

## THE SCIENTIFIC RESULTS OF THE D'ENTRECASTEAUX VOYAGE IN VAN DIEMEN'S LAND, 1792-93

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**ABSTRACT:** The achievements of D'Entrecasteaux expedition in Van Diemen's Land were substantial and followed by further, more extensive investigations by Nicolas Baudin ten years later. To this day, French marine science and exploration is conducted in the Pacific as well as Tasmania waters, on research vessels whose home port is Brest.

**KEYWORDS :** Pacific Ocean; Tasmania; Oceania; northeast Asia; northwestern America; voyages of discovery; voyages of exploration; Age of Enlightenment; La Pérouse; Cook; D'Entrecasteaux.

Before leaving Sydney in March 1788, La Pérouse entrusted despatches outlining his intended route, visiting the Solomon islands, New Caledonia and other locations with a Lieutenant John Shortland who was due to return to Britain in July. La Pérouse also said that he hoped to reach Isle-de-France, present day Mauritius, by December 1788. When he had not arrived by then and nothing was heard during the next year, Bosc d'Antic, a naturalist who was a member of the National Assembly presented a petition on behalf of the Société d'Histoire Naturelle requesting that an expedition be sent to search for La Pérouse. Three months later the Assembly ordered the expedition in the name of a king who by this stage was a virtual prisoner, for this was eighteen months after the storming of the Bastille (Horner, 1996).

The expedition was one of the largest voyages of exploration mounted by the French and even though it was to search for La Pérouse it was also a scientific expedition. Having proposed the expedition, the Société d'Histoire Naturelle continued the role of sponsor and made the decisions on what research was to be conducted. The French attitude towards science differed markedly to that of the British. French explorers in the Pacific were given specific directions where it was left to individuals on British voyages to pursue scientific interests.

Commissioning the ships for the expedition was slow. It took another eight months after the Assembly's approval before it departed. The two vessels chosen were the *Truite*, renamed *Recherche*, the leading vessel under the command of Bruny d'Entrecasteaux and the *Durance*, renamed *l'Espérance* under the command of Jean-Michel Huon de Kermadec. D'Entrecasteaux selected eight naturalists from a list supplied by the Société and assigned five to *Recherche* and three to *l'Espérance*. In choosing scientists for the expedition the Société gave preference to those who had broad experience and were not restricted to one discipline. In addition there were three naval men who were mostly

concerned with the scientific work. One of these, E.P.E. de Rossel was put in charge of the astronomical work at which he was highly successful.

The most prominent of the naturalists were Labillardière, an established botanist, and Claude-Antoine Gaspard Riche who carried out research on a wide variety of subjects, including measurements of wind direction, turbulence in the upper air using hot air balloons, temperature at great depth and measurement of the salt content of sea water and its density, as well as marine phosphorescence. Regrettably, apart from his meteorological journal, none of his results survived, a general problem with the expedition, largely as a result of its disintegration in the Dutch East Indies. Labillardière was already well-travelled and experienced as a field botanist. His travels included France and Italy, as well as the Middle East, mainly Syria and Lebanon and after the latter trip he published a systematic botanical work on the region's flora. His first overseas trip had been to Britain where he met and befriended Sir Joseph Banks, an association that later enabled him to retrieve the botanical specimens he had collected on the d'Entrecasteaux expedition. The collections from the expedition had fallen into British hands.

For a marine expedition in this period in vessels of approximately of 350 tons and 112 and 114 ft long (Horner p. 26), carrying supplies and equipment for a voyage of some years and with a total complement of 222 (Horner p 45) there were severe restrictions on the amount of preserving fluid and the size of containers that could be taken for biological specimens. There were only a few small specimens in fluid which finally reached France, although this was probably as much to do with the way the expedition finished. Some types of zoological material were easy to collect and store, including shells, insects, dried skeletons of echinoderms and similar forms, as well as the skulls and bones of vertebrate animals (Plomley, 1993, p. 23). It was not until about 1800 when it was realised how arsenic could be used as a preservative that arsenical soaps were applied to preserve the original shape of the skins of birds and mammals. Brian Plomley who co-authored a biography on d'Entrecasteaux says: "It was from this time that zoology came into its own as a science". Botanical science was not held back in this way for dried herbarium specimens were easily prepared in the field.

Unlike the preparation for the La Pérouse expedition, where the scientists had acted independently, the d'Entrecasteaux expedition provided basic scientific equipment, supplies and a library for each ship. The naturalists supplemented this with materials and books to suit their own requirements.

In a short paper such as this there is not enough time to discuss the expedition in any detail, but I would at least like to talk about the time spent in Van Diemen's Land and summarise the reasons for the collapse of the expedition.

D'Entrecasteaux had intended making landfall in Adventure Bay when the ships arrived in Van Diemen's Land, an anchorage used previously by Furneaux, Cook and Bligh. A mistake in taking bearings based on a rough map from Bligh led to *Recherche* entering a

bay which was subsequently named after the ship: Recherche Bay. Having decided that the Bay was an ideal anchorage, affording protection from the wind and with a freshwater stream, the ships' boats were despatched beyond the Bay. The hydrographer Beautemps-Beaupré had his first opportunity to use his innovative cartographic technique on an unknown coast. He used astronomical, instead of terrestrial bearings as a base for observing landmarks. These were done with a reflecting circle instead of a compass, measuring the angular bearing of each landmark from his base observation. "He repeated these landmark bearings from other vantage points to provide a framework of triangles to 'control' the area to be sounded". (Horner p. 71) Beautemps-Beaupré's technique was to become universal in hydrography. The quality of his charts was praised by d'Entrecasteaux and many years after his own voyage to these same waters Matthew Flinders said that Beautemps-Beaupré's published charts: "...contain some of the finest specimens of marine surveying, perhaps ever made in a new country." (Flinders vol 1, p. xciii)

An astronomical observatory was set up on what is now known as Bennett's Point in Recherche Bay and although they were frustrated by cloudy weather in being able to observe stellar eclipses, Rossel continued his measurements of magnetic variation. Alexander Von Humboldt has been credited with conducting the first surveys of global magnetic intensity and of demonstrating its variation with latitude. This was based on measurements he took in South America, 1798-1803. Rossel took measurements at six locations during the expedition, including Recherche Bay on both visits in 1792 and 1793 and at the equator. Since magnetic dip increases with distance from the equator the Recherche Bay measurements had the highest variation. Rossel wrote the official journal of the expedition and described his method there, but it was not published until 1808, after Von Humboldt. The bicentenary of Rossel's work at Recherche Bay, in 1992, was marked by the Specialist Group on Solid-Earth Geophysics of the Geological Society of Australia. A paper by Ted Lilley and Alan Day describing Rossel's work in some detail and the Society's recognition of the bicentenary was published in AGU's *Eos* in 1993 (Lilley).

With Louis Ventenat's assistance, Labillardière made many shore visits, collecting botanical specimens, but he was confined to the shore nearest the anchorage due to lack of a boat during the 1792 visit. The work of the geographers had precedence and there was some tension between Labillardière and d'Entrecasteaux over lack of support for the work of the naturalists. During the 1793 visit to Recherche Bay, Labillardière made collecting trips of several days, walking as far as South Cape Bay and Moonlight Ridge, well on the way to Mt La Perouse. Even today, these are bushwalks on formed tracks, although a reasonably difficult one in the case of the track to Mt La Perouse. With so many new plants to see, La Billardière was a disciplined field botanist who did not allow his collecting to outstrip preparation and description of specimens aboard ship.

During their first stay, according to Ventenat they collected 5000 specimens comprising thirty genera and about 100 new species (Duyker p.98). There is only time in this paper to comment on a few of these plants, chosen for special reasons. The genus *Eucalyptus* was

new to science and one of the first species collected by Labillardière was *Eucalyptus globulus*, the Tasmanian Bluegum. The ships' carpenters tested the timber and used it for repairs to *Recherche*. Later in his life Labillardière advocated its introduction to France. It is now Tasmania's floral emblem, has been introduced to many countries and grows on every continent. The timber is used for construction, paper production and as fuel. Since this is a marine science gathering it is worth mentioning one of the species of macroalgae he described. What we now know as Bull Kelp, *Durvillea potatorum* was collected by Labillardière and described in his *Novae Hollandiae plantarum specimen*, although his generic name for it has since changed. He must have tried, or observed its use by the aborigines who roasted it, soaked it in fresh water, and roasted it again before eating the kelp. It is said to taste like salty potato.

There is a lasting legacy from Labillardière's work. Fifty plant genera that he established still exist and other botanists recognised him by using his name, either 'billardieri', or 'labillardieri' as specific epithets in over a hundred plant names. The English botanist, James Edward Smith, named the genus *Billiardiera* in his honour. It has some thirty Australian species in the genus, including, *Billiardiera longiflora*, which Labillardière collected when he was here (Duyker p.244).

His two volume *Novae Hollandiae plantarum specimen* (1804-06) with 265 engraved copper plates, was the first general flora of Australia. Edward Duyker, in a biography of Labillardière, published in 2003, says this of his botanical work: "The elegant plant names Labillardière coined are now part of our language, just as his story is part of our story. Labillardière has the distinction of having named the floral emblems of Tasmania (*Eucalyptus globulus*) and Victoria (*Epacris impressa*), as well as the genus *Anigozanthus* to which the floral emblem of Western Australia belongs... His *Novae Hollandiae plantarum specimen* remains the product of an extraordinary individual exercise in collection, scientific analysis and description". (Duyker p.1)

We have to rely on Labillardière's *Relation du voyage à recherche de La Pérouse* published in 1800 for information on the work of the naturalists on the expedition. In addition, a large section was devoted to his observations on the aborigines. These are unique, because they were the only Europeans to see aborigines in their natural state, before European settlement. The French expeditions treated native populations with respect, attempted to establish friendly relations and made detailed written observations, drawings and paintings of Tasmanian aboriginal culture. As with all its scientific work, the Baudin expedition was more extensive in this respect.

Rossel edited the official record, based mostly on d'Entrecasteaux's journal. It was not published until 1808. Beautemps-Beaupré's hydrographic methods were included in an appendix to volume 1 and Rossel's own calculations in marine astronomy were in the appendix to the second volume.

When d'Entrecasteaux died at sea from scurvy, north of New Britain and four months after leaving Van Diemen's Land, the expedition began to disintegrate. The expedition had

been unable to control scurvy and by the time the ships reached the Dutch East Indies there were thirty cases on each vessel. There they were met with the news that the king, Louis xvi, had been executed, a republic declared and France had been at war with the Netherlands for eight months. D'Ariveau, who had assumed command after d'Entrecasteaux's death was a royalist and divisive in his leadership, even asking the Dutch to imprison the republicans from the expedition. Dysentery was rife in the Indies and d'Ariveau died from it just after he had arranged for the ships to be sold to pay, or defray, the expedition's debts to the Dutch for supplies. According to Labillardière, approximately 40 percent of the ships' complement had died by the time they had left the Indies.

French scientific voyages continued after d'Entrecasteaux. The expedition despatched by Napoleon and led by Nicolas Baudin was the next major expedition and the one to spend the most time in Van Diemen's Land. This time the zoological collections were prominent. The inventory compiled after the voyage showed a total of 18,414 individual items comprising 3,872 species, of which 2,542 were said to be new (Bonnemains p. 181). Amongst the marine species collected by Peron, was the Spotted Handfish, *Brachionychthys hirsutus*, which was common in and endemic to the Derwent River. It now has the dubious distinction of being the only marine fish species in Australia which is listed as endangered, both nationally under the EPBC (Environmental Protection and Biodiversity Conservation) Act and internationally in the IUCN Red Data Book.

French marine science exploration on ships from Brest continues until this day. The Australian government first chartered IFREMER'S research vessel, *l'Atalante*, to undertake swath-mapping of the seabed in Australian waters in 1994, then again in 2001. The surveys were conducted by the Australian Geological Survey Organisation. In 1997 CSIRO Marine Research used the detailed swath-mapping of seamounts from 1994 as the basis for a survey of the benthic communities and the impacts of deep sea trawling in an area 170km south of Hobart (Koslow). The first hauls with a benthic sled produced animals not seen before, giving scientists on board that rare excitement of discovering many new species. After months collating the results an "...incredible 262 species of invertebrates and 37 species of fish were recognised - an extremely rich fauna for a deep water environment." (Gowlett-Holmes, p. 87). At least 25% of the invertebrates were new to science and about the same proportion unique to that region, even confined to particular seamounts. These deep sea coral reefs on the seamounts are vulnerable to trawling and in 1999 the Australian Government proclaimed the Tasmanian Seamounts Marine Reserve, an area of 370 sq km, or about 20% of the seamounts in the area.

#### **La Pérouse's fate:**

It was not until 1827 that Peter Dillon, a South Sea trading captain, found remains of the La Pérouse expedition. *L'Astrolabe* and *Boussole*, La Pérouse's vessels, were wrecked during a cyclone on the reefs off the coast of Vanikoro Island in the Santa Cruz group, now part of the Solomon Islands.

One month before Dillon discovered the relics, Commander Jules Dumont d'Urville had sailed from Toulon on a voyage of exploration in the Pacific Islands which included instructions to find traces of La Pérouse. D'Urville learnt of Dillon's discovery from James Kelly, the harbour-master in Hobart, as he piloted d'Urville's ship *l'Astrolabe*, up the Derwent River. *L'Astrolabe* had been named to commemorate La Pérouse's ship of the same name. D'Urville sailed for Vanikoro, confirmed the wreck site, collected relics, erected a monument to the explorer, and returned to France in 1829.

On a second voyage to the Pacific and the Southern Ocean in 1839 d'Urville visited Hobart and left here for Antarctica. He had already explored the South Shetlands and South Orkney Islands and islands across the Pacific between Tahiti and New Guinea. The outstanding achievement of his voyage was the 85 days spent exploring Adelie Land in Antarctica. His work is recognised in the name of the French Antarctic research base Dumont d'Urville and the *l'Institut Polaire*, based in Brest, re-supplies the base from Hobart with another ship called *l'Astrolabe*.

It is remarkable that we are sitting here in the 21<sup>st</sup> century, in a marine research laboratory in Hobart, alongside waters which were first explored scientifically by French scientists in the 18<sup>th</sup> century and that so many connections continue: between French and Australian marine and Antarctic research, between the ports of Brest and Hobart and this in the year that marks the 200<sup>th</sup> anniversary of European settlement of the port of Hobart.

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