

# On the Tuareg Trail



**Navigation is both a science and an art. The science can be as simple as a hand-drawn map, or as clever as a state-of-the-art navigation receiver supported by billions of dollarsworth of floating space hardware. But the art of navigation goes beyond technology - it's about knowing things, or being able to deduce things from your environment, that help you get to your intended destination. This is 'natural' navigation, and when given the chance to go to the Sahara, to learn how the Tuareg naturally navigate through their own uniquely challenging environment, Tristan Gooley jumped at the chance ...**

**I**t was hard to have realistic expectations. My research had failed to uncover anyone else who had ever headed into the Sahara with the aim of learning how the Tuareg navigate in the desert. As such, my Libyan trip in February and March of 2009 promised much, but without any clear precedent, it was hard to know exactly what it might deliver.

## Beyond Google

My aims were actually two-fold; to learn more about Tuareg methods and to test my own natural navigation abilities in the desert. This was literally uncharted territory for me; the maps that I had managed to get hold of just had large blank spaces. The Libyan/Algerian border area of the Fezzan desert is the first part of the world that I have travelled to that does not meaningfully exist on the internet, and as it turned out, very little of my time in the desert was spent in places that can be found with a Google search. That was refreshing!

As the aircraft descended towards Tripoli I noticed the sets of swell in the southern Mediterranean marching to the east-southeast. These waves were bent as they refracted around the headlands along the Libyan coastline. The patterns are much easier to spot from a few thousand feet than they are from a canoe, the way the Pacific Islanders have learned to do it over the centuries. The wind that had created this swell is such an important piece of the natural navigation jigsaw and I was happy to note its effects in the combing of the palm trees as the aircraft began its final approach.

I was met at the airport. Nobody travels independently in Libya these days - Colonel Gaddafi forbids it. My driver told me that independent travel used to be allowed, but some tourists had damaged some rock art and so it was now forbidden. This did not need to be a negative for me as I planned to gently interrogate the Tuareg while there, so I just did my best to make sure that if I was going to be escorted, it would be by the Tuareg themselves.

My immersion into the desert happened in stages. There was time for a quick circuit of Tripoli. Some navigational clues here included the niche in the wall of the mosque, 'al Qiblah,' indicating the direction of Mecca, and the paint peeling on the southern side of the minaret tower, but not on any other side (Tripoli is north of the Tropic of Cancer and so the fierce midday sun is always due south).

Muhammed, my Tuareg guide, took some convincing that I was genuinely more

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interested in discussing Tuareg wayfinding than I was in chatting about the Roman era in Libya, but he finally succumbed. He talked about the use of the Sun, the importance of smell - especially of camp fires - and how moonlight is a better bet than torchlight for

finding your way at night. He also explained that he had watched GPS users get lost in the desert frequently, particularly at night because even though their technology tells them they are back at their starting point, light levels have changed subtly and the desert no longer looks familiar, so they begin to doubt their instruments - a recurrent navigational problem that aviators are trained to guard against.

### The Man Who Owns A Goat

The next stage was a domestic night flight to Sebha, where Muhammed handed me over to Amgar. He was dressed traditionally and looked ill at ease in an airport. We drove to a staging camp for many Fezzan desert expeditions. Amgar looked at me with concern as I excitedly peered up through the windscreen at Canopus, the second brightest star in the night sky - exciting because it is not visible from northern European latitudes. At the camp we ate in near silence. I noticed a ring on Amgar's finger and tried to break the silence.

'You are married?'

'Yes. Oh, yes.'

'I am too. I have two young boys.'

'Yes. Ten.' He held up the fingers from both hands. 'Seven boys, three girls.'

'Wow,' I said.

'Yes. Ten children. Two wives.'

We both fell silent again. Communication was going to turn out to be a struggle for the duration. During that first basic meal I learnt that Amgar's English was near non-existent and confirmed that my Tuareg and Arabic were equally weak. We spoke mostly in French, at which it transpired that neither of us were brilliant either. Amgar was ecstatic on discovering that my surname was Gooley. Apparently a 'Gooley (my spelling) is a solid Tuareg name, meaning he who owns a goat, camel or cow.

We loaded up a 4x4 pick-up truck with hundreds of litres of water and got ready for the next stage, a drive into the desert proper. I noted that the palms had been blown by a southerly wind, but there were other conflicting wind signs. A dominant, prevailing wind had not imposed itself. This reinforced some of the research I had done on wind trends in Libya before the trip.

### A Curious Specimen

The road took us west; it was in decent metalled condition initially, a bit rough in places, but better than I expected. Every few hundred meters there was the black husk of a blown-out tyre, evidence that this was a harsh environment for wheels, but also that we were beyond the point where there is any infrastructure: nothing gets tidied up. The

first dunes popped over the horizon. They grew in size as we passed the Ubari Sand Sea region to the north of the road. We stopped for Amgar to talk to a friend who had broken down - in these vast empty plains the world becomes a smaller place, socially at least. While they chatted amicably in Tuareg, I noticed that the sand on each side of the road was a different colour. The sand on the northern side appeared redder. I asked Amgar about this, who, not for the first or last time made facial expressions to the effect that he thought I was a curious specimen. He shrugged his shoulders, but thought it might be the wind. This was what I believed. The road was acting as a barrier to the wind's air flow and separating the heavier particles from the lighter, in effect filtering it by colour and so leaving a basic sand colour compass.

We passed a complex dune system to the south. Being familiar with R. A. Bagnold's classic, *The Physics of Blown Sand and Desert Dunes*, I was eager to further my understanding of the relationship between prevailing winds and dune formation. After pausing for lunch and then tea with Amgar's family in a basic desert dwelling near the small town of Al Aweinat, we swapped cars for a Toyota Landcruiser and ventured off-road. Amgar's friend dropped us off and we watched the dust trail disappear behind us. We were not to see another vehicle, building or any sign of civilisation for another eight days. The bustle of the camp-making routine began, but not before some strong tea.



Which way is my dune running?

### Shrugging Off Venus

The first night in the desert we were joined by Khadiro, another Tuareg who arrived on one camel and brought two others. The camels would earn their keep under hundreds of kilograms of kit, food and water over the coming days. That night brought a surprise too. We were all tired after a long day, but a couple of slurps of incredibly strong and sweet green tea later, all three of us perked up. The temperature dropped fast with the

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Sun, which had set just to the south of west. The angle at which the Sun descends at lower latitudes meant that stars were out soon. I began to ask Amgar about them. He seemed uncomfortable. I did not relent and after learning the Tuareg and Arabic words for a star, I pointed to Venus and asked him about that. He repeated the words for star. I could not believe it. I had arrived in Libya with the intention of learning, among other things, the astronavigation methods of the Tuareg. It had never occurred to me that a genuine Tuareg, who came from a nomadic community and had lived as a nomad for much of his life, might be unaware that Venus was not the same thing as the stars that filled the sky. It is true that it has been known as variations of a morning or evening star by many cultures, but after much careful discussion, albeit in stilted language, it was confirmed that neither Tuareg men were aware that the bright object in the western sky was a very different beast to the other pinpricks of light. A real shock.

We walked for hours the following day and I began to test myself. My method was simple: I switched on a handheld GPS before setting off in the morning and logged our start position. I then switched it off and put it with the other back-up kit, including a compass, satellite telephone and emergency radio beacon. At lunchtime, I combined my estimation of distance travelled with direction gleaned from using the Sun, wind, clouds and occasional trees. I estimated my new position and then switched on the GPS and compared the two. This is the method I repeated over eight days, morning and afternoon, during which we covered over 150 km - some, but by no means all of it in a straight line. Predictably, my estimates were never perfect, but neither were there any gross errors. If you estimate your walking speed as 5 km per hour then after five hours' walking you can

in theory be anywhere in a circle of nearly 2000 square kilometers. I was never more than 4 km from my estimated position and twice within 750 m. I should add that these were not calm, sterile laboratory methods or conditions. During the eight days of testing I was contending with temperatures that went from near freezing to predictably boiling, I was carrying weight across often testing terrain, including vast dune systems, and conducting constant informal interviews. We also spent twenty-four hours battling a sandstorm.

### The Generation Gap

Through endless challenging conversations with Amgar and Khadiro, the navigation methods they used became clear. Firstly they were both day travellers and night movement was to be avoided at all costs, hence their ignorance of the stars. This must be a recent and not universal shift as I have come across plenty of Bedouin references to the stars being used for navigation and the two cultures are not isolated. I came to believe that this ignorance of the stars was a very recent phenomenon. Amgar repeatedly

referred to ‘Old Tuareg’ as opposed to ‘New Tuareg’ and implied that there was a big difference between his father’s generation’s understanding of the night sky and his own. I did persuade them to extend one night walk, when we had set out to find an errant camel. We walked under a five-day-old moon with Sirius, Canopus, Capella, Spica and Polaris all easy to find and Saturn visible below Leo in the east. I think they started to find my interest in the stars irritating and so gave me a five minute headstart for a race back to the

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top of a huge dune system. I beat them, just, but it was a long time before the freezing air allowed the copious sweat and sand mix to chill.

The Tuareg rely heavily on the most prevalent of global navigation methods: landmark recognition. They have learned to read what appear to the foreigner as

featureless plains in the same way that we come to recognise our own home environments, albeit swapping shifts in relief, rock and sand colour for road signs etc. They also use the Sun, although if they are passing through familiar terrain then it is only in a casual way.

### Who Needs North?

They keep a mental log of position that is much more finely tuned than most Westerners’; this was the most interesting and unusual approach. If I asked Amgar which way was north, he would invariably frown and curtly explain that he neither knew nor cared. If I asked him the direction of Mecca he could always point accurately. He could also always point in the direction of certain villages and towns, even if they were 100 kilometers away. It became clear over several days that Amgar was ‘logging’ his position by constantly and probably subconsciously updating these bearings. (Interestingly this is a very similar method, albeit in a very different and drier environment, to the one honed over hundreds of years in the Pacific Micronesian islands, a method known as ‘Etak’). My guess is that



this is a method borne of needing to know which way to head if things start going wrong in the desert.

I was also able to add a few methods from my own observations. One example being the different behaviour of the winds of sandstorms and the prevailing winds, that lead to different clues in certain places. The sand that accumulated in the lee of trees indicating a different direction to the prevailing wind that was combing that same tree, for example.

The weathering of large rocks that leads to formations, like 'yardangs,' has been documented elsewhere, but I found this weathering effect could be used on the smallest of rocks at times, especially on exposed summits.

### Riddle Me This...

Reading the sand dunes was a lot harder than I had hoped or anticipated. In places where there are not very dominant prevailing winds, the resulting complex dunes are very hard to fathom. They did however help as vast landmarks, visible for whole days at a time.

There were a few riddles that I am still puzzling over. The wind direction did not seem to have nearly as strong a relationship with cloud movement as it does in most other parts of the world that I have visited. On one occasion, the lower clouds were moving in the opposite direction to the wind I could feel on my face. A difference of 45 degrees is common, particularly in undulating terrain, but a 180 degree difference on a flat plain is definitely not. I can only assume some form of very low local anabatic or katabatic wind off a nearby dune system.

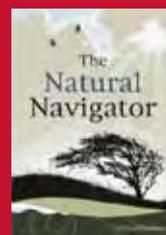
Despite the physical and cultural challenges it proved to be a hugely rewarding research trip. I learned vast amounts from my new Tuareg friends, most of it navigation, but some of it more philosophical:

*'In the Sabara... there is no time.'*

It was great to test some theoretical desert methods in the harsh environment itself. The desert, although a testing place physically is a welcoming and friendly place for natural navigation. The Sun and stars do not hide very often and visibility is great, sandstorms permitting.

The friendship and trust was deep by the end of the trip, and the stilted communication ran to a series of compliments. Amgar asked me to teach him how to find Mecca using the stars, I asked him to share his method for making a tumbler of tea that would be a Class A drug in this country. During our final hour of walking together, Amgar paid me the biggest compliment: 'Some people say they like to walk. But they do not.' He paused. 'You like to walk.' The socks that were stiff with dried blood would have liked that.

We made our final camp. Venus set behind our camels in the west, as Cassiopeia reliably pointed the way to Polaris in the north. The following morning Jupiter rose before the Sun in the east and the dust of a Landcruiser appeared on the horizon. I did my best to show my gratitude for my desert experience by kissing Amgar goodbye at the airport. After all, when in Rome ...



### The Natural Navigator

Tristan Gooley is the founder of the UK's first and only natural navigation school, [www.naturalnavigator.com](http://www.naturalnavigator.com). His book, *The Natural Navigator*, has just been published by Virgin Books. We have five copies to give

away to the first five people to correctly answer the following question:

**When viewed from Tripoli, what direction will the Sun be when it is highest in the sky on the 20 December?**

Send your answers to the Editor at:  
RIN, 1, Kensington Gore, London SW7 2AT  
or email: [editor@rin.org.uk](mailto:editor@rin.org.uk).