+ + OCEANS WORMLEY + +

Number 2 (June 2011)

A newsletter linking people who worked at NIO, IOS and IOSDL and those who still carry on their proud traditions.

OCEANS WORMLEY *was the telegraphic address of the Institute. Telex was the means through which much of the communication, particularly with ships, was sent. It seems appropriate to use it as the title of this newsletter.*

In this issue

Editorial

First let me say that I was pleased with the response to the first Newsletter. I had several messages from people saying they enjoyed it. Steve Thorpe even spotted his car in one of the photographs but also pointed out that Clifford Mortimer was never Director of the FBA.

The Wormley network seems to be having some nice spin-offs. Roy Wild's son Nick contacted NOC to see if we could provide some photographs of his father to give to his mother on her 80th birthday. Howard Roe and I managed to come up with the goods. Arnold Madgwick's daughter has been working with John Driver and Jane Stephenson (NOC librarian) to ensure that Arnold's photographic collection is appropriately saved. It included two old plate cameras probably from the Discovery Investigations that will now come to the NOC archives. Arnold is in a home near Selsey and Julia says he would enjoy ex-Wormley visitors. I can put people in touch with Julia.

We have a diverse selection of articles in this edition. Gwyn Griffiths (recently appointed as NERC's "Chief Technologist") kindly volunteered to continue the theme of how technologies conceived at Wormley have since matured. He tells how Autosub is now fulfilling the vision set it in the 1980s. John Moorey from his home in Nice recounts an event from the 1960s that nicely captures the atmosphere of NIO at the time. It is part of a longer history of his memories of working at Wormley that he has put together.

I'm pleased to say we have more than a page of congratulations for the achievements of former Wormleyites. Paul Ridout has written a very nice appreciation of Fred Culkin who died in February. There was a good number of Fred's former colleagues at his funeral and I was sad not to be able to attend. On a lighter note we have some reminiscences of life in the main office.

I can report that the NIO book has sold over 400 copies and its performance continues to please the pub lishers Lutterworth Press. Partly as an outcome of the book, I have been asked to take part in a panel discussion, organised by the Maritime Foundation, at the Hay Festival in June It will cover topics as diverse as deep sea oil and gas drilling, fisheries, defence and my topic - Climate change - how well do we know the state of the oceans? I will put in a plug for the Wormley legacy.

For those who perhaps hadn't noticed, a major event in Surrey last month was the completion of the Hindhead tunnel and a "walk through" on May 14th. The A3 won't seem the same without those queues of traffic.

I am happy to continue to be the point of contact for Wormley alumni issues, maintaining and distributing the contact list and producing and circulating the Newsletter. If we can establish a web site it would help to make NIO and IOS's legacy more visible and could host longer articles like John Moorey's anecdotes. If you have ideas as to how we might do this and/or are willing to help please let me know.

In the meantime I will plan to produce ++ OCEANS WORMLEY ++ twice-yearly but its continuation will depend on a flow of material. For that I need help from all of you so please think about your memories of the people, events and cruises during the Wormley era and let me know if you are willing to write something.

With all good wishes

John Gould

Lives Remembered - Fred Culkin 1929-2011
an appreciation by Paul Ridout

One frequently recurring theme of the numerous tributes to Fred was that of his modest and unassuming manner. He was never one to boast or even mention his achievements if he felt it had no specific relevance to a conversation. Yet his work was always of the highest standard and his meticulous attention to detail in the chemical analysis of seawater has underpinned much of the modern understanding of ocean chemistry. Fred's modesty became all too apparent at his funeral when discussing his passion for the game of rugby we learned that he was approached during his youth to turn professional as a rugby league player.

Fred started his academic journey in 1949 at the Mining and Technical College in his home town of Wigan where he studied full-time for a London External BSc in Chemistry. It was that solid grounding in chemistry at Wigan which developed Fred's outstanding analytical skills which played such an important role in his subsequent career. Here he met up for the first time with his life-long friend and fellow chemist Dennis Burton.

In 1955 Fred joined John Riley's group at the University of Liverpool to take over from a fellow Wigan student Robert Greenhalgh and to study for his doctorate. He became reaquainted with Dennis Burton who had been there since 1952. One of the functions of the department was to carry out long-term measurements on samples from the Irish Sea. Fred took on the task of the determination of salinity (by chlorinity titration) on thousands of seawater samples. As Dennis commented ' it is interesting that at the very beginning of Fred's career he was so involved in seemingly meaningless measurements not knowing that he would become the international authority on salinity'. Roger Wilson pointed out that the Standard Seawater calibrations which Fred carried out later for the Standard Seawater Service were probably the most precise measurements made in oceanography at that time and required the highest degree of analytical skill and discipline.

Fred joined NIO in 1960 to work with Roland Cox. He headed up a small group which eventually developed into the Chemistry Department. When Roland died in 1967, Fred took Bob Morris under his wing and Bob fondly remembers him as the person who 'was my teacher, my friend, someone who could and would tolerate my impatience and proper lack of discipline as an analytical chemist'. Fred pioneered work in ocean chemistry in the sixties and early seventies publishing important texts which are still highly relevant. He worked with Steve Calvert and Mike McCartney in the group on deep-sea chemistry and cruises included one in 1972 which was Dennis Burton's first on Discovery. As Dennis observed, Fred was not altogether comfortable with his time ashore in Tenerife. Already in pain with a foot injury he then broke a tooth on a bread roll and attributed his bad luck to Dennis's presence on the ship. Several years later, Fred was in Tenerife supervising one of Dennis's students as Dennis was committed to teaching in Southampton. Whilst unpacking boxes on the quayside with Fred, the student damaged her back and was unable to move until medical attention was received. Fred's dry sense of humour surfaced in the form of a postcard sent to Dennis that read 'That was a pretty good shot considering the distance but you missed me'. In fact, a subsequent cruise which included Dennis, resulted in us being 'stranded' in the Barbados for 10 days, so maybe Fred had a point.

From 1975 until 1989 Fred was the Director of the IAPSO Standard Seawater Service and was a member of the Joint Panel of Oceanographic Tables and Standards (JPOTS) which introduced the Practical Salinity Scale 1978 (PSS78). The comparability of salinity data worldwide is largely due to the widespread use of this single source calibration standard. It was typical of Fred that he recognised its importance and accepted the responsibility to continue its production even though it would not be a positive step with regard to his personal career. I joined him in 1977 to share the workload but he continued to be actively involved so that I could develop a research career at IOS. He was unselfish to a fault and I will always be grateful to him. On his retirement from the IOSDL in 1989 he joined OSIL as a consultant where he remained actively involved in standard seawater developments. In 2007, in recognition of his contribution to OSIL and to the marine scientific community as a whole, the company's new building in Havant was named 'Culkin House'.

Fred was a modest and unassuming man who made a significant contribution to oceanography. He will be remembered around the world by friends and colleagues who recognise his extensive knowledge in marine chemistry and appreciated his warm and friendly manner.

(OSIL was established by Paul in 1989 to produce and distribute Standard Seawater. It has since expanded into a multi-million pound business offering instruments and systems for marine environmental monitoring. JG).

Congratulations all round

Queens Award

Trident Sensors has won a Queen's Award for Enterprise in the Innovation category for its Polaris tracking system. Two of the company's three employees are former IOS scientists, founder and managing Director Helen Cussen and Bill Simpson.

The GPS tracker weighs only 500g and uses the Iridium satellites to transmit and receive data from anywhere in the world. The original systems were developed for data transmission from remote ocean platforms but Polaris is ideal for a wider range of applications and is being used to transmit weather data from Met Office buoys, for tracking ships and for reprogramming missions for autonomous underwater vehicles whilst at the sea-surface. In the leisure sector it is used for tracking competitors in adventure sports such as cycling (Mark Beaumont's Round the World Record), yachting (Fastnet Race) and gliding (International Grand Prix). Customers include research institutes, blue chip companies and the military. When used in the defence sector for tracking personnel, Polaris' sensitive motion sensor can even tell when an operative is down. The system also plays a vital part in search and rescue missions.

Polaris is presently used on *RRS Discovery* and *James Cook* and is shown here being deployed on a glacier by the University of Washington.

Trident Sensors was founded in 1997 by Helen Cussen to produce oceanographic sensors and equipment and is based at Dunsfold Business Park.

PhD and bar

Not many people have two PhDs, even fewer are awarded them more than 40 years apart and very few have them in totally unrelated topics. Peter Collar has therefore just joined a very exclusive club!

Here's his story of how he recently came to be awarded a PhD by Birkbeck College, University of London for his thesis "German propaganda against the French occupation of the Rhineland 1919 – 1924: agencies, personalities and themes".

"I've always had an interest in languages. Having done French, German and Latin to O-level at school I did one or two evening classes as a hobby over the years (some might remember the Russian classes we had at the Institute back in the early 70s). I had rather more spare time when I left the Institute and was able to get a place at Birkbeck on the 4-year BA German course.

As well as the major language content, the course had modules in German literature (including medieval literature) and modern German history. Never having studied English literature at school, let alone German literature, I found writing imaginative appraisals of authors ranging from Goethe to Kafka required a rather different set of skills to those needed for scientific papers and reports. I didn't find it easy but enjoyed the experience – much less so the annual exams.

In the course of the four years at Birkbeck I became interested in the history of the inter-war period as seen from the German side and so decided to do postgraduate research. A Ph.D seemed a good goal to aim for, though it was not as if my future career would depend on it! Apart from extensive reading of secondary literature so as to become familiar with the field, research necessitated a number of visits to the state archives in Berlin, Munich and Kew to track down relevant original documents. The Germans had been incredibly thorough in filing away all kinds of printed and written material. In spite of the destruction of a fair amount of documentation during WWII – and the partition of Germany afterwards – much survives. Browsing through documents that had hardly seen daylight since the early 1920s was quite an experience despite the adverse effects of dust on the lungs!

What next? I hope that the work might result in a book and there are a couple of unanswered questions that are intriguing and to which I would like to find the answers. That will give me a good excuse to combine a visit to the archives with a tour of the German vineyards.

P.S. Peter's first PhD was in 1966 from the University of Sheffield *"On the frequency dependence of complex permeability of thin ferromagnetic sheets"*. Quite a change in direction.

Autosub: From Artist's Impression to Reality

The setting: Wormley, 20 years ago, the hut under the trees. At one end Peter Collar, leading the Autosub programme. At the other end, Polly Williamson might be found with Letraset and scalpel preparing graphs. But, you might also have found her with palette and brushes working on a piece of imaginative art.

One of Polly's 'Artist's Impressions' for Peter Collar, reproduced below, showed an Autosub having just emerged from an area of continuous floating ice. Over a saw-tooth track the vehicle would have gathered data on water column properties and, using sonar, on the topography of the underside of the ice and the seabed.

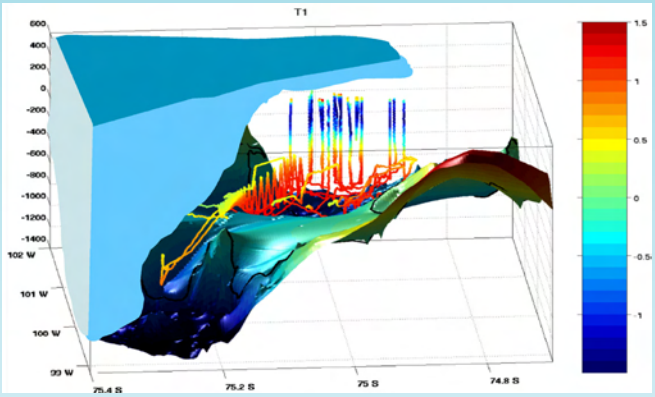
Keith Nicholls and colleagues at the British Antarctic Survey had provided a report on the science needs for missions under seasonal sea ice, and under ice shelves - floating extensions of the Antarctic ice sheet. Autonomous underwater vehicles were going to be the only way to make transects under ice shelves 100s of metres thick and 10s to 100s of kilometres in extent. Their data would be vital for determining the importance of factors, including climate change, contributing to retreat and collapse of ice shelves.

The essential groundwork for Autosub was done at Wormley, but it was not until we had moved to Southampton that the complete working vehicle – Autosub1 - was ready in June 1996. Under the leadership of Nick Millard, the first trials and dives took place in Empress Dock (right) immediately outside the laboratory and workshops, not something that could have been done at Wormley.

There followed a series of engineering commissioning trials at Portland, then from Dunstaffnage on the Calanus, before venturing to Florida in 1997 and Bermuda in 1998. By that time the vehicle had completed a single mission of over 240km. During this time, scientists had submitted a proposal to NERC for a Thematic Programme based on Autosub. This was funded in two stages, with 'Autosub Science Missions' as stage one and 'Autosub Under Ice' as stage two. Sir Anthony Laughton chaired the scientific steering committee for stage one, which was highly successful[1].

One of the later campaigns of 'Autosub Science Missions' took the vehicle and team to the Weddell Sea for studies of krill distribution and sea ice thickness, which resulted in truly novel results and a paper in *Science*. A key reference in the paper was to the work of James Marr, providing a poignant link to the work of Discovery Investigations and Wormley.

In early 2004, the first campaign for 'Autosub Under Ice' on the James Clark Ross attempted to reach Pine Island Glacier in the Amundsen Sea, but could not, due to extensive sea ice. Nevertheless much good work was done by Autosub2 under sea ice. Later in the year there were two successful campaigns under ice off Greenland.



In 2005, the target was the Filchner Ronne Ice Shelf in the southern Weddell Sea, but again sea ice proved too difficult for the James Clark Ross. Instead, Autosub2 was deployed beneath the more accessible Fimbul Ice Shelf. A brilliant mission followed, the world's first AUV section under an ice shelf. But on the second mission, the vehicle failed to return.

The science motivation remained strong, and after a great deal of attention to systems reliability, Autosub3 undertook a campaign to Pine Island Glacier on the US icebreaker N B Palmer in 2009. Steve McPhail and his team hardly saw sea ice, and the face of the glacier was clear. There followed a series of six missions returning important and surprising data on the shape of the seafloor and underside of the ice, with the results published in Nature Geoscience. The composite 3D illustration (above) of the mission tracks, prepared by Pierre Dutrieux of BAS, is the realisation of the Artist's Impression painted two decades ago at Wormley. The coloured vehicle tracks illustrate temperature from +1.5 in red to -1.5 in dark blue. The seabed bathymetry is a composite of data gathered by Autosub under the Glacier and by airborne radar either side, where the ice is grounded. The ridge, discovered by Autosub3, is crucial. Having melted beyond the top of the ridge, there is a positive feedback mechanism for this glacier to retreat a further 200km, irrespective of global warming.

For this, and other discoveries, the engineers and scientists that have worked on the Autosub project should feel very proud.([1]http://www.bodc.ac.uk/projects/uk/autosub/)

A moment of glory for John Moorey

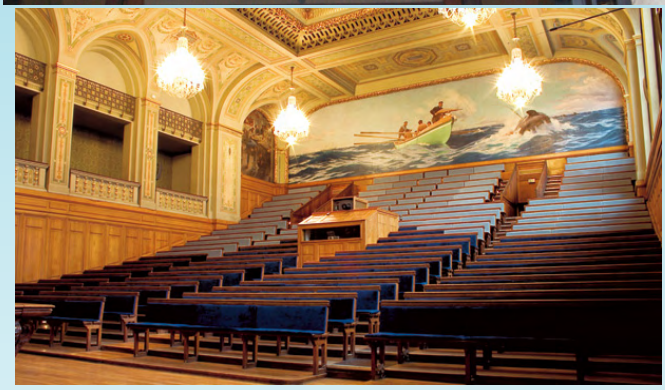
When Prince Albert 1er created the Institut Océanographique and the Musée in Monaco he also had built a similar Institute in Paris (http://www.oceano.org/) with laboratories and a very attractive conference hall. One objective was to present a series of evening lectures to the public. (They still continue to this today). Professor Maurice Fontaine (a marine biologist) organised the lectures in the 1960s.

In 1964 Prof Fontaine visited NIO and toured the lab with Dr. Carruthers and when I met them we had a conversation in French. I talked about some of the work done by Discovery during the International Indian Ocean Expedition and to my surprise, Prof Fontaine invited me to Paris to give a talk on NIO's Indian Ocean work. I later asked Dr. Deacon and he said, "Do it! we should get more people to go abroad and give talks in other languages". And so I prepared the talk; Arnold Madgwick provided me with slides and Peter David gave me about thirty large format slides complete with a list of each specimen's name, size, and the depth at which it is normally found to use at the end of my lecture.

On the Friday evening before the talk Professor Fontaine kindly invited my wife and me for dinner and I expected there would be only the four of us with Madame Fontaine going to the kitchen from time to time. However, we were greeted at the door by the butler and served drinks by the maid. There were three other couples present - the husbands (all non-oceanographic biologists) and also Professor Koji Hidaka, a physical oceanographer from Tokyo who was in Paris for a conference. Eventually the double doors of the dining room were thrown open and the butler announced "Madame est servie". The meal had a nautical theme with fish and other seafoods. Champagne was served throughout.

John Moorey in a more familiar environment

The Saturday evening lecture didn't start until 2100hrs and I was honoured by the presence of Professors Henry Charnock, Hidaka, Paul Tchernia, and Henri Lacombe. There were about 60 in the audience including many students.



Each year the Monaco Institute presents the medal of the Prix Manley Bendall to a distinguished oceanographer. After my talk Professor Fontaine presented the (very large) medal to Professor Hidaka. Out came more champagne and two photographers from the Japanese embassy. Professor Hidaka came over and stood by me saying "I must have a photo standing next to Professor Moorey".

Oh happy days, how fortunate we were to have been part of NIO.

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British recipients of the Prix Manley Bendall.

1955 J.N. CARRUTHERS
1970 G.E.R. DEACON
1982 J.C. SWALLOW
1984 D.H. CUSHING (MAFF Lowestoft)
1997 R.D. PINGREE (Plymouth and IOS)

Photo gallery

I am grateful to the response made in the last NL for photographs. The pictures below come from two sources. Just before the lab at Wormley closed Peter Saunders went round the lab photographing people in their working environment. It seems he did an excellent job of capturing their characters. Here are a few of them. Pam Draper sorted through her collection of black and white photographs and had some of them scanned. A couple of them are shown below -more from both sources next time.

Nic Millard with Autosub model

Rosie Stacey

Greg Phillips

Pat Gwilliam

Laurie Draper (in door) at RAF Ballykelly after an oil pollution postcard drop in 1954

Phyllis in the cafeteria

Pam Edwards, JN Carruthers, Henry Charnock and ? at West London reservoir in late 1950s

Another award

On March 21st Pauline Simpson received an achievement award from Wendy Watson Wright, the Executive Secretary of the Intergovernmental Oceanographic Commission of UNESCO. The award was for Pauline's contribution to the work of the IOC's International Ocean Data Information and Exchange (IODE). From 1992 to 1999 she chaired the IODE panel on Marine Information Management (MIM) and it was under her Chairmanship that most of the MIM products that are used today, such as OceanExpert, OceanPortal and OceanDocs were developed. Pauline, through her expertise and commitment created the MIM identity of IODE.

The event took place in the Cloisters of the Saint–Paul Cathedral in Liège, Belgium. 2011 marked the 50th anniversary of the founding of IOC.

Indian Ocean revisited

In the early 1970s a regular vistitor to NIO was Rob Knox, then at Woods Hole Oceanographic Institution. His project was to study the equatorial undercurrent in the Indian ocean by taking advantage of a rather fortuitous quirk of geography. The island of Gan in the Addu Atoll is the southernmost island of the Maldives and lies only 41nm south of the equator. The RN established a base there during WWII and from 1957 to 1976 it was a vital RAF base for ferrying planes to the far east.

Rob used Aanderaa current meters lowered into the undercurrent using the RAF tenders as very small research vessels. The current meters were ideal for the task because they also had a temperature sensor and had an acoustic link so that the data could be monitored on board. The instruments were prepared by John Cherriman at NIO.

Rob, who now lives just north of San Diego in California recently returned to Gan and now sports an RAF Gan sticker on his car. For more details about Gan and his his visit see :-

http://www.gan.phillipsmall.me.uk/00%20-%20Articles/AVisitingYank.htm

Memories of the main office

Kay Clement (née Knight) sent in this photograph of the "girls" in the main office taken in 1966.

In the picture are (L to R), Kay, Carole Setterfield (now Jewett), Margaret Lynch (now Spreadborough), Mavis Edge, Wendy Moreau (now ??), Val Roberts (now West), Miss Stiven, Janet Trent (now Rothwell), Margaret Hastewell (now ??) and Jenny Husk. The cake was in honour of Val's 21st birthday.

Mavis, Janet, Margaret, Val and Kay still meet regularly and the following are some recollections of life in the main office put together at their latest meeting.

"Technology" was almost non-existent. There was a large Xerox copying machine which had its own room and was in almost continuous use. Typewriters were manual (hard work, pounding away at those). There was one special machine in the Main Office which was used for mathematical papers. It had a double keyboard; touch typing wasn't easy on the alternative keyboard – knowledge of the Greek alphabet helped! All scientific papers and letters were either dictated to a shorthand typist or written by hand for deciphering and reproduction (Xerox or stencil).

Miss Stiven was the Officer in Charge of the Main Office and law and order was maintained (most of the time).

In 1964 the Government introduced the "Contract of Employment" ruling whereby every employee should receive a Contract showing working hours, (five and a half days a week then), salary, holiday entitlement, etc. They were duly typed for all staff. Any employee not

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complying with the rule could receive a financial penalty of £500.

When NIO became part of the NERC, its Royal Charter was rescinded and a document to this effect was typed on Vellum at NIO and sent back to H.M. the Queen.

Mavis particularly remembers taking verbatim minutes at a meeting of all the British Fisheries representatives. This was held in the Board Room on the original RRS Discovery on the Thames Embankment. It was chaired by Joseph Mallalieu, Minister of Defence for the Navy. Transcribing the notes next day was a daunting prospect . To ensure the notes were transcribed correctly (sheaves of them), Mavis was holed up in the Conference Room and not allowed out until mission completed.

There is one anecdote (of many) which we remember. A note was put on the Notice Board at the top of the stairs in the old building, by the signing in table for the Attendance Books.

"There is going to be a white line painted down the middle of the stairs, so those who arrive late don't bump into those who are leaving early." A week later another note was put on the Notice Board.. "The white line idea has been scrapped, as those who arrive late are the same ones who leave early, so there is no problem ……"

From the National Oceanography Centre

Discovery replacement

Edward (Ed) Cooper reports that the project continues to the timescale established by the contract with CNP Freire Shipyard, Vigo which will lead to the delivery of the vessel to NERC in June 2013. Steel cutting started in November 2010 and measured by steel weight the hull is now almost half constructed.

The shipyard held a small celebration at the keel-laying in February 2011 which was attended by NERC Chairman Ed Wallis, NOC Executive Director Prof. Ed Hill and members of the Project.

With progress on the hull advancing towards an anticipated launch in January 2012 many of the major systems have been purchased. For some of the purchased item we are on the cusp of turning specification, design and testing into reality with an extensive period of Factory Acceptance Testing due between mid June and September this year. After launch in January 2012 with some of the larger items pre-installed in the hull on the slipway outfitting will commence at a quay in another part of the shipyard.

A model of the new Discovery displayed at the recent Norshipping Exhibition

A photographic record of the build is being published on the project website http://www.noc.soton.ac.uk/nmf/discovery_replacement_project/Photographs.html

The next ++ OCEANS WORMLEY ++

I'm grateful for the material that has been sent to me. It would be good if we could have more from our biologists and on geology and geophysics. I am prepared to do the layout for the next issue (though I'm not a design expert) but will need text and photos. Here are some ideas for possible items

- Reminiscences of memorable cruises
- Reminiscences of life at Wormley (not necessarily about science)
- Photographs, preferably including people.
- Articles linking science in the Wormley days to science today.
- Glorious failures (the bits of kit that didn't work).

Please send any material to me at wjg@noc.soton.ac.uk

I would aim for the next issue in November 2011.

Spreading the word

Not everyone has e-mail access so please print copies and give them to anyone you know who might be interested and please let me know the e-mail address of others who might like to be on the mailing list..

Postscript

Dick Burt leading a knitting class on Discovery's foredeck