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Exploring Time

"In any field, find the strangest thing and then explore it."

J. A. Wheeler



John Harrison (1693–1776)
and the H4 timekeeper



Larcum Kendall (1721–1795)



Discovery 1778 -
Captain James Cook and the peoples of the Pacific.

"Pocket Chronometer with "Z" balance"
Thomas Earnshaw, *Invenit et Fecit*, No. 429 of the sort/2660. Case by Thomas Carpenter with London hallmarks for 1800. Gold pair-cased pocket chronometer with Earnshaw's spring detent escapement and Earnshaw's "Z" compensation balance.

Whilst the role of timekeeping in the exploration of the oceans has been well covered, as has its role in both aerial and space navigation, somehow its place in the history of terrestrial exploration seems to have been overlooked; in this short article I will try to correct this oversight.

Everyone knows the phrase "Doctor Livingstone, I presume?" spoken by H M Stanley, when he finally encountered the explorer, who had been presumed lost for seven years. But no-one asks the question, how does an explorer get lost? And especially, more than a century after John Harrison had solved the 'Longitude Problem' enabling sailors to find their position anywhere at sea. So why couldn't terrestrial explorers, who by this time were thrusting deep into previously unexplored interiors, use the same technology?

The principle of longitude is quite simple, if two points on the earth's surface are 15° apart in longitude, then there is

one hour difference between them. So, if you know the time at a fixed point (usually your starting point) and the time where you are now, you subtract one from the other & the time difference will give you your longitude.

At this point it is necessary to look back to the introduction of the marine chronometer, although Harrison's final chronometer (H4) and the two subsequent copies by Larcum Kendall (K1 & K2) were essentially oversized pocket watches; the developments by Earnshaw, which improved both the accuracy and ease of manufacture, also had the side effect of making the chronometer useless anywhere other than on a ship. Earnshaw's detent escapement, perhaps his greatest invention, was a masterpiece of manufacture but an unfortunate consequence was its delicacy. Our whole idea of a chronometer is a clock suspended on gimbals inside a wooden box with a glazed lid, but the reason for box & the gimbals is to provide protection & stability to the delicate instrument inside.





It may seem that the constantly rolling motion of a small wooden ship in the middle of an ocean could not be a more dangerous or unstable place than a jungle or mountaintop, but the truth is far from it. If we look at how they were used, then it is easy to understand their unsuitability for land exploration. The chronometer was always kept in the Captain's cabin, which was well below decks and therefore less subject to the rolling motions, it was also the one area of the ship that was usually heated and, crucially, it never left this safe and secure environment. When it was necessary to know the time on deck, when the ship's position was being fixed, a small watch would be brought to the captain's cabin and set to the exact time on the chronometer. This watch would then be taken on deck and used to record the time. The chronometer itself was never moved.

In the 18th century, the chronometer was perhaps the most precise and delicate instrument that mankind had ever produced, and (expressed in a price to weight ratio) one of the most valuable.

The average chronometer cost about one third of the cost of the ship in which it sailed.

So, as I hope I have shown, it is easy to see why the marine chronometer was totally unsuitable for land exploration; and why it took another hundred years after John Harrison's breakthrough before there was an equivalent terrestrial timepiece.

Up until the early 19th century, most exploration had been independent and (usually) commercially driven; but by the mid century, the great European nations attempted to build colonial empires. Britain, France, Germany & Belgium all competed in the rush to colonise the 'unexplored' corners of the world; the impetus no longer was for trade in spices and silks but rather the glory of Empire.

As I am British I shall choose to concentrate on British explorers, their timepieces and how they used them and I hope that others will follow and tell the story of explorers from other nations.

The Halley Expedition



THE EXPLORER

To the International Geophysical Year, Rolex makes important contributions. For example, Rolex is timing the intensive explorations of the universe by the Royal Society of London, world's senior scientific body. Rolex watches are always found where frontiers are being advanced.

Rolex EXPLORER, Oyster Perpetual waterproof, self-winding, 25 jewel officially certified chronometer movement. Luminous dial, sweep second hand, hour-plate, super-antimagnetic. Oyster case with sapphire crystal. Price: \$185 US \$175. Request extra 40% for special label on this model.


ROLEX
OYSTER PERPETUAL



JEWELER'S NAME AND ADDRESS

The Royal Society (or, to give it its full name, 'The Royal Society of London for Improving Natural Knowledge') was founded over 350 years ago as the first scientific academy in Britain. Its work in exploring science went hand in hand with exploring the world we live in, as early as 1769 the Society funded Captain Cook's voyage to Tahiti to observe the transit of Venus (an expedition which Cook was able to navigate perfectly because he had with him Larcum Kendall's K1). Almost two hundred years later, the Royal Society funded the setting up of the Halley base in Antarctica during the International Geophysical Year (1956/1957) and for this expedition they were supplied by Rolex with recently introduced Explorer watch.

But the main organization funding British exploration during the Victorian era was The Royal Geographical Society. Founded in 1830, it sponsored the travels of such luminaries as Livingstone, Stanley, Scott, Shackleton, Hunt and Hillary. And it was under the auspices of the RGS that much of what became the British Empire was

mapped and claimed for the crown. These were the men for whom a number of British watchmakers developed the "expedition watch"; initially these were normal pocket watches but with screwed bezels and backs which had grooves where greased leather seals could be fitted (fig a).

Later, when stem winding and setting became the norm, it was now necessary to find a way to protect this very vulnerable component. This led to the introduction of the screwed cap which covered the entire stem & tube (fig b).

Due to the austere economic conditions in Britain, following the end of WW2, the import of Swiss watches (along with most other 'luxury' goods) was prohibited until 1950. To announce their return to their original market (the company was founded in London in 1905), Rolex decided to supply the Royal Geographical Society with watches for their expeditions and also to provide some financial support. This support most notably bore fruit when Tensing Norgay stood at the summit of Everest in 1953 with a Rolex on his wrist.



The expedition's leader Col. John Hunt also wore one throughout the entire venture and was fulsome in his praise for its performance, saying "They performed splendidly and we have come to look upon Rolex Oysters as an important part of high climbing equipment".

The RGS also provided help and support to expeditions which were independent of the society but where the aims of the expedition were in alignment with that of the society, so, in 1955/6 (as another facet of IGY) a small expedition from Cambridge University set out to survey one of the loneliest places on the planet; Gough Island, a dot in the South Atlantic.

The eleven members of the Gough Island Scientific Survey spent over six months recording details of the island's geological history and its flora and fauna. As I said before, the island is a dot in the farthest reaches of the South Atlantic and this expedition would be a footnote in the story of the International Geophysical Year if it were not for one small detail. One of the watches used by the expedition has recently surfaced; and, like many of the watches made by Rolex in the 1950s, it poses more questions than it answers. These watches were given by the society to the members of expeditions and it seems that they were not expected to be returned on the completion of the expedition, as the case backs are engraved with the title of the expedition (which makes it impossible for them to be re-used). This watch was given to Nigel Wace, a 26 year old botanist at Oxford; who, in later life, became the leading authority on the plant life of Gough Island and the other three Tristan de Cunha islands when he became head of the department of Biogeography and at the National University of Australia.

What makes this watch unusual is that it is a reference 6098, not the normal 6150 reference seen on early Explorers; it also has the last 3 numbers of the serial number engraved inside the case back; this is usually seen on watches such as the British Military Submariners and the Comex watches. The common feature amongst all these watches is that they have engraved backs; the purpose of the serial number inside the case back is to ensure that case backs were not mixed up when they were sent out for engraving. This, almost certainly, means that the case back engraving of the expedition's name was done by Rolex, not by the society.

Rolex obviously realised the value of the public's identification between the company and exploration, as they continued to sponsor individual adventurers worldwide, featuring the climber Reinhold Messner (the first man to climb



Caption ??





Caption ??



"Luminor Arktos"
 Officine Panerai, Firenze 1860, "Luminor - Arktos", Ref. OP 6559. Made in 2004 to celebrate the Mike Horn "Arktos" expedition. Self-winding, anti-magnetic, water-resistant, stainless steel "Expedition" wristwatch with date and cardinal point bezel.

Everest without oxygen) in their advertisements during the 1970s & 1980s. Although Messner wore the Rolex Explorer II on most of his climbs, the company chose him to advertise their newly introduced model, the Oysterquartz, and it is this watch which features in most of the advertisements he made for the company.

However, some explorers chose the Oysterquartz for its increased accuracy, and one of those was Wally Herbert (who also featured in many 1970s Rolex advertisements), who wore an Oysterquartz during his 1971 expedition to northern Greenland where he made a famous film on the life of the Polar Eskimos and during his 1979 circumnavigation of Greenland.

As late as 1986, Rolex were still supplying watches to expeditions, providing early models of the new 16550 Explorer II to members of Will Steger's six-man team, who made the first recorded unsupported dog sled expedition to the North Pole.

Other watch companies saw the success of Rolex in this area and many have since followed, perhaps none more so than Panerai, who were not only a sponsor of Mike Horn's 2002 walk to the North Pole, but actually designed a special watch for him and his colleague. The usual elapsed time bezel was replaced by one with the four cardinal compass points, enabling the wearer to orient himself with the North by simple sun sighting. Two years later they launched a replica of that special watch on the market under the name 'Arktos'.

In 1983, after the shooting down of Korean Air Lines 007 by the Soviet Air Force, President Reagan authorised the US military to allow civil use of the five year old Global Positioning Satellite system. With the widespread use of GPS nowadays, it would seem that the time for travellers (let alone explorers) to need a precise timepiece is now over. This is far from the truth, as the operation of the GPS system is only possible because each satellite contains one of the most accurate timepieces in the world, a caesium atomic clock with an accuracy of 2 ? 10⁻¹³ (one in five trillion). So, whether it is on the dashboard of your car or on your wrist, nowadays, no one is without the precise time of explorers.

Suggested reading

M. Holdgate: "Mountains in the Sea: the story of the Gough Island Expedition", 1958

W Andrewes (ed): "The Quest for Longitude; the proceedings of the Longitude symposium", 1996