W E L C O M E

Julian Mayes, Secretary / Newsletter editor

Welcome to the second History Group Newsletter of 2016. I hope to issue a third one in December if sufficient material is submitted.

Since the last Newsletter issued at the end of the winter the History Group has been involved with a successful meeting at Whitby and has firmed up plans for a joint meeting on thermometer screens later this year. Your committee is starting to assemble a programme of future meetings and details of these will appear in future issues of the Newsletter.

If you have any thoughts on possible meeting topics, do please drop me a line (my contact details are on the back page). Sadly, I am unable to provide the riches that Malcolm Walker was accustomed to writing on these pages.

This issue of the Newsletter includes a first article by our Chairman, Norman Lynagh, on changes in observation practice. In comparing manual and automated techniques, I suspect that Norman discusses an issue that several members may have views on or indeed just memories – you are very welcome to share them with us in the next issue!

Dr Anita McConnell

History Group member and former winner of the Jehuda Neumann Prize, Anita McConnell, died on Thursday April 28th. Jane Insley has paid the following tribute:

She had a formidable record of work in the history of scientific instruments (oceanography, geomagnetism, meteorology, optics, and most lately, accepting the Paul Bunge Prize on behalf of Brian Gee for his posthumous work on Francis Watkins). In meteorology she was particularly associated with the history of barometers, although her PhD in 1979 was on historic instruments for physical oceanography through her employment at the Science Museum; she worked there until 1988.

Freelance work followed, including a trading business in historic barometers, with Patrick Marney. She became a Research Editor for the New Dictionary of Scientific Biography for the UK, completing 600 entries (more than any other contributor - they have now changed the rules) greatly enhancing the coverage of engineers in the course of her time there. In recent years she has been associated with the Whipple Museum for the History of Science at Cambridge, helping with both museum and teaching, and a book on her research into the history of glass is in preparation.

She worked with Maurice Crewe on the bibliographies section of the History Group newsletter, and was awarded the Jehuda Neumann Prize in 2005.

New members

So far this year, two new members have joined the History Group and we extend a warm welcome to them both.

Alexandra Johnson, Science Museum

Stephen Davenport, MeteoGroup (USA/Canada)
THE ‘YEAR WITHOUT A SUMMER’, 1816
This meeting originated as a History Group meeting and was adopted as a Main Society meeting with the North East Centre of the Society. It was well attended and successful. A meeting report follows.

FUTURE MEETINGS

FROM STEVENSON TO AWS SENSORS
This is an RMetS National meeting organised by the History Group and the Met. Observing Systems SIG. Richard Griffith is Meeting Manager.

Date: Saturday 15 October 2016
Time: 10:00 - 16:00
Location:
London Mathematical Society
De Morgan House
57-58 Russell Square
London
WC1B 4HS
United Kingdom

Designed by Thomas Stevenson, the British civil engineer, the Stevenson Screen forms a crucial part of any weather station allowing thermometers or electronic sensors to measure temperature and humidity in a standardised way. There are many designs to be found around the world and this meeting will look at the history, development and future use of thermometer screens.

Programme

Thomas Stevenson
A better box for holding thermometers
The new screen, its design and manufacture
Screens from around the world
From Mercury to Sensors
Screen use in Polar environments
Amateur Screen Trials
Panel discussion
M Roy
S Burt
J Wright
I Strangeways
M Molyneux
S Colwell
G Jenkins
R Griffith

As usual with RMetS meetings, registration is required via www.rmets.org.

THE ‘YEAR WITHOUT A SUMMER’, 1816

Nearly 60 people, chiefly members of the History Group and the North East Centre of the RMetS travelled to Whitby on 20 May 2016 by various means to enjoy a long weekend at this meeting. On the first evening several of us enjoyed a pre-meeting dinner at The Magpie Café. Arriving at this time also afforded an opportunity to see the Whitby area at its best in bright sunshine.

After this convivial start, the meeting proper started on the 21st at Whitby Museum. After a brief appreciation of Malcolm Walker’s contribution to the History Group, noting that this was the Group’s first meeting since his death, the first talk of the day was by Trevor Goodall on the weather and climate of the Whitby area. Trevor drew on his local weather observations which have run from the late 1970s. His data show that Whitby has a maritime temperature regime and a clear tendency to have the finest weather with offshore rather than onshore winds. Gales have been recorded in each month of the year. Trevor noted that his highest recorded gust of 99mph on 8 January 2005 might have been higher had the anemometer not failed.

Nick Klingamann (Reading University) set the meeting in context by discussing the eruption of Tambora in April 1815 in vivid detail. Heating caused by pyroclastic flows caused such pressure variations that whirlwinds developed and induced 15 foot high tsunamis. The eruption lasted for 48 hours and ash fell for a
week, reaching a depth of 40 feet at a distance of 20 miles. 12,000 people were estimated to have been killed. The aerosol cloud spread up to 32km and spread globally leading to the meteorological effects that were to be the focus of the rest of the meeting. 1816 is thought to have been the coldest year since 1400. It was particularly inclement in New England where the term ‘year without a summer’ was actually coined. This triggered migration westwards towards the Ohio Valley.

The venue for the meeting - Whitby Museum

Phil Jones (University of East Anglia) maintained the climatic theme by examining the effects on the weather in the British Isles in 1816. It was the third coldest summer in the Central England Temperature series (colder summers being recorded in 1725 and 1695). The previous winter had not been cold due to a south-westerly airflow but by July conditions became exceptionally cyclonic over the British Isles with a pressure anomaly over England, Wales and the southern North Sea of -7mbar. It was only the 23rd wettest summer on the England and Wales Rainfall series and less anomalously wet over Scotland, as would be expected from a cyclonic anomaly just to the south. Phil noted that the coldest conditions relative to average were found over Switzerland (an area we returned to later in the meeting) and wettest over South East England and northern France.

Astrid Ogilvie (Stefansson Arctic Institute, Iceland) then changed the focus to the wealth of documentary records available in the climatically sensitive country of Iceland. Her subject was the regular reports prepared by Sheriffs and Districts Governors. After a severe winter and a relatively cold spring in 1816, sea ice was widely noted off the north coast of Iceland in the spring where it affected trading ships. After a dry but frosty start to June in northern areas, the rest of the summer was noted as having frequent rain, snow and frost, though reports from the south of Iceland mentioned more clement weather at times in the mid-summer. 1816 was the 17th coldest in a series that gives 1812 as the coldest year. 1816 was described as a moderate sea ice year. Although vegetable and hay growth were adversely affected by the weather, the year was not exceptional.

Ed Hanna (University of Sheffield) examined the influence of solar variability on temperatures in the early 19th century. 1816 falls within the Dalton Minimum of sunspots that lasted through the 1810s and 1820s, following the Maunder Minimum. Sunspots are an index of solar activity because they are surrounded by areas of enhanced activity on the Sun. The sunspot observation data was compared with the satellite measurements of solar irradiance that commence in the 1970s and the former have been used to extrapolate the irradiance data back in time. It is well known that Sudden Stratospheric Warming events induce a weakened zonal flow and cold spells in winter and spring and Ed postulated that blocked springs between 1806 and 1816 could have been a product of this process amplified by the Dalton Minimum.

John Thornes (University of Birmingham) took us on a more artistic route in the next talk by considering how different artists depicted sky colours in the 19th century and how this may have been occasionally influenced by volcanic eruptions. However, the link between volcanic activity and sky colour was not explained until the 1890s. John started his survey with the work of John Constable, an artist noted for the realism of his sky and landscape painting, a leading advocate of the then fashion for painting in the open-air. The strength of the blue in depictions of sky can be measured by
means of a cyanometer and the ratio of red to green hues can indicate the presence of volcanic ash. Unfortunately, Constable was getting married in 1815 and so produced no suitable paintings for study and the one for 1816 (Weymouth Bay) was a depiction of a stormy sky. Finally, John pondered whether Munch’s ‘Scream’ could have been based on the skies following the eruption of Krakatoa in 1883.

Matthew Ayre *(University of Sunderland)* placed the focus back to Whitby by describing the life and work of William Scoresby Jnr., a Whitby whaler and leader of the Arctic whaling trade that took off during the 18th century. Whale blubber was rendered down to provide oil. A bounty was offered for the return of completed logbooks at the end of expeditions. 300 are known to exist with many containing thrice-daily weather observations. William Scoreby’s father was also a Whitby whaler (who invented the crows-nest). William himself was a polymath who invented a range of instruments and was a skilful observer; for example, he noted the variety of forms of snowflakes. In 1817 he sailed to Jan Mayan and approached Greenland. By 1820 he published the definitive guide to whaling in the Arctic.

The last two speakers provided a cultural perspective on the year without a summer. Pierrette Thomet *(freelance composer and RMetS WAM Special Interest Group)* told the story of John Polidori and the music of the Vampyre. She started by playing an extract from one of Heinrich Marschener’s operas. It contained a short story, The Vampyre, written by John Polidori, Byron’s physician. The inspiration for this was the inclement weather of June 1816 in Switzerland. Percy Shelley, Claire Clairemont, Mary Wolstencroft and Byron stayed at the Villa Diodati in Colgny. Cataclysmic weather events provide a ‘sublime’ environment for their holiday.

As well as The Vampyre inspiring Bram Stoker’s Dracula in 1897, Mary started work on writing Frankenstein. The claustrophic proximity forced on the gathering was the catalyst for their creativity.

The meeting ended with another talk that linked science with art and culture. By means of direct quotations, Simon Jones *(Professor of English Literature at Durham University)* illustrated the way in which the weather of 1816 in Switzerland may have contributed to the atmosphere in which Frankenstein was inspired and how the setting of Whitby inspired Bram Stoker to write Dracula following a three week visit to the town in 1896. The latter contains the following description of the town:

‘Between [Whitby Abbey] and the town there is another church, the parish one, round which is a big graveyard, all full of tombstones. This to my mind the nicest spot in Whitby, for it lies right over the town, and has a full view of the harbour and all up the bay...It descends so steeply over the harbour that part of the bank has fallen away, and some of the graves have been destroyed.’

A view of Whitby harbour from below the churchyard

Altogether, a successful and informative weekend. Our thanks our due to Dennis Wheeler of this group who chaired and compiled the programme, to the museum for the excellent lunch and venue and to Marcia Spencer and Sylvia Knight for making it all possible.

Julian Mayes
Weather Observing as it once was

Most weather observations in the UK operational network today are produced by automatic weather stations but it wasn’t always so. This reliance on AWS is a relatively recent development which has seen the demise of weather observing as a profession. In some respects, a network comprising mostly AWS is better than a network of manned observing stations while in other respects it is inferior. They cannot be considered as two ways of doing the same job. They are two different activities, many of whose products overlap, but by no means all.

I began my career in meteorology at Prestwick Airport in 1961. In those days, it was a very quiet airport. There were no scheduled flights and the majority of aircraft movements were aircraft belonging to the U.S. Air Force who had a base on the north side of the airport. Despite the airport being quiet, weather observing was considered a very important activity and was carried out entirely by Met Office staff. Air Traffic Control staff in the tower did no weather observing and relied totally on what was passed to them by the Met Office Observer. The Weather Forecast Office and ATC communications shared a single storey building separate from the terminal building. Rather bizarrely, the terminal was located in Orangefield House, a building that dated back to 1690 and the Control Tower was a somewhat unsympathetic structure built on top.

The Weather Observing Office was located in the Tower, immediately below the Controllers.


The latter is a very evocative bit of film shot in 1947 (best viewed full-screen) and includes a couple of shots of chart analysis and chart plotting in the Forecast Office. Can anyone identify the individuals?

The Met Office roster was arranged such that there was a Senior Scientific Assistant (SSA) on duty in the Observing Office at all times. In good weather the work was routine, comprising the issue of AEROs (as they were called in those days) every half hour and SYNOPs every hour but in bad weather the observer had to be really on his toes with the issue of non-routine Special Reports as and when significant changes in conditions dictated.

With the requirement to keep a continuous eye on the weather, keep the obs. book up to date, keep the flow of paper to the controllers and pass all the observations to ATC communications to go onto MOTNE this could easily become more than one man could readily cope with. Therefore, in bad weather an Assistant was usually despatched from the Forecast Office to the Observing Office and Double Observing was initiated. This meant having one person out of doors continually doing the observing while the other was indoors keeping up with the paperwork.

An added complication was that the observers in the Observing Office had no access to the met instrument enclosure which was located on a grass-covered roundabout about 15 metres in diameter, surrounded by tarmac. (Surprisingly, I see on Google Earth that the roundabout still exists as does the building that housed the Forecast Office - see images below). Someone from the Forecast Office had to take the readings and pass them on to the Observing Office.
In 1962 a new control tower was opened near the intersection of the runways, about 1300 metres SE of the old tower. This was in a much more rural location. The new tower contained a new Weather Observing Office, again on the floor immediately below the Controllers. See http://www.geograph.org.uk/photo/4175295 and http://www.jetphotos.net/photo/5789986

Due to the distance, it was no longer possible to send an Assistant from the Forecast Office to the Observing Office for Double Observing duties when required. Instead, the staffing was altered such that there was always an SSA and an Assistant on duty in the observing office. In bad weather we were busy but in fine conditions there was barely enough work to keep one person occupied.

The met instrument enclosure was relocated to the new control tower so the Observers could now access this. (I wonder if there is any discernible discontinuity in the Prestwick Airport climate as a result of this relocation.) The image below shows the two locations.
With a well-staffed Observing Office, a ‘proper’ job could be done. Times of start and finish of precipitation were logged to the nearest minute and lots of other minutiae were recorded. In other words, the weather was ‘observed’ and recorded in a way that no AWS can match. An AWS cannot see stratus forming on the hilltops around the airport; it cannot see patches of sea fog lapping onto the NW end of the runway; it cannot see the high cloud on the western horizon heralding the approach of a warm front from the Atlantic; it cannot see the stream of Cb clouds running down the Kintyre Peninsula in a polar maritime NW’ly; it cannot see where the snow-line is on the surrounding hills; it cannot see the reduced visibility caused by adjacent heavy showers. I could go on. Of course, some of this information may be included in the METARs generated by ATC staff but that is not a substitute for comprehensive observing by dedicated and fully-trained, meteorological observers.

Of course, all of this came at a cost. Having 2 people dedicated to weather observing 24/7 takes a total of 10 full-time employees. Unfortunately, people cost money and the salaries and associated costs of 10 people would have been a significant sum of money. I do not know how long this level of staffing continued as I was posted to Nutts Corner, then the airport for Belfast, in 1963. When I got there some of the staff were in on-going discussions with HQ in Bracknell regarding overtime payments relating to a period of several days when they were stuck at the airport due to blizzards in the notorious winter early that year. The stranded staff had continued the programme of observations despite the airport being closed. But that is another story and perhaps someone else might recount their experience of being stranded at Nutts Corner.
Another aspect of the work in the Forecast Office at Prestwick Airport was the collection of observations from a number of lighthouses at various points on the coast every 3 hours. This was all done by telephone and we built up quite a rapport with these men, none of whom we ever met face to face. Their input to the observing network was very important in those days, even though weather observing was very much a secondary task for them.

Clearly, significant savings can be achieved if adequate weather observing can be carried out without the use of human observers. As technology advanced during the latter part of the 20th century automatic weather stations were gradually developed that could do an adequate job of observing certain aspects of the weather. Progressively, these replaced the human observers in the Met Office and also replaced the lighthouse keepers who were being phased out as the lighthouses became automatic and no longer needed keepers on-site. Nevertheless, it cannot be argued that the product from an AWS is the same as that which is generated by a human observer.

AWS make measurements of various weather parameters at the precise location of the instrument. Human observers make observations of the weather within the visible radius from the observing point. A well-kept obs book contains a wealth of information additional to the basic measurements. An AWS cannot provide this.

Fifty years ago instruction in weather observing was a substantial part of the Training Course for Scientific Assistants in the Met Office. This resulted in a high quality observing network around the country. The ‘official’ observing network in the UK now has very few manned observers but the art of observing is far from dead. As the number of professional weather observers has decreased there has been a significant growth in the number of so-called ‘amateur’ weather observers. This group includes very many true amateur enthusiasts but it also includes many professional meteorologists. The growth in amateur
observing has been stimulated by the availability of relatively low cost instrumentation and also by co-ordinating organisations such as the Climatological Observers Link (COL).

It might be said that we now have two separate observing networks. One is the ‘official’ observing network of AWS providing measured data for input to NWP. The other is the network of so-called ‘amateur’ human observers who do sterling work in observing and recording the weather around them. The two networks do somewhat different jobs and are best considered as being complementary. There is a place for both and it is to be hoped that there will always be plenty of people who get enjoyment and satisfaction from observing the weather around them and recording the details. It’s an excellent retirement hobby!

Norman Lynagh
Chairman, History Group

---

The quest for an historical perspective

The edition of the Metro free newspaper published on 1st March 2016 may be an unlikely place to find a true historical perspective. However, an article published on an inside page demonstrated an intriguing balance between short term and longer term concerns. Several column inches were devoted to a discussion of the weather for the next few days, expressing surprise and horror at the prospect of a few wintry showers in places. How could such a thing happen at the start of spring?

None of this would count for anything but for a single sentence at the end of the article. This noted that we had just come to the end of the mildest but-one winter for over 350 years. Of course, this was a reference to the Central England Temperature series. Further elaboration on this historic record was clearly not deemed to be newsworthy, unlike a few wintry showers in early March.

Can we lengthen our historical perspective?

Over a year ago, Malcolm Walker expressed his dismay in this Newsletter at the lack of long term areal climatological records for the UK. Specifically, why is it that temperatures and rainfall are quoted in a series starting in 1910 and sunshine data series appears to start in 1929?

The answer, as many History Group members will realise, is that these time-spans represent the extent of digitisation of past records in the Met Office. Members of the public may have different understandings, thinking that records suddenly started in 1910 and 1929 respectively. Let us hope that these series can be extended back into the 19th century in the foreseeable future so we can do justice to the pioneers of rainfall measurement in the UK.

On a related issue, the History Group has recently heard from the daughter of a long-standing, recently deceased amateur weather observer in Dundee. It is hoped that a comprehensive set of weather observations stretching back into the early 20th century will soon be deposited at the Met Office’s Edinburgh archive. Collectively, do we not have a responsibility help protect such records, the value of which may not be appreciated until they are brought together?

Julian Mayes
Odon Godart's tribute plaque and the mystery of his D-day forecast

The story of the forecast that launched the Normandy invasion on 6\textsuperscript{th} June 1944 has been repeated so many times that few can be unaware of the basic facts.

The success of the operation depended on there being fine weather with light winds, little low cloud and good visibility over the Normandy beaches between Cherbourg and Le Havre. For logistical reasons a 5-day forecast, centred on D-day, had to be made at least three days before the first seaborne landings took place. Dr, later Group Captain, J M Stagg was appointed the Supreme Commander’s meteorological advisor in November 1943 - but without a meteorological section of his own. Instead his role was to chair telephone conferences between three 2-man teams of forecasters representing the Meteorological Office, the US Army Air Force (USAAF) and the Admiralty (Figure 1), before briefing the Supreme Commander, General Eisenhower, with an agreed forecast, (Minutes of a Meeting held at Victory House, London, on 5 January 1944. Document in Met Office Archives).

Figure 1. The wiring diagram for the meteorologists associated with the meteorological arrangements and forecasts for D-day. Only Stagg and the three teams underlined in red, made any significant contribution to the discussions. The Swell Forecast Section, based at the Admiralty in London, was responsible for the sea state forecasts; although its officers listened to the conferences they never contributed. The majority of the images are contemporary. © B J Booth.
Practice forecasts began at the end of February 1944, becoming more frequent as early June (the target period) approached. A lack of information, to say nothing of there being no recognised method of forecasting for extended periods, made the forecasters' task extremely difficult, and it was rare for the three teams to arrive at an agreed forecast without protracted argument.

The seaborne landings were planned to start just after dawn on 5th June, but when Stagg briefed General Eisenhower (the Supreme Commander) and his Chiefs of Staff during the evening of 3rd June, the forecast of persistent warm sector conditions and winds in excess of the minimum required, was so unpromising that Eisenhower had little option but to order a postponement of at least one day. During the following 24 hours a major change in the synoptic type took place, as a cold front unexpectedly swept east across the United Kingdom and the English Channel. At the evening briefing on the 4th Stagg's promise of improving conditions following the frontal passage, was enough for Eisenhower to order the operation to be resumed. As planned, the first seaborne assault troops touched down on the Normandy beaches just after dawn on 6th June.

That is a very brief summary, but the events are well-documented in Forecast for Overlord by J M Stagg and National Archives file WO 219/2903.

As the basic story has been repeated many times in books, plays and films, British and American visitors to Bousval (Belgium) would be forgiven their surprise at finding a plaque paying tribute to Odon Godart as being the man responsible for delaying the invasion from the 5th to 6th June (Figure 2). Odon Godart? Who was he? Has there been a conspiracy to hide the real story of the D-day forecast for over 70 years?

Figure 2. The memorial plaque in the town square of Bousval, honouring Odon Godart. The citation reads "In 1942-1945, advisor to Bomber Command who caused the date of the Allied landings in Normandy to be delayed from 5th to 6th June 1944"

Who was Odon Godart?

(Most of this section is based on Godart's personal accounts of his wartime experiences. The first, Les prévisions météorologiques britanniques pendant la guerre 1940-45, was published in Ceil et Terre, a Belgian magazine during 1986; the second, Preparation météorologique du débarquement, appeared in Météorologie Maritime, a Météo-France magazine, during 1994. Both articles can be found in the Met Office Library. A television interview with Godart was broadcast by the Belgian state broadcaster, RTBF, on 31st May 1994. (http://www.sonuma.be/archive/odon-godart-m%C3%A9t%C3%A9o-bomber-command#.U6nFVcFDfOo.gmail))
Odon Godart was born in Fariennes, Belgium on 21\textsuperscript{st} August 1913. Shortly after graduating in geophysics at Leuven Catholic University in 1933, he went to live in the United States and worked at the Massachusetts Institute of Technology where, amongst other interests he was involved in radar research and astronomy. Anxious to support his country after Belgium was occupied by German forces in 1940, Godart re-crossed the North Atlantic during 1941 and joined the Free Belgian forces in the United Kingdom (Figure 2).

Figure 3. Odon Godart in Free Belgian Forces uniform. Source unknown

After receiving some basic instruction in meteorology, Godart was selected to establish meteorological organisation in the Belgian Congo in December 1941. He never took up the post, but instead became a member of the Belgian Section of the Royal Air Force Volunteer Reserve. Commissioned as a Pilot Officer in the Meteorological Branch just before Christmas 1941, he was posted to the Group Meteorological Office of HQ 3 Group Bomber Command at Exning in Suffolk. The Senior Met Officer at the time was R C Sutcliffe, and the two men collaborated to publish a paper on the theory of constructing forecast upper air charts. About a year later Godart was posted to the Command Met Office of HQ Bomber Command, near High Wycombe, where he remained until returning to the continent in August 1944.

After working towards the re-establishment of the Belgian meteorological service after the war, Godart returned to Leuven Catholic University as Professor of Astronomy in 1959. He died on 18\textsuperscript{th} April 1996, aged 83.

January to June 1944 as seen by Godart

In January 1944 Stagg received forecasts from the HQ of the civilian Met Office at Dunstable.

However, he was unable to fulfil his role as Eisenhower’s meteorological advisor because Eisenhower’s own American forecasters, led by Colonel Irving Krick, dominated proceedings. Indeed, they were already advising Eisenhower of ten days of sufficiently fine weather for the invasion to take place in May. So concerned was Stagg at this development, that he sought support from military forecasters representing Bomber Command and the Admiralty to bolster the advice he was receiving from Dunstable. In response the Commander-in-Chief (C-in-C) of Bomber Command, Air Marshall Sir Arthur Harris, appointed Sutcliffe as his main representative with Godart in support.

Conferences involving 2-man teams of forecasters representing H Q Bomber Command, the Admiralty, the Central Forecast
Office at Dunstable and the Americans and chaired by Stagg, were conducted via a secure telephone link. At the end of February Godart was called to a meeting, attended by all the forecasters except the Americans. It was at this meeting the forecasters were told that Eisenhower had requested forecasts of 10 days of fine weather - to be made at least 15 days before the start of the forecast. Those present considered this was impossible but agreed to see if five-day forecasts were feasible.

At the next meeting attended by Godart, in early April, it was apparent that the extended forecasts had been unsuccessful. Despite this there was general agreement the forecasts should continue, but with regular (daily?) conferences at 6 pm. During the next month the weather criteria were changed; although the requirement for fine weather was confirmed, a new element was added, namely that adverse weather was necessary on the continent to restrict Luftwaffe operations.

When the teams met for a third time, in May, it was learned that the Admiralty would be responsible for forecasts of the sea state.

In late May a series of depressions crossed the North Atlantic from the west, the cold front of the last one being expected to clear warm sector conditions from the English Channel just before the planned landings on 5th June. However, the 6 pm chart on the 3rd led to doubts on whether there would be an improvement by the 5th, and this led to a compromise forecast at the evening conference. Shortly after the conference ended Godart answered a telephone call, made to him on behalf of Air Chief Marshal Tedder, Eisenhower's deputy; Tedder was seeking Godart's personal opinion about the weather for the D-day landing. Replying by telex, Godart advised that "aircraft will be unable to operate at low level during 5th June, but there will be no problems after 5 am on 6th June. However, the German airfields will remain difficult to operate from." In the event it was Eisenhower himself who postponed the operation.

During February 1945, by which time Godart was serving at Evere airfield near Brussels, he was visited by Air Chief Marshall Tedder. During the visit Godart was ordered to prepare the forecast for Rhine crossing (Operation Varsity) on the grounds that his "precise and decisive message sent for the Normandy landings, together with his experience in Bomber Command, demonstrated he understood the needs of the military."

What actually happened

Godart's rambling accounts of the meteorological arrangements and forecast for D-day, written in French, are difficult to follow, but I believe the previous paragraphs accurately reflect the salient points of his story. However, the version told by Stagg's diary and Bomber Command files is rather different. (Stagg's diary can be accessed on-line at https://digital.nmla.metoffice.gov.uk/?hh_cmis_query=stagg&cmis_parent_hierarchy=sdb%3Acollection%7C7852b285-b39c-4577-a59e-97700c6adeb8&hh_cmis_view=search.)

1. Stagg was occupied by meetings, planning and administrative matters during the whole of January and for much of February 1944; no forecasts were requested, nor any offered. Eisenhower's criterion for forecasts was not made known until 3rd February; they were to cover six days, to be issued and start on D-2 ('D' being the day on which the first landings would occur. The forecast was also to include an outlook for the following three days. A trial forecast was prepared on the 21st February, but never issued.

2. Although Stagg requested British clerical assistance in January, no request for military forecaster support was made to either Bomber Command or the Admiralty. Indeed, there would have been no need for any such request as the forecasting arrangements had been decided at a meeting in the Met Office HQ (Victory House) on 5th January; a meeting attended by representatives of all interested parties including the Admiralty and Allied Air
Forces. It was this meeting which agreed that the Admiralty would be responsible for forecasting sea conditions.

3. Sutcliffe was not selected to be the main Bomber Command forecaster representative by the C-in-C Bomber Command, in January 1944, in fact the C-in-C had no authority over meteorological staff. Instead it was early in April that Sutcliffe was appointed as deputy to Colonel N C Spencer, USAAF, the meteorological advisor to the C-in-C of the Allied Expeditionary Air Force, Air Marshall Leigh-Mallory. As such he listened to the telephone discussions between Stagg and the three forecasting teams, but contributed very little.

4. At no time were the weather criteria for the invasion changed; the emphasis was always on the need for fine weather.

5. There were no monthly meetings as described by Godart, but there was a meeting at the USAAF HQ on 25th April. However, this was properly minuted and Godart was not present. (Unreferenced 'SECRET' memorandum dated 1 May 1944 in Met Office archives.) Apart from a few days the forecaster conferences normally started at 11.30 am during April, but at 9.30 pm in May; there were no regular 6 pm conferences during these two months.

6. It is extremely unlikely that a telephone call was made on Tedder’s behalf following the forecasters’ evening conference on 3rd June; he would have been unaware when it finished and, in any event Stagg briefed Eisenhower and his Chiefs of Staff (including Tedder) immediately after the conference ended. The preliminary order postponing the operation was based on that briefing - there were no external influences as Godart implies. (National Archives file AIR 37/1124A).

7. Such are the differences between what did happen and Godart’s version, that the latter seems only to have existed in his mind. It is, perhaps, worth noting that his personal accounts omit any reference to his real rôle at HQ Bomber Command. The Command Met Office was not a major forecast centre, rather its task was to ensure that all the Group Met Offices followed a weather forecast agreed between the Group Senior Met Officers at a morning telephone conference. The C-in-C was briefed on the weather only by the Command Met Officer, Dr Magnus Spence, or his deputy Chris Drake. There was no upper air unit at the HQ until one became operational on 9th January 1944 with just two forecasters - Flt Lts R W Glynne and O Godart. This was their sole task; 24-hour cover was necessary and both often worked at the same time. Such was the pressure that a third forecaster, Flt Lt G R R Benwell, was added to the team at the end of February (National Archives file AIR 2/5029). Thus Godart was in no position to brief Tedder about the weather as he was fully engaged in matters relating to upper winds.

Source of the myth of Godart’s D-day forecast

Thus the Bousval plaque is based on an untruth - a myth - but how did the myth develop? In none of his accounts did Godart specifically claim to have provided the forecast that caused D-day to be postponed, although his reference to Tedder’s praise in February 1945 comes very close to it.

From further research it appears the claim first appeared in Godart’s obituary, published in the Belgian newspaper, Le Soir, on 20th April 1996. In this his obituarist wrote ‘he (Godart) fixed the date of the Normandy landings which had originally been set for 5th’. This was later embellished by Yves Vander Cruysen in his 2004 book ‘Récits de guerre en Brabant wallon (War stories from Walloon Brabant)’, in which he describes Godart as claiming ‘.. the clarity of my answer (to Tedder’s telephone call) was the basis of Eisenhower’s decision to postpone the landing from 5th to 6th June. I was very lucky. My forecast was correct .....

2008 saw the dedication of the plaque erected in his honour, and by 2014 the story became unrecognisable from even Godart’s original
account. On 3rd June the Belgian weekly news magazine, *Le VIF*, published its version in which the English authorities had recruited Godart specifically to improve weather forecasts. By implication he was leading the forecasters by the end of May, and it was to Godart that Tedder turned for the crucial forecast during the early hours of 4th June.

Thus are myths born - and spiral out of control.

Godart’s story is just one of many myths about the D-day forecast, all of which will be described in the fullness of time.

© B J Booth, Devizes, Wiltshire

---

**History Group – Occasional Papers**

We welcome proposals for subjects to add to our Occasional Papers series. These could be topics that are too lengthy and detailed for submission to either this newsletter or to *Weather*, for example. Since the first one was published in 1998, we have published 18, mostly written by members of the History Group. All are available to read online at [https://www.rmets.org/publications/occasional-papers](https://www.rmets.org/publications/occasional-papers).

The series is edited by Dr Howard Oliver. Expressions of interest can be sent to Julian Mayes ([Julian.mayes@meteogroup.com](mailto:Julian.mayes@meteogroup.com)) and he will forward them to Howard.

*Howard Oliver, Swanage, Dorset*

---

**Edmund Halley’s third voyage in The Paramore**


By Edmond Halley Commander. Anno 1701.

June 14. I fell down from Deptford with the Afternoon Ebb and at night came on to an Anker off Gravesend, wind WSW a steady gale”

So begins Edmund Halley’s account of his final survey voyage in the *Paramore*. His 1699-1700 voyage, described in a previous Newsletter, was to map magnetic variations in the Atlantic, but on this occasion he was to chart the tides and sea depths around the Channel area. A task which took him four months to complete. As his orders stated: "Whereas his Majesty’s pink the Paramore is particularly fitted out and Put under your Command that you may proceed with her, and observe the Course of the Tydes in the Channel of England, and other things remarkable you are therefore hereby required and directed to proceed with the said Vessel and use your utmost care and Diligence in observing the course of the Tydes accordingly as well in the Midsea as on both Shores As also the Precise times of High and Low Water of the Sett and Strength of the Flood and Ebb, and how many feet it flows, in as many and at such certain places, as may suffice to describe the whole. And whereas in many places in the Channell there are Irregular and half Tydes you are in particular Manner to be very careful in observing them”.

The work involved making detailed observations of sea depths, currents and tide heights both from the ship and by landing on shore. Most detail was obtained for the English Channel but some measurements, and the final published
charts, extended from Cromer to Cardigan Bay along the England-Wales coasts, Dublin to Cork in Ireland and from beyond Ostend to St Malo along the Continental coastline. Special attention was given to charting the sea depths and safe routes around dangerously shallow areas.

Halley was obviously a fast worker, as, only a month after his return on 10 October, an entry in the Royal Society Journal Book (Vol VIII, P 279) for 12 November 1701 states: “Mr. Halley shewed a new Draught of the English Channel of England, as lately observed by him And the Motion of the Sea thereof”. [this was probably the manuscript of the main Channel Chart which was not published until May 1702]. What Halley had achieved was recognised as providing an important advance in navigation safety and on 20 April 1702 the Lords Letter Book records: “It being her Majesty’s Royal Will [Queen Anne who ascended the throne on 8 March on the death of William III] and pleasure that the sum of two hundred pounds should be paid to Captain Edmund Halley [over and above his pay] as a reward to him for his Extraordinary pains and care he lately tooke, in observing and setting down the Ebbing, and Flowing, and setting of the Tydes in the Channell and bearing of the head-Lands on the Coasts of England and France”.

Both the entire log of the voyage and very many associated letters, plus large versions of the charts, are available in the 1980 Hakluyt Society book “The Three Voyages of Edmund Halley in the Paramore 1798-1701” which can be obtained through the usual web sites.

Howard Oliver, Swanage, Dorset

---

**Viewpoint: Right and wrong with Hadley**

Had it not been for German meteorologists, we would perhaps never have heard about the British meteorologist George Hadley (1685-1768). But in 1835 Heinrich Dove (1803-79) presented his "Wind Law" which at the time made the same impact on the world's meteorological community as Hoskins, McIntyre and Robertson's review in QJ 1985 on potential vorticity: *Now everything seemed to be explained!*

However, in 1837 the renowned British scientist John Dalton discovered that Dove's explanation of the Trade winds was identical to what was said in a paper presented to the Royal Society in 1735 by Hadley. This caused some embarrassment on the German side and until the death of Heinrich Dove the Trade wind explanation was called "The Hadley-Dove Principle", thereafter plainly "Hadley's Principle".

In spite of Hadley's Principle being heavily criticised from 1851 (by William Ferrel) to 2009 (by me in *Weather*) it has survived and is still the most popular "explanation" not only of the Trade winds but of the deflective mechanism of the Earth's rotation in general. It is much thanks to this popular explanation that the British climate centre was named the "Hadley Centre"\(^1\). Defending Hadley and his "Principle" against critical foreigners seems to have become a patriotic duty.

*But there is nothing wrong with Hadley; he was a great scientist, ahead of his time and there is no harm in naming this excellent climate centre after him. But, on the other hand, there is no need to follow him when he was wrong. The Poles and Germans may be proud of Copernicus, but their astronomers do not feel*

\(^1\) Raymond Hide (personal communication) would have preferred the name "Jeffreys Centre" after Sir Harold Jeffreys (1891-1989).
obliged to accept his original heliocentric solar system model with awkward epicycles to account for the non-spherical motions of the planets.

Figure 1: Copernicus's attempt to explain the non-circular form of the planetary orbits by invoking epicycles (circles in circles) is today forgotten by all scientists admiring his pioneering work.

What is "Hadley circulation"?

On the other hand, modern meteorological literature has coined the word "Hadley circulation". It is supposed to stem from George Hadley's 1735 paper and depict the atmospheric circulation as a (direct) circulation, with warm and moist air rising around the equator, flowing poleward in the upper troposphere and then, while cooling, sinking in the polar regions and returning as a northerly or rather north-easterly wind towards the equator.

We are taught that the reason this hemispheric "Hadley circulation" is not there is because the air is cooled already at about 30° latitude, starts to sink and then give rise to the subtropical high pressure belt with clear skies and dry weather. This is the explanation you will find in most books, also in some academic ones.

This explanation, however, is more or less exactly what George Hadley put forward in 1735. After his exposure of how the air has risen in the Tropics he explains how it is moving poleward:

"Being got up at a Distance from the Surface of the Earth, it will soon lose great Part of its Heat, and thereby acquire Density and Gravity sufficient to make it approach its Surface again, which may be supposed to be by that Time "tis arrived at those Parts beyond the Tropics where the westerly Winds are found".

But Hadley in 1735 never imagined an Equator to Pole circulation, but one that would have its first circulation cell, even if he never mentioned the word "cell", end at the mid-latitudes. He also envisaged that the upper air, when returning to the surface of the earth, would thereby become a westerly Wind."
Figure 2: Edward Lorenz’s 1967 WMO monograph on the general circulation of the atmosphere gives the impression, both in the text and in an illustration, that Hadley envisaged an equator to pole direct circulation where the return flow would be north-westerly on the northern hemisphere (south-easterly on the southern).

This point is important to make, not only to enhance Hadley’s scientific reputation, but also to show that the standard explanation of the westerlies has not come much further than in 1735. This might have been rather embarrassing, also in 1967, and might be the conscious or unconscious motivation for Lorenz to misinterpret Hadley’s 1735 account - which he was very familiar with.

Because the problem with Hadley’s explanation, already identified by sceptical British meteorologists in the late 19th century, is that the regions around latitude 30° are among the hottest, if not THE hottest places on earth. Nothing seems to easily cool there.

Anders Persson, Uppsala, Sweden
2016 MEMBERS

Rob Allan (Exeter)
Alberto Ansaloni (Milan, Italy)
Catharine Bailey (Richmond, Surrey)
Hannah Barrett (Sheffield)
Graham Bartlett (Slough)
Austen Birchall (Exeter)
Rodney Blackall (Buckingham)
Brian Booth (Devizes, Wiltshire)
Ron Bristow (Maidstone, Kent)
Tony Brown (Exeter)
Stephen Burt (Stratfield Mortimer)
Anna Carlsson-Hyslop (Manchester)
Jacqueline Carpine-Lancre (Beausoleil, France)
Mike Chapman (Nuthampstead)
Andrew Cook (Newport on Tay, Fife)
Stan Cornford (Hayling Island)
Maurice Crewe (Watford)
B D Dagnall (Lymington)
Stephen Davenport (Indianapolis, USA)
Peter Davies (Reading)
Tony de Reuck (London)
Federico de Strobel (La Spezia, Italy)
Margaret Deacon (Callington)
Storm Dunlop (Chichester)
Philip Eden (Luton)
Tom Fitzpatrick (Glasgow)
Chris Folland (Exeter)
Paul Fuller (Southampton)
Robert Gilbert (North Chili, NY, USA)
Brian Giles (Auckland, New Zealand)
Roger Goodhew (Shrewsbury)
John Gould (Southampton)
John Goulding (Middlesborough)
Valerie Green (Bushey)
Richard Griffith (Horsham)
Margaret Haggis (Cuxton, Kent)
Alan Heasman (Marlborough, Wiltshire)
Althea Howard (Reading)
A M Hughes (Oxford)
Lord Hunt of Chesterton FRS (London)
Jane Insley (London)
Geoff Jenkins (Yateley)
Alexandra Johnson (London)
Arnold Johnson (Maidenhead)
Keith Johnson (Twatt, Orkney)
Simon Keeling (Wombourne, Staffs)
Elizabeth Kent (Southampton)
Joan Kenworthy (Satley, County Durham)
John Kington (Norwich)
Daudu Kuku (London)
Richard Link (Croydon)
Allen Lock (Reading)
Norman Lynagh (Tideswell, Derbyshire)
Joyce MacAdam (Watford)
Julian Mayes (West Molesey, Surrey)
James Milford (Reading)
Eric Mills (Halifax, Nova Scotia)
Reg Milne (Farnborough)
Alison Morrison-Low (Edinburgh)
Howard Oliver (Swanage)
Alan O’Neill (Twyford)
Sara Osman (London)
Sarah Pankiewicz (Exeter)
David Peddley (Wallington)
Anders Persson (Storvreta, Sweden)
R W Phillips (Lincoln)
Peter Rackliff ( Fareham)
Nick Ricketts (Exmouth)
P R Rogers (Sevenoaks)
Catherine Ross (Exeter)
James Rothwell (Southwell)
Peter Rowntree (Crowthorne)
Marjory Roy (Edinburgh)
Andrew Russ-Turner (London)
Joan Self (Exeter)
Ann Shirley (Canterbury)
Hugh Thomas (Hurstpierpoint)
Derry Thorburn (London)
Keith Tinkler (Ontario, Canada)
Mairéad Treanor (Dublin)
Bill Wade (Harrogate)
Diane Walker (Tiverton)
Dennis Wheeler (Sunderland)
G D White (Truro)
Peter Wickham (Wokingham)
Clive Wilkinson (Diss)
John Wilson (Nottingham)
Sir Arnold Wolfendale FRS (Durham)
Mick Wood (Bracknell)

We welcome all offerings, from letters, to brief articles – it does not take long to write a short item – just drop me an e mail. Finally, I would like to thank all those who have contributed to this issue and the first issue of 2016. My contact details are as follows:

MeteoGroupUK, PA NewsCentre, 292 Vauxhall Bridge Road, LONDON SW1A
julian.mayes@metegroup.com

Julian Mayes, London, August 2016