The rocks of Paraná are classified into four groups according to their stratigraphical position: Cretaceous, Paleozoic, and Proterozoic. The Cretaceous rocks, deposited in the western part of the region, are mainly composed of sandstones, siltstones, and shales. The Paleozoic rocks, which are found in the eastern part of the region, are mainly composed of sandstones, siltstones, and shales, with some coal beds. The Proterozoic rocks, which are the oldest, are mainly composed of sedimentary rocks, such as sandstones, siltstones, and shales, with some igneous rocks.

The Paraná Basin evolved for more than 300 million years, in long and relatively calm evolution. The state's second and third plateaus. In the early stages of the basin's evolution, South America and Africa were still parts of a single landmass called Gondwana. The breakup of Gondwana, and the consequent separation of South America and Africa, started in the Jurassic period. As part of the breakup process, extensive, up to 1,500 m of desertic terrains (the Bauru Basin) spread over the basalt flows in the region known as the Paraná Shield, whose strong relief reflects how resistant the basaltic rocks are to erosion.

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The riverbed of the Tibagi is quite irregular, with hollows carved out by water, and the third plateau in the State of Paraná. Early in the evolution of the basin, the global distribution of continents was quite different from the present one. The last boundary, now corresponding to South America and Africa, were still parts of a single landmass called Gondwana.

The long and relatively calm evolution of the Paraná basin allowed sediments to deposit from a variety of environments, such as marine, estuarine, fluvial, and glacial. The sediments are cut by Mesozoic diabase and microdiorite dykes that formed during the rifting process. The dykes, which are rich in iron and magnesium, are responsible for the magnetic properties of the region. The dykes were emplaced between 160 and 180 million years ago, during the breakup of Gondwana.

The Gold and Diamond content in the region is due to the presence of diamonds, which are formed deep in the Earth's mantle. The diamondiferous rocks are cut by Mesozoic diabase and microdiorite dykes that formed during the rifting process. The dykes, which are rich in iron and magnesium, are responsible for the magnetic properties of the region. The dykes were emplaced between 160 and 180 million years ago, during the breakup of Gondwana.

Fossils are precious records of past epochs, in that their generation requires a precise set of conditions without which organisms would not be preserved. The fossils found in the region include footprints, shells, teeth, and bones of ancient creatures. The fossils are used to understand the history of life on Earth and to reconstruct the past environments. The fossils are also used to study the evolution of species and the changes in the Earth's climate.

The pedra branca mountain range, which contains the paraná hill, is a peculiar elevation approximately one meter high. It consists of white, calcareous, sandstone sandstones that stand out in the landscape for its peculiar configuration, that can be viewed from far. The differentiation is due to a combination of factors, including the presence of a salt dome and the fact that its structure is located in a fault zone. This makes the pedra branca mountain range a unique and interesting geological feature.