

Research takes a back seat

Dumont d'Urville & Paris

"It is complicated", says Françoise Praderie, director of the Earth, Ocean, Space and Environment Department at the French Ministry of Research and Technology (MRT). "I'll do you a drawing." Indeed, French Antarctic research is structured like interconnecting sets of Russian dolls. And even plans for reorganization are unlikely to make life much easier.

For historical reasons, government grants for research in the French Antarctic territory, Terre Adélie and the four sub-Antarctic islands (Kerguelen, Crozet, Amsterdam and St Paul) are managed by Terres Australes et Antarctiques Françaises (TAAF), a government department set up in 1955 specifically to preserve French territorial claims in the areas. TAAF, in turn, is under the tutelage of the Ministry for Overseas Departments and Territories (DOM-TOM).

Last year, TAAF's budget from DOM-TOM comprised about FF45 million out of the civil research budget and a further FF75 million of 'territorial' money. Most of the DOM-TOM money is spent on transport: hire of the Antarctic supply vessel, *Astrolabe* (FF17 million) and running TAAF's own oceanographic ship, the *Marion Dufresne* (FF50 million).

Because the administrative chain of command is so complex, while the unexpected nearly always happens, expeditions to the Antarctic are handled by a separate, non-profit-making association, Expéditions Polaires Françaises (EPF), set up in 1947 by the polar explorer Paul Emile Victor. With grants from TAAF, EPF makes sure everything runs smoothly 'in the field'. It orders clothes, food and fuel, schedules flights, organizes who goes and at which dates and sorts out the chaos when things go wrong.

Since the end of whaling and seal exploitation, the uninhabited TAAF districts have had almost no economic, strategic or political interest. And over the past ten years, DOM-TOM's contribution to TAAF's budget has dwindled from FF103 million to FF75 million.

As a result, EPF — almost entirely dependent on TAAF money — is itself feeling the pinch. Last year it had FF25.5 million (not counting FF20 million for the airstrip being built at Dumont d'Urville). And this year, a FF26-million budget proposal was whittled down to FF20 million by DOM-TOM.

According to Bernard Morlet, secretary general of EPF, this is not enough for both a winter and summer research programme. Fixed costs alone are about FF17.5 million, he says, and during the summer about 190 people will pass through Dumont d'Urville, including 35 incoming and 33 outgoing overwinterers. There is even talk of cancelling next year's programme altogether.

The money crisis has not helped interministerial negotiations to set up a new FF210-million polar research institute, eventually to replace EPF and leaving TAAF something of a clearing house.

In July last year, a change of chief administrator at TAAF brought discussions between the MRT and DOM-TOM to a halt. Nine months later, negotiations have restarted, the major question being the boundary between research and 'minding the shop', as far as TAAF is concerned.

Even when the institute finally gets off the ground, there will be no full-time scientific staff. In France, polar researchers come from CNRS or university laboratories all over the country, while technicians and engineers are either on fixed-term contracts or are 'volontaires à l'aide technique' (VAT) — young men doing their military service — together with a handful of military personnel, such as the surgeon, the radio operator and the helicopter pilots.

If the institute does not simplify funding, it should help France to develop a coherent polar research strategy. At present, there is almost no research in the Arctic and TAAF's scientific committee decides the Antarctic research programmes directly, either on the basis of applications from scientists, or as a result of common orientations decided by the international Scientific Committee on Antarctic Research (SCAR). As a first step, a group of French industrialists has joined

MICROMETEORITES

Prospecting in the ice

Dumont d'Urville

FOR Michel Maurette the Antarctic ice could be a storehouse for extraterrestrial matter going back to the origins of the Solar System — micrometeorites. And to prove he is not on a wild goose chase, Maurette, from the CNRS centre for nuclear and mass spectrometry near Paris, has set out to gather 20,000 micrometeorite particles in under two months. This means melting 300–400 tons of Antarctic ice without contaminating it, thanks to a 'factory' technique developed by Michel Pourchet, a chemical engineer from the University of Grenoble laboratory of glaciology.

Maurette has been working up to this gargantuan task ever since he abandoned Moon dust in 1980. Impressed by the purity of a 1978 Antarctic ice core he was able to study, and its capacity to preserve dust particles, he wanted to test an idea that it would be the perfect place to look for micrometeorites, a much more abundant and possibly more primitive source of extraterrestrial matter than meteorites. About 10,000 tons of micrometeorites measuring 50–100 µm fall to Earth every year, he says, the range of sizes also most abundant in near-Earth space —

Capital philately

ONE of the oddities of the French base at Dumont d'Urville is that it is, technically, the 'capital' of one of France's overseas territories. The overwinter leader is a district administrator, a sort of governor appointed by TAAF. And, as a territory, Terre Adélie can issue its own stamps.

Not surprisingly, this novelty has turned into something of a cottage industry. Last year, postmaster and radio operator Jean-Marie Jaguenaud sold stamps worth a staggering FF310,000. "That's a lot of mail for 33 people", quips one disapproving veteran. And of the 38 mailbags arriving on the second visit of the *Astrolabe*, ten (about 10,000 letters) were from stamp dealers asking for first-day covers and special issues with the Terre Adélie franking mark. Amateur stamp collectors get more personal treatment, a note from the helicopter pilot, or a bit of news.

From 1 January to the time the last ship leaves, says Jaguenaud, most of his time, from 8 in the morning till 10 at night will be spent dealing with post and philately. So, when Marcel 'Big Ben' Renard retires next year, he should have a pretty nest-egg. He has been collecting Terre Adélie first-day covers since the very first base at Port-Martin in the early 1950s. P.C.

with MRT, CNRS, TAAF and EPF to set up 'DIPOL' — a research foundation dedicated to the development of polar engineering technology. P.C.

compared to a "few thousand meteorites over 100 grams". And evidence suggests that over 80 per cent of micrometeorites come from comets, whereas meteorites are fragments of the less primitive asteroids.

In the 1970s pioneering attempts to 'trawl' micrometeorites in the stratosphere came up with a total of 1,000 particles, the biggest measuring 50 µm, explains Maurette. And while a magnetic rake drawn over the Pacific ocean bed in 1976 produced 100,000 magnetic 'spherules', they were all larger than 100 µm. Not only were these bigger than the most abundant micrometeorites — and therefore atypical — but it turned out that they had all melted following heating as they entered Earth's atmosphere.

So, in 1984 Maurette and a team of Danish researchers (led by Claus Hammer of the University of Copenhagen) went to Greenland to test his 'hunch' that ice would be the best preserver of micrometeorites. In Greenland the ice melts naturally, forming blue lakes, with a black sediment, 'cryoconite', on the bottom.

Maurette and Hammer recovered 25 kilograms of cryoconite which proved to be the "best preserved and richest mine of micro-