



Naturalist in Review #57 AMONG THE OTHER GREAT LAKES

By Christopher K. Starr

Review of:
Archie Carr 1964. *Ulendo*. New York: Alfred A. Knopf 256 pp.
[57th in a series on "naturalist-in" books; see
www.ckstarr.net/reviews_of_naturalist.htm]

On a topographic map of Africa, you will be struck by a great gash running north-south on the eastern side of the continent. The Rift Valley extends from Ethiopia down to Malawi. Valleys tend to accumulate water, and the Rift has many lakes. These include the African Great Lakes, lying athwart the Equator. I might as well name them, as we are about to become acquainted with two of them. From north to south they are Lakes Turkana, Albert, Edward, Kivu, Victoria (alongside Edward and Kivu), Tanganyika, Rukwa, Mweru and Malawi. In total, the nine have a surface area of almost 160,000 km². Even the smallest of these, Lake Edward, has a surface area of 2325 km², just about half the size of Trinidad. The three largest (Tanganyika, Malawi and Victoria) together contain more than a quarter of the world's fresh water.



African Geographic

Salzburger et al. (2014) provide a convenient introduction to the lakes and their biota. These vary a great deal in their physical properties, for example in depth. With a maximum of 1470 m, Lake Tanganyika is the deepest, while at the other extreme is Lake Rukwa at no more than 14 m (Salzburger et al. 2014: Table 1). At almost 69,000 km² Lake Victoria is the world's second largest lake by surface area (after North America's Lake Superior), but it lies in a shallow depression and so is only the ninth largest by volume. Compare this with Lake Baikal in eastern Siberia, the world's largest lake by volume but only seventh largest by surface area.

Lake Malawi, the subject of *Ulendo*, is the southernmost of the African Great Lakes, lying between the countries of Malawi and Mozambique. At 560 km long, with a maximum width of 75 km and a maximum depth of 706 metres, it is no. 8 by surface area among the world's lakes at almost 30,000 km². It is also known as Lake Nyasa. However, this name is redundant -- like Gobi Desert, Ohio River or Mt Fujiyama -- as *nyasa* means "lake" in Lomwe, a local language. *Ulendo* means "journey" in the same language. Malawi was previously called Nyasaland.



Wikipedia

Archie Carr (1909-1987) was an American field biologist. He is best known today for his central role in promoting the conservation of sea turtles by calling attention to their declining populations and mobilizing efforts to stop the trend (Carr 1967, Davis 2007). He was instrumental in persuading the government of Costa Rica to establish Tortuguero National Park on its Atlantic coast.

His first visit to Africa in 1952 was on a medically-focused collecting trip for the snails that carry the disease schistosomiasis (bilharziasis) and malaria-bearing mosquitos, as well as some other vectors. Subsequent visits focused on the conservation of wildlife.

Carr was the author of three other naturalist-in books: *A Naturalist in Florida* (reviewed as no. 16 in this series) and *The Windward Road and High Jungles and Low* about Central America. *Ulendo* comprises a foreword, two prefaces, eight chapters, two appendices and an index. The appendices, which consist of letters home to his wife, don't really add anything, nor do the frequent flashbacks to his time in Florida and Central America. There are some quite ordinary photos of landscapes and vertebrate animals.

While one would certainly not peg Carr as a medical entomologist, that was his job during his first visit to the area. One necessary part of this was determining the identities and relative abundance of disease-transmitting diseases in the villages. The basic method was first to talk with the chief, who would inform and instruct the people. Then they would select huts for fumigation, seal and fumigate each of them, then open them and collect the mosquitos. I guess that can be interesting enough, especially if it pays the rent.

Much more interesting was a certain non-biting midge, *Chaoborus edulis*, known locally as *kungu*. It was (and is) extremely abundant on the lake. How abundant? The adults fly in masses so large and dense that these can be mistaken for clouds. The first written account of these flies characterized the swarms as like a smoke cloud. Carr called this the most striking thing he saw in Africa and noted that it was not always easy to know what was a mass of midges and what was weather over the lake. At one point he counted

37 such kungu swarms in view at one time.



Imogen Steuart-Fielding

As a biologist, he wondered what caused such swarms? The flies were hugely abundant, but why did they crowd together like that? The obvious hypothesis would seem to be that these were mating swarms, but Carr took quite a different view. He suggested that they served to relieve pressure due to over-population by the suicidal reduction of their numbers down to what the habitat could support. This sounds absurd to us today, but he was writing at a time when the concept of group selection was very much in the air, mainly due to Wynne-Edwards's (1962) well-known book. The basic idea is that very successful populations of organisms have mechanisms to keep their sizes within the environment's carrying capacity, while those that fail to do so go extinct. Within a very few years after Wynne-Edwards's book, group selection was thoroughly discredited, but of course Carr couldn't be aware of that.

The huge swarms of kungu could be a real nuisance if they hung around where people lived or walked, but for the most part they were seen as beneficial. For one thing, the aquatic larvae were a major element in the lake's food chain, thereby supporting the fishes that were important in the people's diet. For another thing, the local people regarded them as a blessing in times of protein shortage. They gathered them in a mass from which they made a kind of bread or sometimes a kind of omelet. His description of this led Carr into a discussion of what appealed to the palates of Africans and Americans.

When we think of east-african wildlife our thoughts turn to lions and other big carnivores, giraffes, and great herds of ungulates. However, the most remarkable of the region's animals must be the fresh-water fishes of the Rift Lakes. These are exceptionally speciose -- almost 2000 known species, about 95% of them found nowhere else -- and show a high degree of single-lake endemism.

Lake Malawi has more native fish species than any other lake, including at least 700 in the family Cichlidae, now very popular aquarium fishes. In comparison, the North-American Great Lakes, with a combined surface area of about 244,000 km², have 176 native fishes with an endemism level of just 3%.



African Cichlid Breeders

This pattern of great diversity and high endemism among the Rift Lake cichlids has elicited much interest among biologists around the twin questions of how such high diversity could arise and be maintained. Variation in physical geographic parameters evidently has much to do with this. In addition, four of the lakes dried out as recently as 15-18 thousand years ago, so that their biota is necessarily very young.

How was it possible for such similar species to coexist? For example, one internet site lists 45 described and several undescribed members of the genus *Placidochromis* in Lake Malawi, all very much alike physically and presumably in their ecological niches. In Carr's view, biologists were not nearly as exercised by this dilemma as they should be. "That unaccountable and unprecedented welter of species in a single body of fresh water is not an easy thought for a biologist to absorb. But once the thought is accepted as reality, it is hard to

escape the feeling that the [Lake Malawi] fishes are one of the truly bizarre anomalies of natural history."

And there is the more general question of speciation, the process by which one species becomes two or three or more. The accepted general rule is that this comes about by way of a geographic separation. That is, populations of a single species become separated through some environmental change, after which they come over time to differ genetically to such an extent that they can no longer interbreed. The barrier separating the populations need not be a major feature of the environment, such as a large river, mountain range or desert, but it must be there.

In at least some of the Rift Lakes, it is believed that alternating wet and dry periods caused episodic habitat fragmentation. In addition, even deep lakes may effectively be fragmented because their deep waters are rendered

inhospitable by being poor in oxygen and food. Furthermore, it is suggested that the surface area or volume of water can be misleading if most fishes stay close to the shore, so that what really matters is the (often fragmented) shoreline. In any event, it seems unlikely that there is a single factor to account for the great diversity in the Rift Lakes cichlids.

Fish were a dietary mainstay for the people around Lake Malawi, and Carr called their fishing “the central focus of native ingenuity”, with descriptions of their techniques and devices. He described the collective landing of a net as a fine drama. Given the central importance of fishes, he found a bewildering multiplicity of local names, and it was often not clear whether two or more names for what appeared to be the same fish in fact referred to more than one species. He attempted to compile a list of local names but finally gave it up as just too confusing, commenting that “The fishes of the lake are an incredibly finely divided spectrum of Life. The plethora of vernacular names corresponds to the real and far greater plethora of species, to an extraordinary abundance of fishes that has no counterpart anywhere else in the world.”

Then there was his focus as a conservationist. One of Carr’s purposes in East Africa was to make better known what was being lost. As he understood, it is a big mistake to think of the natural world as without limits. His first sight of Mozambique, across a river from Malawi, came as a dreadful shock. It was a vast field of maize, which seemed terribly wrong, a symbol of the natural world’s exhaustible character. “So when I came upon the corn in the legendary land, it seemed all at once that the world would never be quite the same again; and sure enough, in a number of saddening ways it never has been.”

Carr regarded the urge to hunt as a natural part of the human makeup, one to which he was not immune. And he was in East Africa, the heartland of big-game hunting. Nowadays we consider big-game hunters as rather pathetic, in contrast to the time a century ago when they were heroic figures. Carr was writing around the time when the old view was giving way to our modern view, and he decided with much reluctance that he

had best suppress the tendency in himself. “The hunting urge is no longer a passion it pays to cultivate [in the modern world].”



Adobe Images

Nonetheless, he was happy to stalk lions and elephants. He gave a gripping account of a lioness stalking and then charging impalas and the impalas’ frantic efforts to escape. And there were big snakes. He recounted a hunt for pythons, remarking that “The noise of a prowling snake is like no other animal sound I know. It is maybe most like the pervading many-footed whisper of army ants advancing.” And there was the really dangerous beast, the Nile crocodile, always to be feared when one went down to the lakeshore to fish. The people came to accept crocodiles as an unavoidable factor, something from which they could not entirely distance themselves.

Carr showed much interest in local customs, some of them quite strange. Wilson, a very able local family servant, took Carr to acquire a genuine ceremonial mask that he must keep hidden so that no woman would see it. It was never plain what harm would come if a woman looked upon the mask, but Wilson made Carr swear to take all necessary precautions against such a calamity.

Watching a group of village boys playing marimbas led to thoughts on the origin(s) of this musical instrument, which Carr was convinced came to Central America from Africa. This is followed by a learned disquisition on the different kinds of wood that go into the marimba. In Central America in the main town square, when a marimba band is in full swing, there comes a time “when the night and the rum and the dark-eyed

girls have made the marimbistas no longer clerks and shoemakers but one many-armed god of the Cakchiqueles, and they send the music out through the *huele de noche* trees in sobs or in paeans as they please.” If you hear it under those circumstances, “You will never again be free of the sound of marimbas.”

Personally, I don’t get it. To me, the marimba is an insignificant, tinkling instrument, not much better than the steel pan and equally ridiculous when played solo. But here, decide for yourselves:

<https://www.youtube.com/watch?v=cKkrXQoIJ58>
https://www.youtube.com/watch?v=Dkn_wtikYIw
https://www.youtube.com/watch?v=mPr_SvnJ_z0
<https://www.youtube.com/watch?v=HIKhmq7RUFi>

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