

INTERNATIONAL SYMPOSIUM ON THE CARBONIFEROUS AND PERMIAN SYSTEMS IN SOUTH AMERICA



International Symposium on the Carboniferous and
Permian Systems in South America (1972 : São
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excursion guide-book - e.1

EXCURSION GUIDE-BOOK

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1972

Remains of the mesosaurid reptilian *Mesosaurus brasiliensis* McGregor may be collected from these beds. Average thickness: 6.50 meters.

- 2) **Middle barren beds** — Bright to dark-gray or bluish shales in the lower part, followed up by shales interbedded with dolomite beds. Average thickness: 8.60 meters.
- 1) **Lower shale beds** — Dark-brown to black, fissile, pyrobituminous shales, harder than at upper horizon. Average thickness: 3.20 meters.

Afternoon program

São Mateus to Curitiba

Guide: A. C. Rocha-Campos

Road-log prepared by: A. C. Rocha-Campos, M. E. C. B. de Oliveira, P. R. dos Santos and A. R. Saad.

The section exposed along the São Mateus-Curitiba road demonstrates the lithological features and facies of the lower formations of the Passa Dois Group (Irati and Serra Alta) and of the Tubarão Group (Itararé Subgroup, Rio Bonito and Palermo formations) in the area south of the Ponta Grossa Arch (Fig. 17).

The road cuts the formations in a direction roughly perpendicular to the general strike of the beds and the rocks will be examined going down stratigraphically. The best outcrops belong to the Irati Formation and Itararé Subgroup. Sandstones of the Rio Bonito Formation may also be seen.

For mapping purposes the Itararé Subgroup has been recently subdivided in the area south of the Ponta Grossa Arch into three informal units by Petrobrás geologists.

The upper unit includes shales considered equivalent to marine shales of central Paraná State ("Passinho shale"), from which a fauna with brachiopods and mollusks was identified (Rocha-Campos, 1970). Other shale beds occur in the section.

Diamictites are common and a few excellent exposures will be examined. They may be massive, or may include interbeds and deformed masses of sandstone (mud-flow facies). A few may represent ground moraines. Some good exposures of lacustrine facies including varved shales will be seen.

The middle and lower part of the section is also characterized by the inclusion of important sandstone bodies representing channel deposits, some forming mappable units (Lapa Sandstone) of the fluvial facies of the Itararé (Fig. 19).

Departure time: 14:30 P.M.

Km 138.7

Stop for 15 minutes.

Upper and lower dark-gray shale bands separated by zone of intercalations of shale and dolomite beds of the Irati Formation on both sides of road. Upper gray, non-bituminous siltstone belongs to the Serra

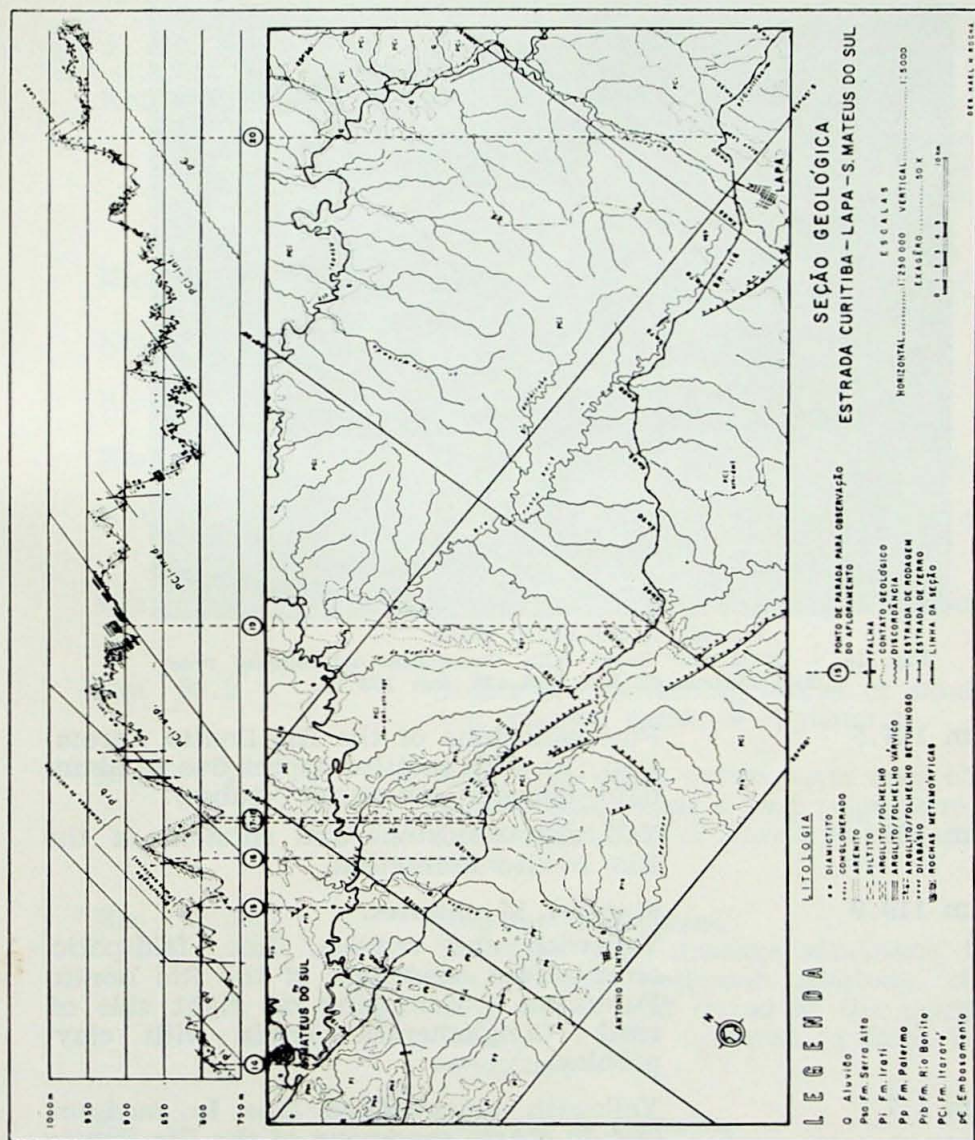


Fig. 17 — Geological section and map along the road São Mateus do Sul-Curitiba (from Medeiros, 1971).

Alta Formation. Same beds examined at the mine. Outcrop demonstrates well the different appearance of same rocks in outcrop due to weathering (Fig. 18).

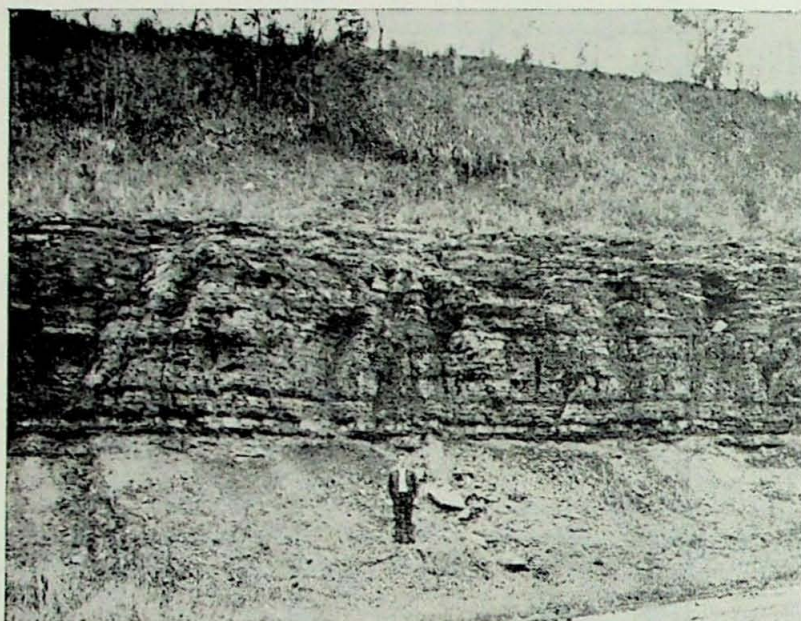


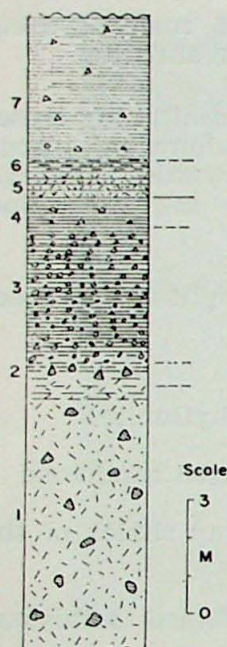
Fig. 18 — Irati and Serra Alta formations outcropping near São Mateus do Sul (BR-476, km 138.7).

- Km 124.5 Fine sandstone of the Rio Bonito Formation (P) with mottled aspect due to abundant biogenic structures (tubes).
- Km 121 Yellowish sandstone and siltstone of the Rio Bonito Formation.
- Km 119.9 **Stop for 15 minutes.**
Yellowish and reddish, fine, feldspatic, cross-bedded sandstone of the Rio Bonito Formation outcropping on right side of road. Conglomeratic levels with clay-pebbles.
- Km 117 Yellowish cross-bedded fine to medium, locally coarse sandstone of the Rio Bonito Formation.
- Km 116.6 According to recent mapping by Petrobrás (Medeiros, 1971) at this point one could see the contact between fine to medium,

- light-brown, cross-bedded Rio Bonito sandstone and Itararé shale. Outcrop on left side of road.
- Km 102 **Stop for 20 minutes.**
Quarry on right side of road exposing light-gray, sandy matrix diamictite.
- Km 101 Greenish-gray diamictite containing lenses or deformed blocks of medium, micaceous sandstone. Passes downwards transitionally to rhythmite, fine sandstone and dark-gray shale.
- Km 100.5 Light-gray diamictite on right side of road.
- Km 99.2 Yellowish-greenish shale.
- Km 98 Medium-gray shale and rhythmite.
- Km 97.9 Gray shale with intercalated sandstone.
- Km 96.8-86.9 Successive outcrops of gray shales of the Itararé Subgroup.
- Km 82.3 Diamictite lenses and folded sandstone beds included in shales.
- Km 80.2 Diamictite containing blocks of sandstone and internal bands of rhythmite.
- Km 79.2 From this point participants may observe in the background a long ridge formed by a lenticular body of Itararé Subgroup sandstone.
- Km 78.5 **Stop for 15 minutes.**
Yellowish fine, massive sandstone intercalated with yellowish siltstone, chaotically folded and mixed at the margin of channel. Passes upwards to thick bedded sandstone.
- Km 717 **Stop for 30 minutes.**
Yellowish-greenish, sandy diamictite with interbeds of elongated bodies of coarse or conglomeratic sandstone disposed in a concentric manner, simulating a channel, outcropping on both sides of road. Sandstone

bodies may show cross-bedding being disrupted and deformed.

Km 65.2



Stop 30 minutes.

DER quarry showing exceptional exposures of set of lithologies of the Itararé Subgroup. Medium-gray, sandy diamictite at the base with erratics up to 1.5 m passes upwards transitionally to gray shale and rhythmite heavily charged with dropped clasts of basement rocks, as well as, shale, sandstone and diamictite. Rest of the section is composed of finely stratified diamictite, rhythmite and shale. Abundance of dropped clasts diminishes gradually upwards. This section may represent part of a cycle of glacial deposition of diamictite as a moraine, followed up by stagnation and subaqueous deposition of varved shales and shales (Fig. 19).

Fig. 19 — Diamictite, rhythmite and shale of the Itararé Subgroup outcropping at the DER quarry, road S. Mateus-Curitiba, km 65.2. Explanation: 1: diamictite; 2: shale; 3: rhythmite; 4: shale; 5: finely stratified diamictite; 6: and 7: shale; interrupted line: transitional contact; solid line: sharp contact.

Km 64.2

Entrance to Lapa.

Km 63.7

Rhythmites and shales on right side of road (Fig. 20).

Km 62.0

From this point excursionists may observe the background, the elongated outcrop of Lapa sandstone, an important member of the basal part of the Itararé Subgroup (Serra do Monge). The sandstone lens forms a long and sinuous ridge of general north-south trend (Medeiros, 1971) (Fig. 21).

Km 58.9

Stop for 15 minutes.

Lapa sandstone. Fine to coarse, pink, feldspatic sandstone, irregularly stratified or with cross-bedding. Conglomeratic layers with shale pebbles may occur.



Fig. 20 — Dark-gray shale of the Itararé Subgroup. Road São Mateus do Sul-Curitiba, km 63.7.

Km 38.9	Entrance to Lagoa das Almas.
Km 37.6	Entrance to Contenda.
Km 29.6	Bridge over the Iguaçu River.
Km 28.6	Araucaria.
Km 25.8	Junction with BR-116. Turn north to Curitiba.
Km 0	Curitiba. Overnight stop.

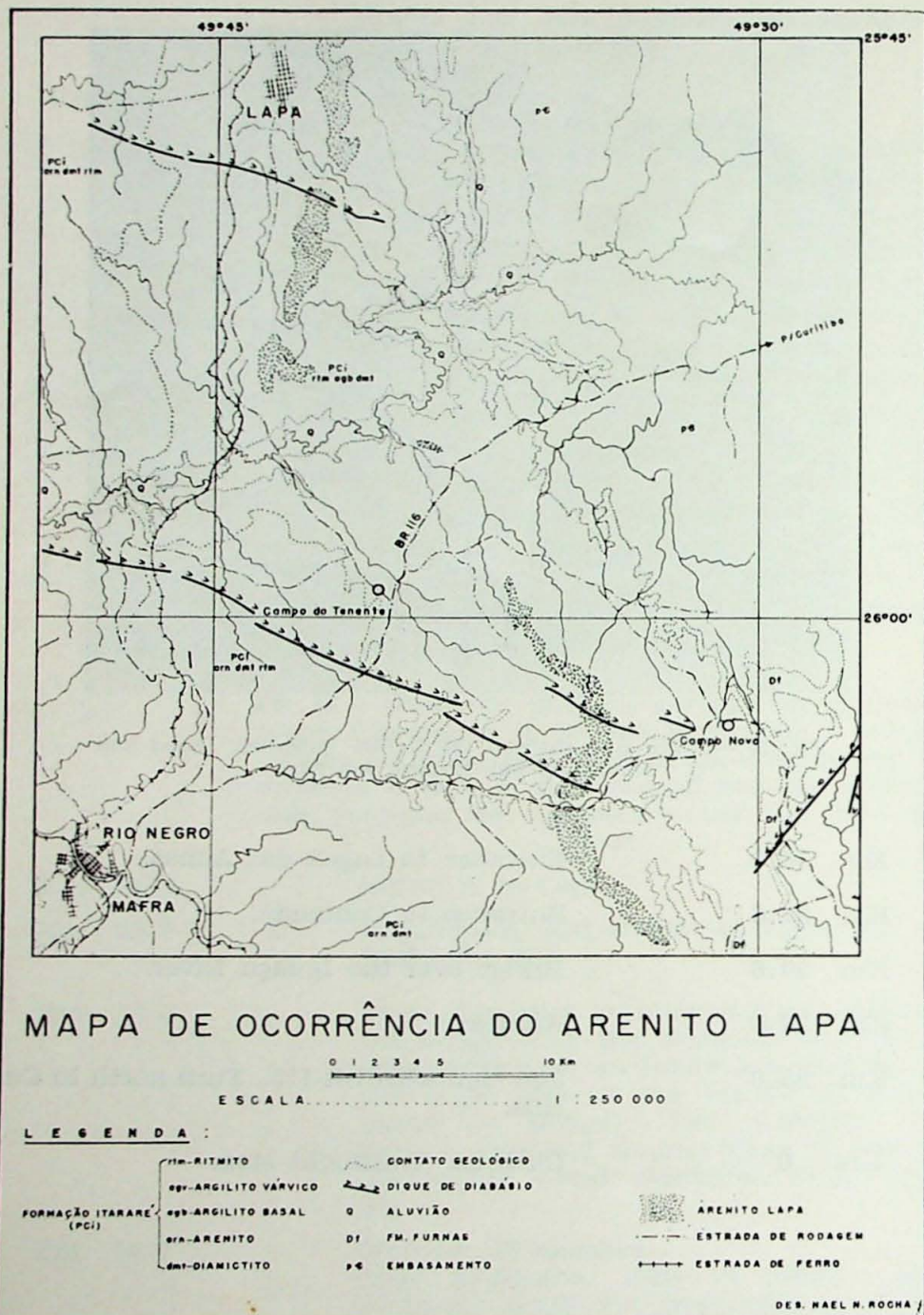


Fig. 21 — Geological map of the Lapa sandstone (lower Itararé Subgroup), south Lapa, Paraná (from Medeiros, 1971).