

## LAKE CHAD: THE DISAPPEARING SAHARA SEA

F. Nigel Hepper

*Formerly The Herbarium, Royal Botanic Gardens, Kew;  
now 25A Montague Road, Richmond TW10 6QW*

Reports of an inland sea in the middle of the Sahara, the largest desert in the world, persisted through the eighteenth century and into the nineteenth century. Could this be true? The secrets of the African interior held tight in spite of several disastrous European expeditions to unravel them, and this lake was one of the mysteries. By about 1820 the British government of the day was concerned to abolish the slave trade wherever it occurred in Africa, and at the same time to open up new territories to trade. So they decided to capitalise on their good relations with the emir of Tripoli who might facilitate an expedition from the Mediterranean coast southwards into the Sahara. (Previous expeditions had been in the reverse direction from the West African coast northwards.) Tripoli was at the northern end of a trans-Saharan route which seemed to lead to this lake known as Tchad—but how could Europeans reach it?

In 1822 the British government sent Hugh Clapperton<sup>1</sup> and Naval Surgeon Walter Oudney<sup>2</sup> to Tripoli, where they were joined by Major Dixon Denham.<sup>3</sup> William Hillman, a shipwright carpenter, also joined them and they all headed southwards in early January 1823, with camels carrying their loads and Arabs guiding their way. It soon became obvious that this was a valley of the shadow of death without food or water. However, they survived the depredations of the desert as well as avoiding Tuareg attacks, until they reached the

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<sup>1</sup>**Hugh Clapperton**, 1788-1827 born in Annan, Dunfriesshire, Scotland, son of a surgeon spent his early years at sea, first as a cabin boy and later he was press-ganged into the Royal Navy where he saw action during the capture of Mauritius from the French in 1810, eventually rising to rank of Commander. He became an important African adventurer who is under-rated nowadays. Clapperton survived his first Sahara journey from Tripoli to Lake Chad, Kano and Sokoto, but was less fortunate on his second visit to Sokoto. In 1825 from the Bight of Benin on the coast he travelled with Richard Lander northwards through forest and savanna to Sokoto, where he died in 1827.

<sup>2</sup>**Walter Oudney**, 1790-1824 born Edinburgh, Naval Surgeon, collected plants (77 specimens from Bornu are preserved in the Natural History Museum) on the expedition to Lake Chad. However, he never settled down to desert exploration and rapidly declined in health, dying at Katagum, in present day Nigeria.

<sup>3</sup>**Dixon Denham**, 1786-1828 born in London, volunteered for service in the British Army and saw service in the Napoleonic wars; later he was promoted to the rank of Lieut.-Colonel. On his return from the Lake Chad expedition with Clapperton and Oudney he became quite a celebrity and he published his narrative. In 1828 Denham was appointed lieutenant-governor of Sierra Leone where he died of malaria.

very shores of the lake some 1900km (c.1200miles) to the south. On 4 February Denham could write purple prose in his journal: "Beyond was an object full of interest to us, and the sight of which conveyed to my mind a sensation so gratifying and inspiring, that it would be difficult in language to convey an idea of its force or pleasure. The great Lake Tchad, glowing with the golden rays of the sun in its strength, appeared to be within a mile of the spot on which we stood. My heart pounded within me at this prospect, for I believed



this lake to be the key to the great objective of our search, and I could not refrain from silently imploring Heaven's continued protection, which had enabled us to proceed so far in health and strength, even to the accomplishment of our task."

Here was a pristine Eden, for the following day Denham wrote: "By sunrise I was on the borders of the lake, armed for the destruction of the multitude of birds, who, all unconscious of my purpose, seemed as if it were to welcome our arrival. Flocks of geese and wild ducks, of a most beautiful plumage, were quietly feeding at within half a pistol shot of where I stood; and not being a very keen or inhuman sportsman, for the term appears to me to be synonymous, my purpose of deadly warfare was almost shaken. As I moved towards them they only changed their places a little to the right or left, and appeared to have no idea of the hostility of my intentions. All was really so new, that I hesitated to abuse the confidence with which they regarded me, and very quietly sat down to contemplate the scene before me. Pelicans, cranes four feet in height, grey, variegated and white, were scarcely so many yards from my side, and a bird between snipe and wood-cock, resembling both and larger than either; immense spoonbills of a snowy whiteness, widgeon, teal, yellow-legged plover, and a hundred species of (to me at least) unknown water fowl,



**Plate 1. Papyrus (*Cyperus papyrus* L.) with mature flower heads and submerged horizontal rhizome which formed rafts of floating islands on Lake Chad.**  
Drawing by F. N. Hepper



**Plate 2. Mission Aviation Fellowship float plane on Lake Chad with pilot Ernie Addicott (left) and Dr David Carling on his medical mission boat. Photo. F. N. Hepper, Nov. 1969**

were sporting before me; and it was long before I could disturb the tranquility of the dwellers on these waters by firing a gun.”

After their parched desert experience it must have been wonderful to see the expanse of the lake and to imbibe the “sweet and pleasant” water. Fish abounded and were there for the taking: “Some thirty or forty women go into the lake, with their wrappers brought up between their legs and tied round their middles, as I should say, by single files and forming a line at some distance in the water fronting the land, for it is very shallow near the edges, and absolutely charged with fish before them so close that they are caught by the hand or leap upon the shore. We purchased some and the best flavoured was a sort of bream.”

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Henry Barth was the next European to cross from Tripoli to Lake Chad in 1851. Based at Kukawa to the west of the lake he rode into the shallows where he met “the Bedduma as they are called by the Kanuri, or Yedina as they call themselves, the famous pirates of the Tsad.” Their wooden boats or canoes were 12feet long, light and narrow each managed by two men, although there were also much larger wooden passenger boats. The water was

fresh and drinkable "as fresh as can be." Barth remarked on the hippos in great number and a couple of crocodiles, but no elephants. The small water-antelopes he saw and locally known as 'kelara' must have been the situngu *Tragelaphus spekei*, which is a rather shy grey-brown antelope living among the aquatic vegetation. Like all travellers to the lake, Barth suffered from hordes of overnight mosquitoes, as well as fleas. Botanically he noted "all around was a forest of reeds of every description, whilst the water itself was covered with water-plants, chiefly the waterlily *Nymphaea lotus*" (Barth 1857).

Sadly his colleague Mr Richardson died and Barth entrusted a local man who was crossing the desert to Tripoli with Richardson's effects, besides his own precious diary. Richardson's death presented another problem in that he was the director of the expedition and alone authorised to act in the name of the British government. Before long the government became anxious about Barth and sent Eduard Vogel and Overweg across the Sahara to find him. They met up but Vogel was murdered at Wara and Overweg died of disease; Barth brought Vogel's dried plant specimens to England and 144 are now in the Natural History Museum and 108 at Kew Herbarium.

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**Plate 3. A papyrous skiff (*kadai*) and our wooden canoe at an island opposite Bol village with the pastor (left) and a couple of local men.  
Photo F.N. Hepper, Nov. 1969**

Towards the end of the nineteenth century the jostling for African territory by European powers split the lake into several unequal parts. The north and east went to Niger and Tchad under French control; the west to Nigeria under Britain and a tiny area to Kamerun under Germany (mandated to France after the Great War). These are now all sovereign republics. But Lake Chad lies in a huge basin in the middle of the Sahara with several rivers feeding into it, so cooperation in the form of a Commission is vital for the inhabitants and long-term future of the lake. Fluctuations of lake level are well documented and ancient shore lines persist. These show that the old Mega-Chad included the Bodélé Depression south of Tibesti and the whole area was about the size of the Caspian Sea! During the first half of the twentieth century the lake covered a much smaller southern area, although it was so shallow that it was likened to a sheet of newspaper with the thickness of an airmail edition equivalent to its depth. The northern part has numerous long narrow sandbanks of flooded sand dunes; a transverse one called Great Barrier sometimes divides the lake into the northern and southern basins. (See the Map)

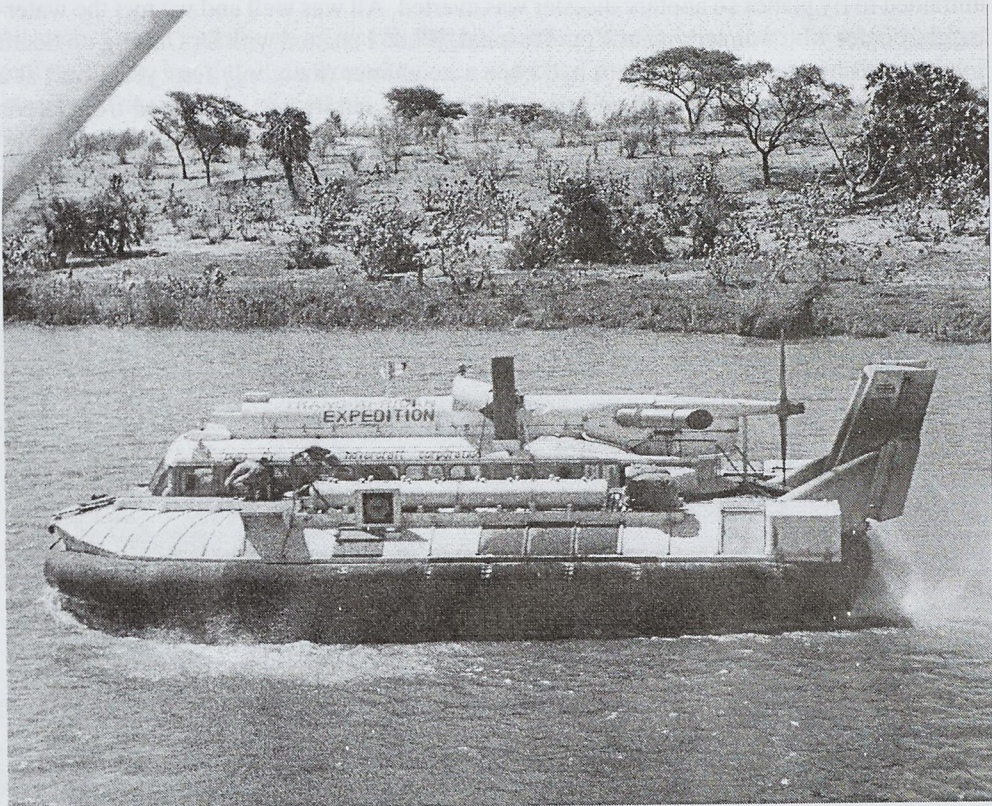
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Plate 4. View across Lake Chad with a floating papyrus island in the distance, and Nigel Hepper standing on a papyrus skiff, ec. 1969.

Thankfully, at the time of my own introduction to Lake Chad in 1969 the relatively high water level united the two basins. I had travelled from Garua to Fort Lamy (now N'djamena) with a few colleagues of the Trans-African Hovercraft Expedition by Land-Rover lent by the British Embassy (Hepper 2006). On arriving at the city I made contact with Monsieur Gaston of the Veterinary Institute who worked on cattle fodder plants. The next day I visited Ernie Addicott, a pilot of the Mission Aviation Fellowship with whom I had previously corresponded. A few minutes later and I should have missed him as he was about to fly to the lake. "Come with me!" he said, and I made one of those decisions in life that can never be repeated. I grabbed some bread and my bag, left a message for my companions and we were airborne on a medical mission.

The huge lake lay gleaming beyond us as we flew northwards over the Shari River. Our task was to link up with a Christian doctor sailing his mobile surgery between the dispensaries



**Plate 5. Trans-African Expedition SRN6 hovercraft, with at water's edge *Vossia* grass and on the sandbank island *Calotropis procera* shrubs, broom-like *Leptadenia pyrotechnica*, spreading *Acacia seyal* trees and several doum palms *Hyphaene thebaica*, Dec. 1969**

on certain inhabited sandbanks. Beyond these islands were floating papyrus islets occupied by Buduma fishing camps. These are the Buduma (strictly Yedina, or incorrectly Yerima) people, the 'pirates of the papyrus' so feared in Clapperton's time. Our flight in 1969 was before the days of GPS, so Ernie had to use dead-reckoning and a sharp pair of eyes to find him. "He ought to be somewhere here", he said. But only wooden canoes and papyrus skiffs were visible—then a gleam of reflected sunlight and an uncharacteristic motor launch 'Albishir' could be distinguished. As we circled overhead waving hands greeted us as the plane prepared to 'land' alongside. At that moment we were aware of a man overboard; Ernie drew to a stop, climbed on to one of the two floats and threw a rope to the man. "He can't swim!" his wife shouted as the man floundered failing to grab the rope. Thankfully, the second throw reached him. "I would have jumped in had you not been aboard," Ernie said afterwards; "the engine was still running and I was afraid the plane might take off if I pushed it." Although I was a Pilot Officer in the RAF, I was a Fighter Controller and untrained to fly planes so another disaster was averted. All was well and we met the waterlogged doctor who was serving at Vom Hospital. When I chatted with Dr Carling on board I was astonished to find that David had been a neighbour (then only four years old) at a bungalow in Hycemoor, West Cumberland, where our family was evacuated from Leeds to our holiday home!



Plate 6. The interior of the SRN6 hovercraft on Lake Chad with Nigel Hepper preparing plant specimens for Kew Herbarium, Dec. 1969



Having handed over the vital medicines we carried, our float plane taxied into open water and we took off for the village of Bol, where such local services as the government of Tchad could muster were concentrated. The float-plane was loaded up with a couple of Bible translators Ernie had come to fetch and I was left standing on the sandbank strip with an assurance that "I'll be back tomorrow". At Bol the French scientific research organisation ORSTOM had a laboratory and a well-equipped boat to study the lake. Also there was the Préfet who was embarrassed by my unannounced arrival. He graciously invited me to dinner of delicious capitaine fish and quizzed me relentlessly in perfect French as I was present long before the hovercraft was scheduled at Bol. He was uncertain whether I was a spy for the insurgents who were mustering for an attack on northern Tchad, he informed me. Fortunately I had a hovercraft motif prepared by our BBC crew which allayed his fears. Next morning the Préfet was astonished when I produced a large franc note to pay for my food and accommodation as in Bol he was used to small change.

All night I slept fitfully warding off flights of mosquitoes and waiting for rebel gunfire getting closer, but day-light brought peace and helpful residents to my aid. There was a friendly African pastor of the little church who played Gospel Recordings to the residents. He arranged for a wooden canoe to ferry me between the islands. This was a marvellous opportunity for intense botanical study and to collect the marsh vegetation surrounding each island. Papyrus (*Cyperus papyrus*) and common Reed (*Phragmites australis*) were the tall



Plate 7. A family of the fishing Buduma (Yedina) people camping among common reeds *Phragmites australis* on an island in Lake Chad, Dec. 1969

dominants, while at the water's edge the grass *Vossia cuspidata*, spread across the water surface. The plants of the dry sandy island were totally different; everywhere the hooked seeds of the weedy cram-cram grass (*Cenchrus biflorus*) made walking painful; the prickly *Acacia seyal* trees and tall doum palms (*Hyphaene thebaica*) were scattered in the centre.

The following day we continued collecting around another island and when I heard the plane's engine and saw Ernie land again. I felt like a ship-wrecked mariner sighting a rescue ship. Back at Fort Lamy there was bad news of the SRN6 Hovercraft which had crashed into a tree beside the River Logone on the way from Yagoua. Its propeller was twisted and the skirt so punctured that the supporting air cushion was reduced. This slowed its progress to Fort Lamy where the President of Tchad had awaited its arrival, little realising the predicament the Expedition was now in. Clearly we could not travel over the lake until the hovercraft was repaired. As it would take a fortnight to fly out a new propeller and plenum from UK, this gave me an opportunity to go to Central African Republic sooner than expected. This was a fascinating botanising trip in the tropical forests occupied by the pygmy people who lived in domed huts made of palm fronds.

Returning to Fort Lamy I was in time for the expedition's move to Djimtilo at the margin of the lake. One night, camping under the stars, I watched a Russian sputnik sail overhead. Next day we were able to 'sail' across the choppy surface of the southern part of the lake not far from the eroded volcanic towers of Hadjer el Hamis, the only rock in the area and a useful land mark for vessels. Here, in the extensive grassy swamps, we had the privilege of spotting a couple of sitatunga, the water-antelope recorded by Barth. I was able to collect the aquatics *Potamogeton schweinfurthii* and *Ceratophyllum demersum* by leaning over the hovercraft's edge with someone holding on to my shorts - this came out on the TV film commentary as: "Nigel Hepper says that the ecology of Lake Chad is in a delicate state of balance." Not only the ecology! When I gingerly explored a floating papyrus island in deeper water, I took the precaution to tie myself to a life-line as I was out of sight and likely to meet a hippo head on. My feet went right through the the raft of rhizomes and the rope became untied—quite dramatic for the BBC who filmed every move.

A couple of Buduma fishermen in a canoe pulling in their nets were not at all pleased to see us until we explained our purpose. Traditionally these fishermen used a bundle of ambach stems as personal floats to paddle out to their lines. Ambach (*Aeschynomene elephroxylon*) has swollen stem containing large air pockets; it is a tall legume that grows with papyrus in shallow water. Other islands were uninhabited sandbanks sometimes a kilometre long but only 30m across, with huge cattle and even the occasional elephant. Apparently groups of elephants wander on to the islands during low water and sometimes become marooned during the rainy season when the Shari/Logone rivers replenish evaporated water. The MAF float plane was hired by our expedition to find some, report back by radio and to direct our hovercraft to the island.



**Plate 8. Aerial view of Lake Chad islands as seen from an airliner heading for Europe, showing the village of Bol (centre), the dark polder area and the causeway linking the sand banks with northern Tchad Republic. Photo. F. N. Hepper, Dec.1969**

The northern basin of the lake could be reached at that time over the flooded Great Barrier. At a fisherman's island I was able to pole a papyrus skiff called a kadai. It floated low in the water which came oozing between the stalks and around my ankles when two or three people were aboard. Kadai are like those depicted in Tutankamun's tomb in Egypt where papyrus boats of all sizes were made and used. (In 1970 Thor Heyerdahl hired Bol workers to make his trans-Atlantic papyrus ship *Ra II*, as the Egyptian-made *Ra I* had been unseaworthy.) Then we entered the Nigerian area of the lake to the village of Baga on the west coast where we rendez-voused with Sylvia Sikes, a redoubtable zoologist studying the African elephant and who has written the most comprehensive work on Lake Chad (Sikes 1972, 2003)

Returning to Bol, this time as part of the official team, we were welcomed to Lake Chad with 30 resplendent horsemen lined up bearing unsheathed swords and swaying to the loud drumming and pipes. At a given command pairs of horsemen charged in succession and drew up abruptly in a haze of dust, like an Indian durbar.

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That was about thirty eight years ago and since then the lake has virtually disappeared. The impact on the wildlife must be immense and a fraction of what it was. In 1823 Denham had described Lake Chad as an ornithological paradise. Hilary Fry, the ornithologist on our expedition, had found the birdlife was still extraordinarily rich in 1967 and 1968. Based at Malamfatori, he had recorded over 300 species there and had estimated there were probably another 100 species across the Lake. They included twelve species of heron, four spoonbill, and seven stork species. Fry mentioned that there are two distinct avifaunas at Lake Chad: the resident African and, from September to May, the Palearctic. The latter arrive in waves from Europe and Asia across the desert "at an abundance of about 2,500,000 per ten kilometres." For example: "Making independent and complementary counts of roosting flights of ruffs across the shoreline in the evenings, we were obliged to reckon in tens of thousands and estimated 500,000 in one area, with the probability of more than a million within a twenty-five kilometre radius of the mouth of the Yobe." (Fry 1970). Similarly the sand-martins "exceeded 100,000 birds per hour, and at least a million were probably involved altogether. They were mostly from the European area of their breeding range... Again yellow wagtails were in great profusion, with roosting flights of 4000 per minute." It was a great privilege for me to have witnessed some of these mass migrations during our expedition in 1969. From retrieved ringed birds Fry concluded that "with certainty the breeding populations of Britain, Central Europe, Scandinavia, the Iberian Peninsula, Italy, the Middle East, Turkistan, and the Kirghiz Steppes winter in the Chad basin". No wonder many of these species have become uncommon in northern climes now that the waders' wintering grounds have dried out.

Sylvia Sikes returned to Lake Chad in 2002 and her story makes for sad reading (Sikes

2003; see also Batello 2004). The Great Barrier is exposed and the north basin has dried up. Little open water remains even in the south basin and this is crammed with imprisoned fish which are being caught by many in-coming people. Regrettably, the Yedinas have virtually lost their identity, and there is hardly any papyrus left. Cultivation of the exposed lake bottom yields a good harvest of vegetables and subsistence crops, but for how long? The Shari's flow is insufficient to replace evaporation to replenish the lake and no other river can do it. Is this another manifestation of global warming and climate change?

**Correction:** Caption of Fig. 9 in *Nigerian Field* 71:33 (2006) to read: Len Beer plant collecting for Kew Herbarium among *Euphorbia* bushes near Rhumsiki. Photo. F.N.Hepper, Nov.1969.

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