sandstone of the Kikla formation contains several lenses and layers of claystones which are commonly bordered by small bands of fine-grained iron hydoxides. Besides this type of *synsedimentary* goethite a second type of iron hydroxides occurs, forming brown concretions of goethite mainly in the lower par of the Kikla formation. These concretions vary in size between 2 and 80 cm in diameter and include a greenish claystone consisting of a true, well-ordered kaolinite. Both iron hydroxides, the synsedimentary layer-type I and the diagenetic concretion-type II contain the same iron mineral (goethite) but differ in the structural state (in the degree of structural disorder) of this goethite, in their accessories and in their trace element patterns.

New Findings of Tertiary fauna in Jabal Hasáwnah /Central Libya/

Zdeněk V. Špinar, Zbyněk Roček

In the course of geological survey of central Libya, organised and supported by Industrial Research Centre, Tripoli, a new freschwater series of Tertiray age was discovered and named Taráb Formation. The profile of the type locality of this series (western foot of Jabal Hasawnah; on the geological map of Libya 1:50,000 sheet 2081-II, point No 20) demonstrated that the series is formed by clay sediments with several thin carbonatic beds. These sediments, arisen by filling the small basin, are of the oligocene age, according to recent study. In open parts of the profile 5 carbonatic beds were found. The uppermost one is sterile, the remaining 4 are fossiliferous, containing gastropod shells, numerous skeletons and imprints of fishes (Pisces), frogs (Anura) and scarce remains of mammals (Mammalia: Hyracoidea).

Gastropod shells were found both in carbonatic beds (layer II-V) and in silicified fragments of rock found on the surface in the surroundings of the profile. In carbonatic beds, 2 specimens belonging probably to the family Cochlicopidae or to the family Vertinidae were found. Owing to the fact that shell apertures with decisive diagnostic characters are destroyed, exact determination will not be possible. In silicified fragments found outside the profile 2 species of gastropods were ascertained. The majority of relatively well preserved shells probably belongs to the family Melanidae. Another specimen which is strongly demaged probably belongs to the family Succineidae.

In the locality under study, the fossil remains and imprints of fishes are predominant among other vertebrates. They are relatively well preserved and abundant. The material for study consists of more then 100 specimens, which are almost complete and many fragments. According to our study they belong to the species Palaeochromis rousseleti Sauvage, 1907 (family Cichlidae Bleeker, 1859). In the material we had at our disposal there were fishes of medium size attaining the body length 53-120 mm (without tail fin). They possessed a conspicuously large head (about one third of the body length). The dorsal fin was long and continuous, with 12-13 firm spines and about 12 soft rays. The anal fin consisted of 3 hard spines and 8-9 soft rays, the abdominal fin of 3 hard and 5 soft rays. The pectoral fin was not supported by any hard spines and consisted only of 12 soft rays. The distal margin of the caudal fin was almost straight and the fin was supported by 22 rays. The scales were of the ktenoid type, usually with 7-12 radial lines. Intermaxillare and dentale bore several rows of long and conical teeth.

In laminated limestone the remains of frogs were also found: 15 incomplete skeletons and 7 imprints without preserved bones. They are small pipid frogs attaining body length of 42 mm. The frontoparietals of adult specimens are fused. These bones are narrow on the rostral end, while on the caudal end they are robust and vaulted. They fuse with occipitalia lateralia, and in some specimens also with ossa prootica. Otic capsules are conspicuously large, and in some specimens separated by the groove from frontoparientals. The vertebral column and pelvis are similar to those of Xenopus leavis and consists of 9 opisthocoelous vertrebrae. Sacral wings are slightly narrower than in above mentioned recent species. Femur is horter then crus. Astragalus and calcaneus are separated. Metacarpals and metatarsals are long which demenstrates the permanelty water-dwelling habitat of the frogs. Preliminarily we can state that these frogs belong to a new genus, considerably different from the genus Xenopus.

Among other findings there are also 2 incompletely preserved skulls, 1 almost

complete postcranial skeleton and 3 fragments of various body parts of a mammal Titanohyrax palaeotherioides (Schlosser, 1910) (Hyracoidea: Geniohydae). Dorsal side of the skull No L-RŠ-77 is quite smooth. Teeth can be studied only in lateral view; only PM_{2-4}' M_{1-2} PM^{1}-4 and M 1-2 are distinct. M_2 dex. is solenodont The other preserved teeth are brachiodont, with conspicuous cingulum. As the specimens are young and immature, the teeth are rather small and the hindmost molars are still hidden inside the jaw. Howver, the description of teeth form agrees with data from the literature. The best preserved postcranial skeleton No 4-L-RŠ-77 demonstrates that the specimen is as large as a big rabbit or a cat. The adult animal certainly was much larger. The outline of the frontal part of the skull No 15-L-RŠ-77, together with the nasal bone and small lower incisor, are evidence of a form with a long rostrum.

Groundwater studies in the Triangle ben Ghashir-Tajoura-el Zawia (Tripoli, Libya), using radioisotope Techniques

F. M. Swailem, A. M. Eskangi, R. E. Shoheib and B. M. Mabrook

The problem of continuous lowering of underground water level due to exhaustive pumping, in the triangle Ben Ghashir-Tajoura-El Zawia makes it essential to study recharge processes in this area Periodical field and laboratory works have been executed twice per year for a period of about five years. The work were undertaken in six representing localities in the area during the recharge time (winter time) and the discarge time (summer time).

The work includes complete chemical analyses of water, tritium measurement, determination of aquifer parameters as productivity, transmissibility and storage coefficient; and identification of direction and velocity of groundwater flow using radioisotope tracer techniques. The results are interpreted considering the geological and hydrogeological conditions of the region.

Geochemical and Mineralogical Investigations on evaporites of the Zouila Sabka Fezzan

Heinz J. Tobschall and Werner Smykatz-Kloss

The sabkha of Zouila is located about 120 km S of Sebha in central Fezzan. It is nearly 12 km long (E-W) and 2 km broad in S-N direction. Because of being dry during 11 months of the year, there are only few spots at the deepest depression of the salt lake which are filled with water. For the present study 20 samples have been collected from the rim of these "water holes", from two cross sections and from the hills of the northern surrounding area. Geochemical analyses for alkali and earth alkaline metals, for Fe, Si, Al and Mn, and mineralogical analyses by means of X-ray diffraction have been carried out. The variation in theamounts of occurring minerals halite, sylvite, carnallite, glauberite, gypsum, anhydrite, mirabilite, thenardite, quartz, goethite, kaolinite, calcite, and dolomite and the genesis of these minerals have been discussed.

A Review of the Investigations on the Wadi al Shatti Iron Ore Deposits, Northern Fezzan, Libya

T. M. Türk - A. K. Doughri and Syamadas Banerjee

This paper reviews the results of investigations carried out by the French Group between 1971 and 1976 in two stages, on the iron ore deposits of the Wadi al Shatti in northern Fezzan.

An area of about 3,000 sq.km. was geologically mapped on 1:40,000 scale, from east of Ash Sheb to west of Gottah, a distance of about 160 km. Further detailed mapping of about 255 sq.km. was done on 1:10,000 scale in the Ashkeda and South Taroot areas.

The iron ores occur in the Devonian Aouinet Ouenine Formation of Jabal Fezzan, in a 140 m thick sedimentary sequence ranging in age from Upper Frasnian to Strunian (Upper Devonian). There are threee important iron ore horizons.

The best type of the ore is the magnetic reduced ore having a proved reserve of 420 m. tons with about 55% Fe content, along with a proved reserve of 375 m. tons pf non-magnetic reduced ore and 100 m. tons of oxidised outcropping ore in the South Taroot area, about 40 km west of Brak. The total inferred reserve of all types of ores is about 3.5 billion tons, Fe content varying between 35% and 55%.