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A reply to Martill - The Bearable Heaviness of Liability

Langer, M. C., R. Iannuzzi, A. A. S. da Rosa, R. P. Ghilardi, C. S. Scherer, V. G. Pitana & T. L. Dutra (Sociedade Brasileira de Paleontologia) take issue with Dave Martill over conservation measures in Brazil.

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Many people in Brazil are amazed by [Martill's feature](#)¹, a reply to our rearlier letter², an astonishment felt also in other South American countries³.

First of all, it is vital to correct two of Martill's misquotes:

1. we are not proud of Brazilian laws regarding fossil collection, and
2. we do not think of the fossil trade as a "bad thing". How can we be proud of our single "tree-lines" regulation from 1942⁴, and the draft documents protecting Brazilian fossil heritage that have been sitting idle for more than fifteen years in the politicians' offices in Brasília⁵⁻⁶? No one stated that the Brazilian laws are ideal, and the lack of more comprehensive rules is affecting Brazilian palaeontologists more than anyone else.

On the second misquote: the opinions of people forming the directory of a non-profit private organization such as "Sociedade Brasileira de Paleontologia" is irrelevant in face of the current legislation, as is that of any other private party. In fact, no matter what the views of others are, Brazilian law considers (both to native Brazilians and to foreigners) the unauthorized collection of fossils to be illegal, as well as the trade of fossils coming from any unauthorized excavations and the unauthorized export of any fossils.

In the end of his text, Martill calls enlightened palaeontologists to lobby against draconian Brazilian laws regarding fossil collection. It is well that Martill realizes that the proper way to change legislation is to democratically lobby against them; however, the strange thing is that throughout the rest of his post he promotes a more unsophisticated solution: simple disrespect for the law. Well, this is something that cannot be endorsed! Scientists are free to choose where and how they will conduct their field research, but if you are going to work in a foreign place, you may be charged for not following its regulations.

Although Martill seems to praise corruption (in the end of his second paragraph), this is perhaps (besides poor education) the worst problem in Brazilian society. But we should not be alarmed! Martill has the answer to Brazilian corruption and its drawbacks in his fourth paragraph. Because Brazil will never be able to abolish criminal acts (which country will?) such as corruption, just don't worry about them. It's a very simple psychological solution: if you can accept it, there is no problem!

Talking about corruption, according to the 2011 index of Transparency International⁷ Brazil is similar to various other important fossil-bearing/exporting countries such as Morocco, Mongolia, China, and Argentina. Argentina provides a very good comparison, sharing cultural bonds, economics and IDH indices with Brazil. Yet, they have almost no fossil trade, perhaps because their laws⁸ are more detailed (and draconian) than those in Brazil. One of the most important drawbacks of the Brazilian legislation is that it does not set penalties for illegal fossil trade, or do this in an indirect manner⁹⁻¹⁰. Hence, Martill may have "his" fossils confiscated, but will probably never be fined or imprisoned (but see¹¹). We hope he does not see that as an invitation to continue his fossil "digging" in Brazil.

Martill also suggests that fossil trade is good for Brazil and for Brazilian palaeontology. Instead, the Brazilian perspective is that taking fossils out of the country is depleting its scientific resources. Brazil has a growing, but still minor scientific community. For palaeontology, keeping the fossils in the country is a way of promoting scientific opportunities. International partnerships are most welcome, but simply allowing fossils to leave Brazil to be studied by foreign scientists mostly helps science in the other countries. It is fine for scientists to have a more international view of scientific development, but Brazilian authorities have to first think about the development of the country (also in scientific and cultural terms), and their laws will reflect that. States are historically above science exactly because they take other aspects into consideration, the cultural background of their people among them. A

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working case is the use of embryonic trunk cells in research. Most would not deny its importance for science, as we expect most not to deny the right of governments to endorse or not endorse the use of such technology, based on the views of its constituents. This diversity may be harmful to science in short term, but challenging this freedom would certainly bring cultural impoverishment for humankind in long term.

Martill indeed raises some important questions, such as those involving very common Brazilian fossils such as the fish *Dastilbe* (Cretaceous of the Araripe Basin) or *Psaronius* petrified wood (Permian of the Parnaíba Basin), the scientific importance of which are minimized because of their astounding abundance. Yet, his solution seems simply to aggrandize the "current" situation, in which the local people that actually collect fossils are paid pennies, the middlemen take much of the profit, most of the fossils end up on private hands, and the country makes nothing on taxes because the material goes out illegally. Indeed, that process was well explained by Martill, and he surely knows the scheme much better than many of us. Yet, there should be better ways to tackle that problem, in which both the country and the local fossil collectors can profit from the trade on a legal basis. This would require both detailed regulation and qualified personnel to identify and prevent the loss of important specimens. This represents a huge enterprise in any large country, not to mention in the locally corrupt areas of Brazil! In this sense, at present it is appropriate that existing Brazilian laws are mainly designed to protect all kinds of fossils, not only the very rare.

Martill identifies another problem: the loss of fossils due to erosion/weathering or human activities. Again, his solution is to ignore the slow moving authorities, who are not able to save their own treasures, and let illegal rampage take over. It would be enlightening to know his opinion on the recent rescue of a UK fossil left to rot by the authorities on the shores of the Isle of Skye¹²⁻¹³, and its subsequent selling on eBay by progressive, fast moving private parties. Obviously, the loss of fossils during quarrying happens in Brazil as in any other place, but this is not legitimized by law (as mentioned in Martill's 17th paragraph), and some quarries have had their activities impeded because of this type of activity. Yet, this is clearly not the solution as well, because fossils appear during the quarrying, but the lack of personal also hampers their official rescue. Martill implies that amateur palaeontologists could fill that gap. This may be the case in Britain, but without governmental support, the poverty and poor education of the local people completely rule out this possibility in the Araripe area. On the other hand, although it is true that fossils are lost for the above reasons, they are also lost (most probably forever) when exported to private foreign collections. Well known examples include most of the complete articulated holotype of the crocodylomorph *Caririsuchus camposi*, and the partial skeleton of an unnamed bird, which are no longer accessible, except through photographs¹⁴⁻¹⁵.

Although acknowledging that fossils have disappeared from tourist shops, Martill denies most progress made to prevent fossil trading in Brazil. Yet, this is a clear sign of improvement, even if he is still able to purchase them from other venues. Also, at least a portion of the fossils intercepted by the Brazilian police are housed in collections such as that managed by Professors Thomas Fairchild and Juliana Leme at Universidade de São Paulo, and not left to rot as supposed by Martill. No one has stated that the trade is over, and there is much to do regarding the protection of Brazilian fossils. Incidentally, laws "protecting fossils" only criminate people attempting to illegally collect fossils, not palaeontologists in general as suggested by Martill (27th paragraph). In fact, unrestricted fossil collection certainly provides no guarantee that fossils will be collected properly and will end up in accessible collections, just as liberation of guns laws is no guarantee that they will be used only for self defence. No palaeontologist would support actions that plainly prevent fossil collection, but collecting fossils in an incompetent way simultaneously brings some data to science but also loses immeasurable valuable information. Fossil collecting is subsidiary to their proper collection, and this perhaps answers Martill's (26th paragraph) query on the usefulness of protecting fossils.

At this point, it is important to stress that no official authorization to export Araripe Basin fossils has ever been issued by the Brazilian Mining Department (DNPM). "But so what" for Dave Martill? Well, in 2002, the United Kingdom accepted the 1970 UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property¹⁶, and Brazilian law recognizes fossils as cultural property. As such they are part of the Brazilian legacy, even if there was no such thing as Brazil in the Aptian, just as the Coliseum is part of Italian legacy, even if there was no such thing as Italy at the time of its construction. Here we expect palaeontologists, with their unique sense of both deep time and evolution, to keep anthropocentric arguments out of the discussion.

Protecting fossils is, therefore, also a mode of promoting the dissemination of scientific knowledge, so that the Brazilian people may know more about their country's ancient past. What would the Egyptian and Greek people feel if the treasures of their classic civilizations were held in Germany or the UK? "Oh wait a minute... they already are!" We think this says a lot about the understanding people such as Dave Martill have of the fossil "fair" trade.

May the less self-interested foreign palaeontologist help develop Brazilian palaeontology not endorsing criminal actions that mainly benefit their own careers, but working together with Brazilian palaeontologists to better understand and protect the fossil heritage in the country.

Finally, fossils are not for everyone. They are invaluable cultural/scientific treasures that should not sit in a mobster's living room!

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