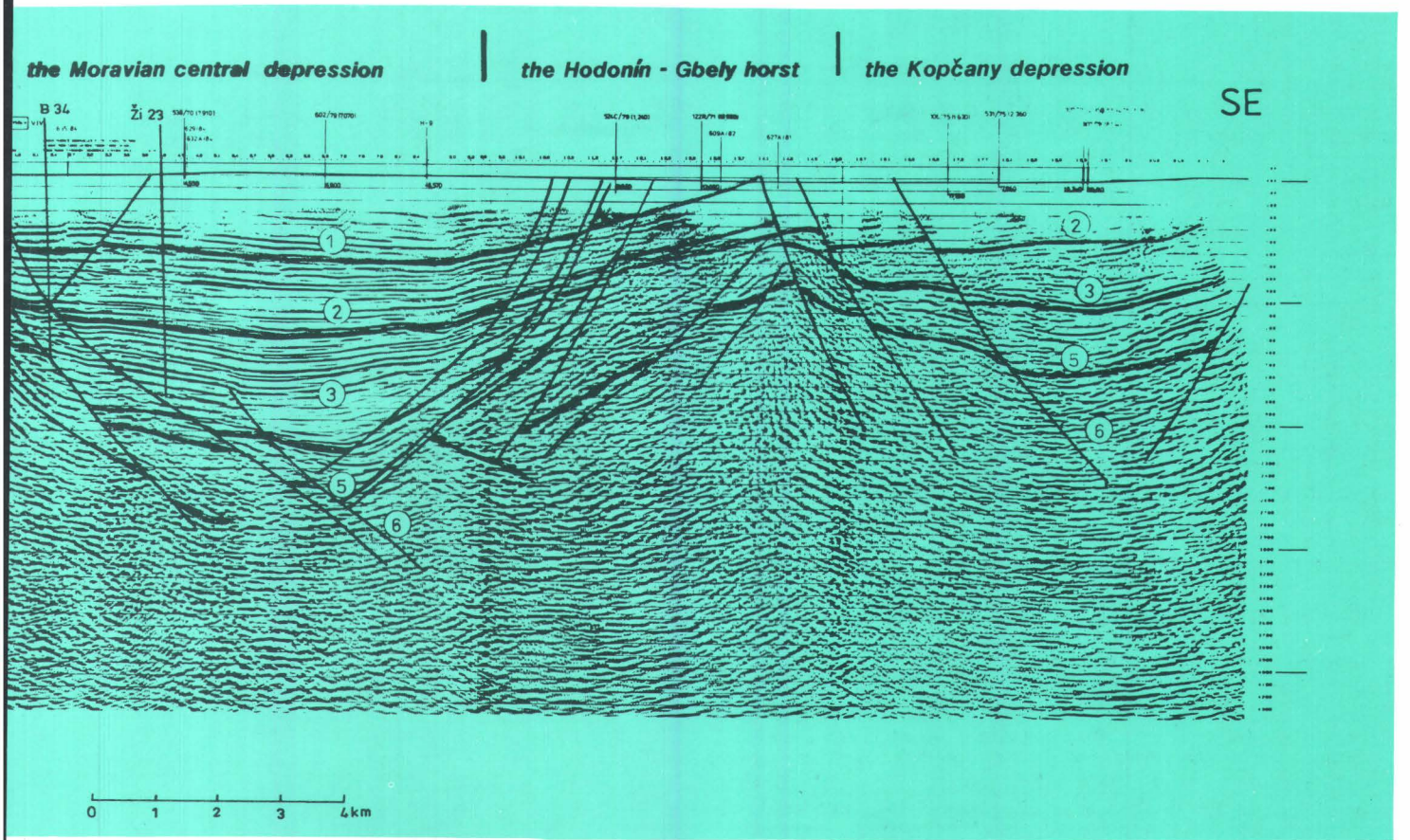
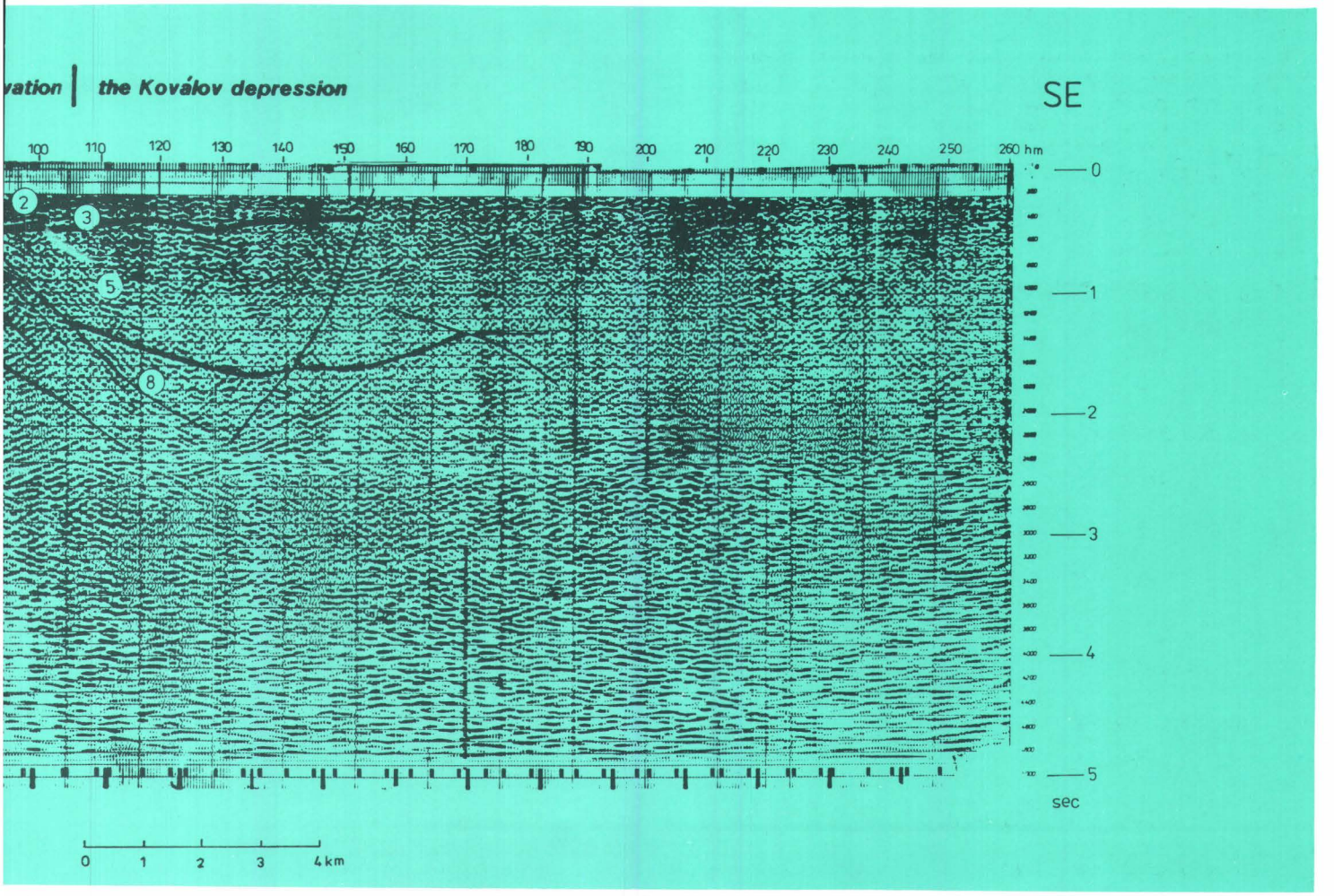


Fig. 4

LEGEND TO MIGRATED TIME SECTIONS

1. PANNONIAN - PLIOCENE
2. SARMATIAN
3. UPPER BADENIAN
4. LOWER BADENIAN
4a. ADERKLAA CONGLOMERATE
5. LOWER MIOCENE (KARPATIAN - EGGENBURGIAN)
6. FLYSCH BELT
7. KLIPPEN BELT
8. INTERNAL ALPINE - CARPATHIAN UNITS
9. MOLASSE
10. AUTOCHTHONOUS MESOZOIC
11. CRYSTALLINE BASEMENT


the Moravian central depression
the Hodonín - Gbely horst
the Kopčany depression
SE
B 34
Ži 23
1
2
3
5
6
0 1 2 3 4km


vation
the Koválov depression
SE
100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 hm
2
3
5
8
0
1
2
3
4
5
sec
0 1 2 3 4km

was used along with the dynamite technology.

To carry along this survey a detailed preplaning with a team of specialists from both sides was necessary. The simulation of shot point location and layout was prepared by the Austrian geophysicists with their experience obtained in preceeding 3D-campagnes, the technical department of Geofyzika Brno performed the preparation and execution or the radio communication between the two crews.

Both parties had 192 recording channels available which makes 384 channels altogether. The size of reflection elements was 30 × 30 m. On average, 6—8 fold coverage was attained. The seismic data were processed by the Austrian party on the system GEOMAX 2.

Seismic sections and time slice sections were processed for interpretation to prepare a detailed map of this area.

The joint geophysical activities in general contributed largely to the geologic information in the border areas and are useful tools for further exploration.

Abstrakt

Tento příspěvek podává souhrnný přehled o spolupráci státního podniku Geofyzika, Brno, a ÖMV, akc. spol., Vídeň, v oboru geofyziky. Tato činnost je součástí dohody o spolupráci v geologických vědách mezi Československem a Rakouskem.

Předmětem zájmu byla společná gravimetrická a seizmická měření, jakož i výměna geologicko-geofyzikálních poznatků a materiálů z pohraničních oblastí. Korelace gravimetrických sítí umožnila získat detailní výsledky měření lokálního gravitačního pole v pohraničních oblastech a sestavit mapu Bouguerových anomálií celé pánve. Seizmická měření byla kompilována a umožnila tak zhotovení strukturních schémat celé pánve. V rámci spolupráce se v po-

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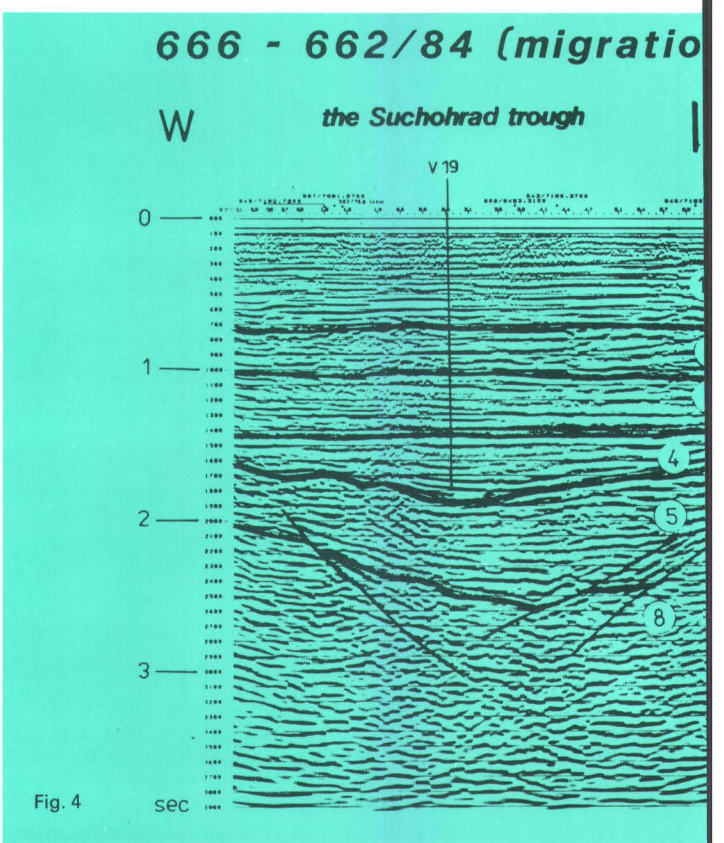

Fig. 4

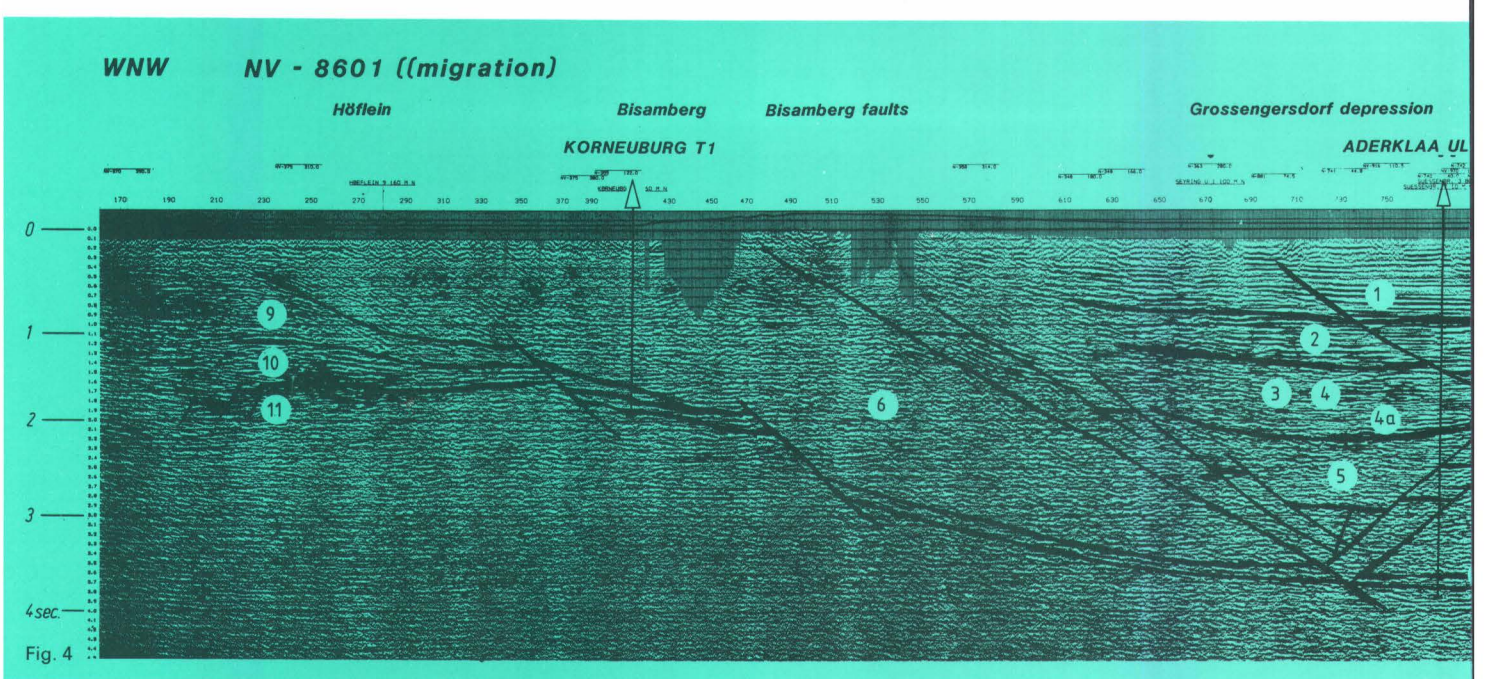

Fig. 4

slední době konala společná měření v okolí Lanžhota — Rabensburgu, kde bylo použito trojrozměrné seizmiky.

Zusammenfassung

Dieser Beitrag gibt eine zusammenfassende Übersicht über die Zusammenarbeit des Staatsbetriebes Geofyzika Brno und der ÖMV Aktiengesellschaft Wien in geophysikalischer Hinsicht. Diese Tätigkeit ist ein Bestandteil des Abkommens über die Zusammenarbeit in den geologischen Wissenschaften zwischen der Tschechoslowakei und Österreich.

Gegenstand des Interesses waren gemeinsame gravimetrische und seismische Messungen und der Austausch der geologisch-geophysikalischen Erkenntnisse und Materialien aus den Grenzgebieten. Die Korrelation der gravimetrischen Netze hat ermöglicht, die Detailergebnisse des Lokalschwerefeldes in den Grenzgebieten zu gewinnen und eine Karte der Bouguer-Anomalien des ganzen Beckens herzustellen. Die seismischen Messungen wurden kompiliert und haben so die Herstellung von Strukturschemen des ganzen Beckens ermöglicht. Im Rahmen der Zusammenarbeit erfolgten in letzter Zeit gemeinsame Messungen in der Umgebung von Lanžhot — Rabensburg, wo 3D-Seismik angewendet wurde.