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| Title | <Book Review>Bili-Uéré: A chimpanzee behavioural realm in northern Democratic Republic Congo (By Thurston C. Hicks, Hjalmar S. Küehl, Christophe Boesch, Paula Dieguez, Ayuk Emmanuel Ayimisin, Rumen Martin Fernandez, Donatienne Barubiyo Zungawa, Mbangi Kambere, Jeroen Swinkels, Steph B. J. Menken, John Hart, Roger Mundry and Peter Roessingh) |
| Author(s) | McGrew, William C. |
| Citation | Pan Africa News (2019), 26(2): 19-20 |
| Issue Date | 2019-12 |
| URL | http://hdl.handle.net/2433/245545 |
| Right | Copyright © Pan Africa News. |
| Type | Article |
| Textversion | publisher |

Bili-Uéré: A chimpanzee behavioural realm in northern Democratic Republic Congo

By Thurston C. Hicks, Hjalmar S. Küehl, Christophe Boesch, Paula Dieguez, Ayuk Emmanuel Ayimisin, Rumen Martin Fernandez, Donatienne Barubiyo Zungawa, Mbangi Kambere, Jeroen Swinkels, Steph B. J. Menken, John Hart, Roger Mundry and Peter Roessingh

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Research monographs have had a notable impact in the development of studies of wild chimpanzees, from the onset of scientific investigations in the field. (Here, research monograph is defined as a lengthy, inclusive, stand-alone account published in scientific journal format.) Arguably the first proper study of *Pan troglodytes* in nature was by Henry Nissen in western Guinea, almost 90 years ago (Nissen 1931). Later, what could be called the seminal study of modern chimpology, at least in the West, was that of Jane Goodall at Gombe in Tanzania (van Lawick-Goodall 1968). Later still came Kano's (1972) heroic survey of chimpanzees in the greater Ugalla area of western Tanzania. Now comes another ground-breaking monograph, by Cleve Hicks and his team, done in northern Democratic Republic of Congo.

The monograph's title reveals little about its content: On the one hand, the content of the text is focussed and specific, being a detailed ethnographic report of the extractive foraging technology of unhabituated wild chimpanzees. To be even more precise, the two foci are insect-getting tools and percussive food processing. On the other hand, it is unprecedentedly broad, as it compares many groups in an immense range of more than 50,000 km², in northern Democratic Republic of Congo. That country remains little known by chimpologists, although it may be home to more chimpanzees than all the other habitat countries combined! Hicks and Co. report findings gathered over 12 years from 20 surveyed groups, making it perhaps the most wide-ranging such project in chimpological history, dwarfing even the peregrinations of Kano in Tanzania and Zaire (Kano 1984).

Readers may be puzzled by the use of an innovative term, 'realm', in the title. In the *Oxford English Dictionary*, the usual meaning is of a kingdom with a powerful ruler. But used here, it combines two other meanings of the word: A domain of some quality, state, or other abstract conception, plus a primary zoogeographical division of the earth's surface. The former focusses on the concept of culture (and in earlier work, Hicks [2010] characterised it as a 'mega-culture'.) The latter is apt, with a single, key river (the Uele) dividing the cultural realm into moist tropical forest to the south from mosaic savanna woodland to the north. These two areas are further divided into regions.

Methodologically, the monograph is essentially primate archaeology (although that emerging discipline's over-arching framework, presented by Haslam *et al.* 2009, 2017, is never mentioned). Direct behavioural data are few, but instead they come from artefacts, dung, and camera traps. These indicators are collected and analysed precisely, with such standard archaeological techniques such as surface surveying, refitting, sourcing, distance from source to use, etc. Criteria are tight for such perennial challenges as distinguishing artefacts from naturefacts. Problems emerge that are informative, however frustrating, such that tool kits based on artefacts do not neatly correspond to tool kits based on dietary contents of faecal samples. Neither method on its own is enough, so both should be pursued.

Findings on tool-assisted insectivory are both familiar and surprising. Some termite taxa (*e.g.*, *Cubitermes*) are commonly eaten, while others, including the widespread favourite of the apes, *Macrotermes*, are not, except when mating swarms of winged alates are available. So, there is no termite fishing, but percussion is used to process mounds, by pounding chunks on substrates, such as tree trunks or roots. Terrestrial and arboreal honey-producing stingless bees are accessed very differently. Subterranean honey is got by digging stick, while arboreal honey is got by probe. The most commonly eaten ant taxon is none of the usual chimpanzee prey types, but Ponerinae, the predatory, pack-hunting termite-eaters who sting as well as bite. *Dorylus* (army or driver ants) are eaten too, but epigaeic *versus* non-epigaeic taxa call for different tools. All these practices can be classified as habitual, or maybe even customary.

Other types of extractive foraging are tantalisingly tentative: One case of a bark tool used as a trowel to dig up ants. One case of a weaver ant nest being disassembled, leaf by leaf. One case of hard-shelled fruit being used as a hammer to break up termite soil. Two cases of tortoises being pounded open. A 'large number' of terrestrial snails being broken open (but these could be confused with similar processing done by marsh mongooses, as Hicks *et al.* are clear to point out). All these early finds require more evidence, which hopefully will be forthcoming.

More problematic is whether or not any of these results conclusively indicate cultural phenomena. Stark

differences exist between the north *versus* the south side of the Uele, but not all of these could be explained as ecological differences constrained by the very different ecotypes. To get the same prey species, epigaeic *Dorylus*, chimpanzees in the north used extremely long probes, but not so in the south. Without close-up observational data, it cannot be said yet that the variation found results from social learning (in its broadest sense, including not just behaviour, but the products of behaviour, such as artefacts). Thus, when Hicks *et al.* propose a ‘cultural realm’, based on a unique combination of five types of elementary technology, it is still a hypothesis, rather than a solid conclusion. The authors are careful to distinguish between speculation and evidence.

The quality of the illustrations is uncommonly high. There are 54 excellent colour plates, two of which are imaginatively presented arrays of tools collected. (Unfortunately, only six of these photos include scale objects, a simple omission that easily could be remedied.) These photographs depict all the types of elementary technology described in the text.

Of course, there are points of contention: Inexplicably, Japanese contributions to chimpanzee elementary technology are virtually ignored. Of the 91 references listed, only four are to Japanese first-authors, in contrast to six to Boesch alone. There is no place for Uehara or Sugiyama. Equally puzzling is the complete absence of citation of any work by Tutin and Fernandez’s group at Lopé, although done in Central Africa (Gabon), especially on extractive foraging technology (*e.g.*, Tutin *et al.* 1995).

So, what is the verdict overall? A magnificent piece of work, standard-setting in many ways, done in one of Africa’s most challenging countries. One can only hope that Hicks will continue to be financially supported, in order to carry on for decades to come!

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Received: 9 August 2019

Accepted: 16 August 2019