

THE CONTRIBUTION OF THE CZECHOSLOVAK GEOLOGISTS TO THE GEOLOGY OF IRAQ

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The first Czechoslovak geologists came to Iraq at the invitation of SOM (State Organization for Minerals, now Iraq Geological Survey, GEOSURV) in the early or the mid 1960s and were recruited and sent there through Polytechna Praha, a state foreign trade company. The most well known expert, who worked at SOM, was Dr. Tibor Buday (TB) who started in the autumn of 1968. TB was commissioned to study especially the regional geology of the country, and focused mainly on oil-bearing areas, in addition to the mountains and their foothills in Kurdistan. After a few years he was able to compile a geological map of Iraq, and to write a book "The regional geology of Iraq". Vol.1 (1980). In 1984, he completed, along with Dr. Saad Jassim a geological and tectonic map of Iraq 1: 1000 000, and in 1987 they published "The Regional Geology of Iraq, Vol.2 Tectonism, Magmatism and Metamorphism".

Then during the 1970s and 1980s many Czech, and to much lesser extent Slovak geologists gradually worked at SOM. Their professional experience covered a range of fields of earth sciences such as geology, mineralogy, petrology, geochemistry, economic geology, sedimentology, metamorphic, igneous, volcanic petrology and geology, Quaternary geology, remote sensing, geophysics and other fields. They have gradually become experts on the geology of Iraq, and trained a number of Iraqi geologists.

Based on the good experience with the Czech geologists, especially with TB, the management of SOM decided to ask the Czech party to organize a geological expedition, which would have a task of geological mapping in the mountains of Kurdistan. Dr. Buday was appointed to design the project. He has chosen a few other geologists to join him in preparing the expedition, but before doing so they made a reconnaissance trip to Kurdistan in the autumn of 1975, and then compiled a mapping project. The project was later approved by both the Czech and the Iraqi parts, and the expedition started in the spring of 1976. In Prague, the expedition was provided with necessary material and equipment such as tents, clothes, geological equipment, etc. A preparatory team visited Kuwait and bought cars and other equipment. Finally, the first members of the expedition arrived in Baghdad in April 16, 1976 followed by another group a week or two later.

MAPPING IN KURDISTAN

The field mapping lasted six months-from April to October 1976. Dr. Buday was appointed the project manager and his deputy was Dr. Joel Pokorný. In addition to geologists there were a physician, cartographer and an administrator. A total of 26 people were in the project team. Dr. Buday, prior to regular field operations, acquainted the project team with regional geology of the Zagros area, and also organized excursions to most interesting localities. Then the team toured the area along a few passable roads in order to acquire basic geological information on the area to be surveyed. The area of the Zagros Mountains was

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divided into two parts: a southern part (Camp I) and a northern part (Camp II). The field mapping group consisted of 2 Czech geologists (senior and junior or a technician), and a young Iraqi geologist (a trainee), Jeeps were used to get as close to the mountains as possible and then mules and horses. The second camp was located near the town of Penjwin at a higher altitude relative to the first camp. During six months of field work in 1976 a total of 2800 square kilometers were mapped at a scale of 1: 20 000. The survey was supposed to continue in 1977, but due to unrest in the area, it was possible to carry out only revision tours, and the expedition was then terminated. During the winter of 1977 – 1978 in Prague, a "Final Report on mapping in the Zagros mountains" was elaborated and in the spring of 1978 was approved in Baghdad.

MAPPING IN THE WESTERN DESERT

The SOM chose the Western Desert, an area between the borders of Syria and Saudi Arabia as an alternative for the failed mapping in 1977. The project for this mapping was compiled by Dr. Buday and Dr. Hak who then became the head of the expedition. The first field camp was established in the spring of 1978 in the desert camp of Ga'ara, north of the town of Rutba. Roughly 20 geologists were involved in mapping an area extending from Ga'ara up to then Syrian borders, including the vicinity of the large phosphate deposit of Akashat. After the summer break, the mapping continued in the autumn of 1978, and again the Czechoslovak geologists were accommodated in Ga'ara. The third field season took place in the spring of 1979, and the team was accommodated in the abandoned village of Al-Hazimi, West of Rutba. Up to 25 geologists worked in this area that extends from the camp to the border with Saudi Arabia. During three seasons an area of 32000 square kilometers was geologically surveyed. Brief revision tours took place in autumn 1979, and the team also consisted of certain specialists such as paleontologists, economic geologists, etc. Since the winter of 1979, in Prague the project team worked on the elaboration of the Final Report on the Western Desert survey. It included a set of 13 geological maps at a scale of 1: 100 000, and a relevant text describing and highlighting all the major geological and other features of the entire area surveyed. The Final Report was accepted and approved by the Iraqi counterpart in Baghdad in the autumn of 1980.

After completion of the "desert" expedition, the Iraqi counterpart asked for elaboration of a project report that would be focused on the search for glass sands and ceramic clays in the wider area around Rutba. This project was compiled in 1981 by Dr. Opletal, Dr. Buday, Dr. Hak and Ing. Linhart of the Czech Geological Survey and Dr. Nýpl of Baugeologie Wien. This project included detailed geological mapping, exploratory drilling, and technological tests aimed at the definition of Cretaceous deposits of glass sands and Permian clays suitable for the production of ceramics. This project was approved in Baghdad in the spring of 1982, but was not implemented due to the ongoing war between Iraq and Iran.

In spring of 1989, Dr. Hak visited Baghdad for a short period to work out, together with Dr. Khaldoun Al-Bassam, a project that focused on geochemical exploration (heavy mineral survey and stream sediment survey) of the Mawat area in Kurdistan. The implementation of this project was prevented by the first Gulf War.

BRIEF SUMMARY OF OTHER PROJECTS IMPLEMENTED IN IRAQ

A geophysical survey, exploration and search for mineral resources were carried out in the 1970s and 1980s, and included a regional gravimetric survey of the Western Desert. In two years a map of Bouguer anomalies was compiled at a scale of 1: 100 000 covering an area of 45000 sq. km. A Baghdad – Kirkuk calibration and testing base was established and the network was interconnected with the World Gravity Network. The geophysical survey continued with seismic measurements in the Ghalaisan area using the Vibroseis technology. At the same time an exploration intended to determine oil-promising structures began and then continued by drilling a number of exploratory wells in the area investigated. The pumping tests brought positive results in many cases. Then in 1980 – 1982, exploration and drilling of 10 wells, up to 4000 m deep, were carried out. Four to seven oil-bearing horizons were detected in each well.

Engineering geologists and hydrogeologists carried out investigations in a few structures: in 1973 the Al-Quaim Dam, in 1980 – 1981 the Kaolos Dam, and in 1983 – 1984 the Zakho tunnel at the Iraqi – Turkey border. The geophysical and engineering geological projects were undertaken by Geofyzika Brno and by Stavební geologie Praha. None of these enterprises exists anymore, and therefore more details on their activities in Iraq are difficult to obtain.

PUBLICATIONS OF CZECHOSLOVAK EXPERTS ON IRAQ GEOLOGY

The Czechoslovak geologists, thanks to their long presence and work in Iraq, seem to have become well acquainted with the geology of Iraq. They showed it by elaborating and publishing a spectrum of scientific works and studies related to the geology of Iraq. The knowledge and skills of the Czechoslovak geologists have been proven especially in the monograph entitled (Geology of Iraq), the main organizer and the first editor of which is Dr. Saad Z. Jassim and the second editor is Jeremy C. Goff. Dr. Saad was also a co-project manager of the mapping projects in Kurdistan and in the Western Desert. He gained up a lot of experience from Dr. Buday, although the monograph was printed five years after Dr. Buday's death. Dr. Saad Jassim realized that many Czechoslovak geologists are experts on the geology of Iraq, and invited them to write a series of chapters in this book. The Geology of Iraq was printed in 2006 in Brno with the financial support of Dolin Company, Prague. The publication was welcomed by many world geologists as an excellent compendium describing not only the geology and tectonics of Iraq with the adjacent regions, but also its mineral potentia and ground water resources. The book is also an excellent source of references of papers written by a range of Iraqi and foreign geologists.

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CZECHOSLOVAK EXPERTS WHO WORKED IN IRAQ

A tentative list of experts who worked in Iraq, mostly with the State Organization for Minerals and some teaching at the Baghdad University is given below. It is very difficult to compile a complete or exhausting list of professionals who used to work in Iraq because the first people started working there in early or mid 1960s. Moreover, the organizations or institutions which were recruiting the experts or providing them to work in Iraq do not exist anymore (Geofyzika Brno) or their activities are nowadays restricted or changed completely their job contents (Polytechna Foreign Trade Company, Strojexport Foreign Trade Company). Their archives are either non existent anymore or difficult to be reached. Quite a few experts passed away and most of them are retired and difficult to access. The list is not arranged in alphabetical order and no academic titles are given, although the majority of them do or did have Ph.D. degrees. Those who died are marked with (+), those whose fate is unknown are marked with (?). Their major field of activities are given briefly at their names. It was also difficult to find out the period of time they used to work in Iraq.

- Buday Tibor, Czech Geological Survey (CGS), Carpathians, petroleum geology, regional geology, stratigraphy (SOM).(+))
- Vaněček Mirko, Charles U., economic geology, metallic ores (SOM).
- Mašín Jan, Charles U., Geofyzika Brno n.p., geophysics (SOM).(?)
- Janáček Josef, CGS, Carpathians, petroleum geology (SOM).(?)
- Bližkovský Milan, Geofyzika Brno, geophysics (SOM).(+))

- Pelc Zdeněk, CGS, petrology, geol. mapping, crystalline rocks, Bohemian Massif (SOM).(?)
- Čtyřoký Pavel, CGS, zoopaleontology, stratigraphy, geol.mapping, Bohemian Massif, Carpathians (SOM).(+)
- Dornič Jan, CGS, geol. mapping, remote sensing, Mesozoic, Tertiary, Bohemian Massif, Carpathians (SOM).
- Sattran Vladimír, CGS, petrology, economic geology, Bohemian Massif, expert in other foreign countries and in Int. organizations (SOM 1971 – 1973).
- Rubeška Ivan, CGS, chemistry, spec. lab., expert UNDP (SOM).(+)
- Chaloupský Josef, CGS, geol. mapping, regional synthese, stratigraphy synth., crystalline rocks, Bohemian Massif, (University Mosul).(?)
- Kukul Zdeněk, CGS, sedimentology-synth., regional geology-synth., sedimentary petrology, University of Baghdad 1966 – 69, SOM (NIMCO) 1975 – 76.
- Slavík Jiří, CGS, sedimentology, mineralogy, Cretaceous, (SOM).(?)
- Melka Karel, CGS, mineralogy, spec. lab. (SOM).(+)
- Hradecký Petr, CGS, petrology of magmatites, volcanology (synth.), regional geology.
- 1975 – 1978 SOM. Geol.mapping in Jebel Hamrín (1975 – 1976), Zakho – Shiranish (1976 – 1977), northern part – Jebel Shaklawá and others in v High Folded Zone (1977), NE part of Khanaquin, border zone with Iranian border (1978). Consulting work for INOC, in 1979 investigation of karst cavities in the Western Desert near K2 and along the River Euphrates. 2 papers in Journal of Iraqi Geol. Association.
- Šantrůček Pravoslav, CGS, economic geology, technology, platform sediments, Bohemian Massif.
- Tyráček Jaroslav, CGS, Quaternary, synth., management (SOM).
- Laboutka Miroslav, CGS, hydrogeology (SOM).(?)
- Minaříková Dagmar, CGS, Quaternary, sedimentology (synth.), mineralogy.
- Špačková Alena, CGS, analytical chemistry, spec.lab. (SOM).
- Pesl Václav, CGS, mapping, regional geology, Carpathians.(?)
- Růžička Miloš, CGS, mapping – Mesopotamian Plain project (1: 50 000, 1: 200 000) (SOM 1978 – 1980), similar activities as Dr. Domas.
- Šebesta Jiří, CGS, geomorphology, environmental geology, regional geology, mapping, Bohemian Massif (SOM).
- Mašek Jan, CGS, stratigraphy, petrology, crystalline rocks, (SOM).
- Krásný Jiří, CGS, hydrogeology, mapping, synth. (SOM).
- Petránek Jan, CGS, sedimentology, petrology, economic geology (SOM).
- Škvarka Ladislav, (GÚDŠ-Slovak Geological Survey), hydrogeology (SOM).(+)
- Domas Jaroslav, CGS, Quaternary, mapping, Bohemian Massif.
- 1975 – 1980 Quaternary of the NW Iraq, Quaternary of the Mesopotamian Plain.
- 1981 – 1982 Quaternary of the Mesopotamian Plain (SOM), the only expert who spent the longest period of time working with SOM in one stretch.
- Domáci Luděk, CGS, mapping, economic geology, platform sediments, Bohemian Massif (SOM).
- Mazáč Oldřich, Geofyzika Brno, geophysics (SOM).(+)
- Macháček Václav, CGS, geochemistry, spec. lab. (SOM).(+)
- Zajíc Josef, CGS, engineering geology (SOM).(+)
- Pražák Jiří, CGS, mapping, Cretaceous, stratigraphy, zoopaleontology (SOM).(+)

- Vejlupek Miroslav, CGS, mapping, regional synth., economic geology, Bohemian Massif, mapping in Kurdistan, Low and High Folded zones (SOM 1972 – 1975).
- Skoček Vladimír, CGS, sedimentology, sedimentary petrology, synth. (University of Baghdad 1969 – 1971).
- Matolín Milan, Faculty of Science, Charles U., geophysics (University of Baghdad 1968 – 1970).
- Válek Rostislav, Faculty of Science, Charles U., geophysics (University of Baghdad 1964 – 1966).(+)
- Kantor Ján, GÚDŠ, Slovak Geological Survey, geochronology, spec.lab. (University of Baghdad).(?)
- Dufek Jan, Stavební geologie n.p. (Engineering Geology) hydrogeology (SOM).
- Hak Jaroslav, CGS, mineralogy, geochemistry, economic geology (SOM 1978)