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Ferrière, Ludovic; Feignon, Jean-Guillaume; Baratoux, David; Koeberl, Christian

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PRISON BREAK AND THE TENTATIVE EXPLORATION OF THE BATEKE PLATEAU STRUCTURE, A POSSIBLE METEORITE IMPACT CRATER LOCATED IN EITHER GABON OR CONGO.

L. Ferrière¹, J.-G. Feignon², D. Baratoux³, and C. Koeberl², ¹Natural History Museum Vienna, Burgring 7, A-1010, Vienna, Austria (ludovic.ferriere@nhm.at), ²Department of Lithospheric Research, University of Vienna, Althanstrasse 14, A-1090 Vienna, Austria, ³Géosciences Environnement Toulouse, CNRS, Université Paul Sabatier Toulouse III and IRD, 14 Avenue Edouard Belin, 31 400 Toulouse, France.

Introduction: Currently, about 200 meteorite impact structures are recognized on Earth, but many others are still to be discovered/confirmed. One of them is the Bateke Plateau structure, centered at 0°38'45''S / 14°27'29''E, located in the Djoué Department of the Haut-Ogooué Province, in eastern Gabon, only a few kilometers west of the border with the Republic of the Congo (the geographic location stated here is based on current internationally recognized country borders). The approximately 7-km-diameter Bateke Plateau structure was suggested (using satellite imagery) to be a possible impact structure by [1]. However, its recognition and confirmation as an impact structure needs to be supported by unambiguous evidence of shock-deformation or traces of extraterrestrial matter [e.g., 2], which was the motivation for our (L.F. and J.-G.) expedition there in February 2020.

Preliminary work: The Bateke Plateau structure is easily visible on satellite imagery, defined by over 1 km wide hills (relatively free of vegetation), delineating a "ring structure" around a central part with dense forest cover. Within the central area, small hills (free of vegetation) define an incomplete circular feature. Digital elevation modeling indicates that the structure comprises two nested toroidal rings with an intermediate ring-shaped depression, the outer toroid having a diameter of 5.8 km and a width of 1.3 km, and the inner ring feature having a diameter of 1.4 km and a width of 700 m (see also [1]). Based on available regional geology, it seems that the region is dominated by Paleogene to Neogene sedimentary rocks of the Bateke Plateau [3], mainly sands and conglomerates, unconformably overlying Archean to Paleoproterozoic basement rocks [4].

Results and Discussion:

The reality of the field: When planning the journey to the Bateke Plateau structure, we knew that it would not be easy to reach it. After a flight from Vienna (Austria) to Libreville (Gabon), then crossing almost the entire country of Gabon by train, and making a stopover in the city of Moanda, the last 155 km of asphalted road and ~70 km (as the crow flies) of "gravel road" to reach the village of Onga were covered with a 4x4 vehicle. After a short night in Onga, villagers were hired to drive us with motorbikes to the Bateke Plateau structure. After ~18 km (as the crow flies) through grassy and shrubby savannas, interspersed with small forests, we arrived at our destination, in the village of Yabambeti (unnamed on available maps) located in the W-SW sector of the structure. It did not take very long until the village chief told us that we were actually in the Republic of the Congo! (but based on available maps and GPS the border was still more than 8 km to the East). Not having any official documents from the Congo, we were asked to either (1) go to the city of Ewo (50 km SE as the crow flies) to "regularize our situation" or (2) to go back on our tracks to Gabon. We chose option (2), but only on the next day as it was already early afternoon and we argued that it would be safer to wait until the next morning. The idea was to use the few hours in front of us to collect some samples. However, we were not allowed to collect anything (and anyway, no rock was to be seen around). L.F. then asked for permission to take a shower, in the hope to find rocks along a river, however, only sand was to be found and a sample (i.e., a bag of sand) was discreetly collected. It was already mid-afternoon, when suddenly a small police truck appeared out of nowhere. We were arrested and transferred to the city of Ewo (during the transfer we were able to send a message to the wife of the previous French ambassador in Vienna).

Prison stopover(s): After hours of interrogation, we were taken into custody. On the next day it was decided that we would be transferred to the capital city of Brazzaville, ~600 km to the South. After a full day's journey on the road, we finally arrived at night at a prison where we stayed for the next three days until our release... On the next day, we were given back all our equipment and personal belongings that were transported by the Congolese authorities all the way from Yabambeti to Brazzaville. We were happily surprised to find not only the bag with sand but also two rock boulders (a quartzite and a sandstone), likely collected by one of our motorbike drivers (?).

Petrographic work: Thin sections prepared from the three samples were studied using the optical microscope for shock metamorphic features, but unfortunately no evidence of shock was found. *To be continued...*

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References: [1] Master S. et al. (2013) *Proceedings of the 13th SAGA Biennial Meeting*. [2] French B. M. and Koeberl C. (2010) *Earth-Science Reviews* 98:123–170. [3] Thomas R. J. et al. (2002) Carte géologique de la République Gabonaise 1:1,000,000. [4] Thieblemont D. et al. (2009) Notice de la Carte géologique et des Ressources minérales de la République Gabonaise (1:1,000,000), 384 p.