History of Meteorology and Physical Oceanography Special Interest Group

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Newsletter 2, 2011

History Group members in the Library of the Scott Polar Research Institute. See page 11.

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SINCE RECORDS BEGAN
by Malcolm Walker

December 2010 was a very cold month in the British Isles. It was, in fact, the coldest December since 1890 in many parts of the country. So why was it stated so often in newspapers and on radio and TV that December 2010 was the coldest December since 1910, especially when December 1910 was actually quite mild?

Why did some commentators tell us it was the coldest December since records began? That was nonsense. The Central England Temperature (CET) series created by Gordon Manley extends back to 1659, and reliable temperature records began in many other parts of the British Isles long before 1910.

A similar thing happened over the April 2011 rainfall. We were told it was the driest April over much of Britain since 1910. Maybe it was, but what is so special about 1910?

Statements by the Met Office made clear that 1910 was the year national temperature and rainfall records began. Ah! So what is so significant about national records? The most obvious reason is that temperature and rainfall records are digitized back to 1910 and this allows the Met Office to calculate areal statistics of regional rainfall and temperature back to this date, including series for the whole of the UK. There sometimes seems to be a preference for quoting these UK statistics rather than the longer-established CET and EWR (England and Wales Rainfall) series, especially when dealing with media enquiries.

But what is the significance of 1910? Well ... responsibility for collecting and publishing British climatological data prior to the second decade of the twentieth century lay NOT with the Met Office but with the Royal and Scottish Meteorological Societies. When, in 1874, the Permanent Meteorological Committee, the forerunner of the International Meteorological Organizationôs International Meteorological Committee, requested climatological observations from fifteen ósecond-orderôstations in Great Britain, there was embarrassment for the Met Office because very few of their stations met the specifications for this type of station. The Royal and Scottish Meteorological Societies were able to supply the data, and did so for several decades.

Sir Napier Shaw proposed in 1905 that the Met Office should take over from the two societies responsibility for publishing their climatological data in a single publication. Agreement was reached with the Royal Meteorological Society in 1911 and with the Scottish Meteorological

Society in 1913. Publication of the Royal Meteorological Society's *Meteorological Record* ceased at the end of 1911 and the data hitherto published by the Society subsequently appeared in the Met Office's *Monthly Weather Report*. Scottish data were included in the *Monthly Weather Report* from January 1914.

At the very least, clarity is required over statements that include ñsince records beganò but it would be nice also to have the important roles of the Royal and Scottish Meteorological Societies recognized. The implication is that the data they supplied were not reliable. They were.

COMMENTS ON RECENT ARTICLES IN THE HISTORY OF METEOROLOGY GROUP NEWSLETTERS

by Brian Giles

In Newsletter 2010 No 3, Malcolm Walker mused on ñwhich old papers had been cited most in meteorologyò(Walker, 2010) and drew attention to the phenomenon of *obliteration by incorporation*. In the most recent Newsletter, 2011 No.1 (Walker, 2011), he reflected on textbooks in which he jumped from considering ideas in erudite original works to their translation into elementary textbooks. It struck me at the time that a good example of these is the extratropical cyclone model. This has appeared under various names over the years ï The Bergen School cyclone model, the Norwegian School cyclone model, the mid-latitude cyclone model, the polar front theory of cyclones and so on. According to Godske *et al* (1957), the work was carried out by V.Bjerknes and various collaborators between 1906 and 1948 at a variety of centres ï Stockholm, Oslo, Leipzig, and Bergen. Bjerknes (1918) started from the premise of the observed wind flow in a mid-latitude depression (Fig.1) which was very similar to that suggested by Shaw (1911). He then made an intellectual leap by adding boundaries to the wind flow regions ï and so the ófrontô was born.

The first published account was by Bjerknes (1918) and is shown in Fig.2, where the warm front is called a ósteering lineô and the cold front is the ósquall lineô Even this original reference is given in a variety of forms! In Godske *et al* (1957) it is referenced as *Geofys. Publ.,* Vol.1 No.1, 1919, 8pp. In Petterssen (1956), it is *Geofys. Publikasjoner, Norske Videnskaps-Akad. Oslo,* Vol.1, No.2, 1918. In Byers (1944), we have *Geofysiske Publ.,* Vol.1, No.2, 1918. Stringer (1972) has *Geofys. Publ.*, Vol.1, No.2, (1919). So there is confusion over the year ï 1918 or 1919 - and the volume ï No.1 or No.2. However, the rather poor diagram was improved

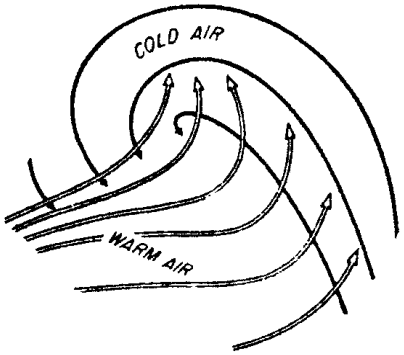


FIG. 12.1.3. Motion in the lower strata of a cyclone. (*After J. Bjerknes*, 1918.)

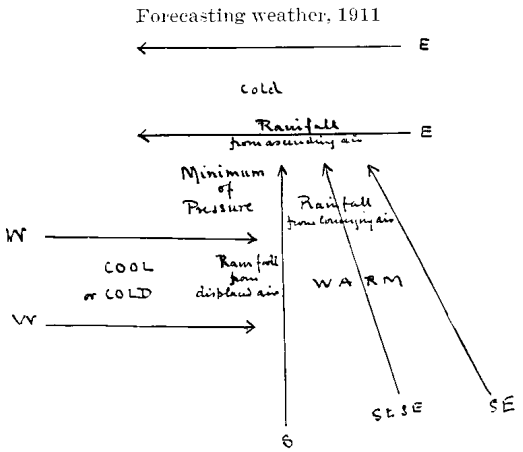


Fig. 88. Original sketch for the distribution of wind, temperature and rain with reference to the centre of a cyclonic depression.

Fig.1. The origins of the front from Bjerknes (1918) and Shaw (1911).

Fig.2. Bjerknes cyclone model, 1918.

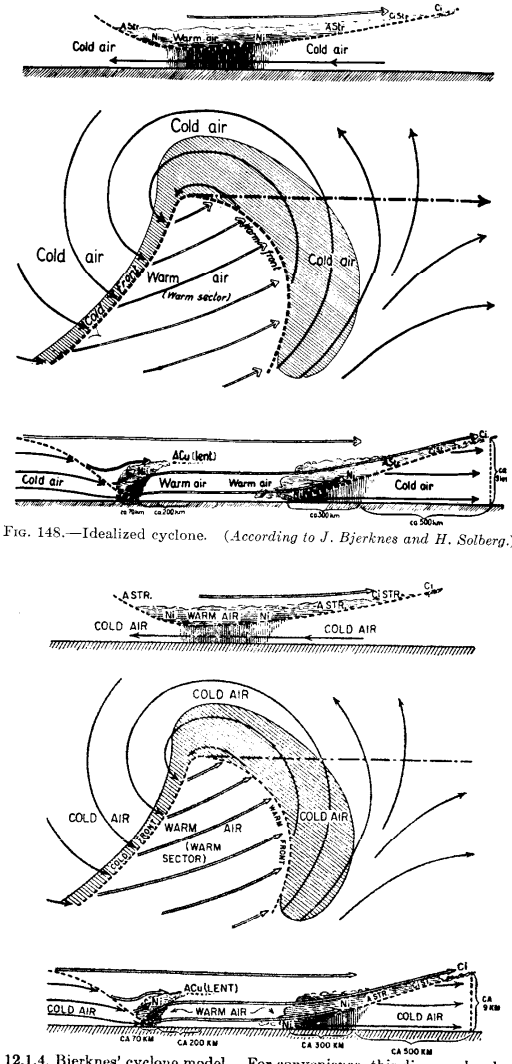


FIG. 148.—Idealized cyclone. (*According to J. Bjerknes and H. Solberg.*)

FIG. 12.1.4. Bjerknes' cyclone model. For convenience, this diagram has been reproduced from Bjerknes and Solberg (1921); it contains slight modifications as compared with the original model of J. Bjerknes, 1918.

Fig.3. Bjerknes cyclone model. Above from Petterssen (1940) and below from Petterssen (1956).

by Bjerknes and Solberg (1922) shown in Fig.3 and taken from Petterssen (1940 and 1956), where the word front is used. This is the diagram that is generally quoted and used either in its original form or redrawn in a variety of simplifications. It soon entered the university level textbooks and Bjerknes and his colleagues continued with their new methods of synoptic analysis and fine-tuned their cyclone model (Figs.4 and 5) which became the basis of many diagrams in university and school textbooks. Berry *et al* (1945) attributed Fig.5 to Bergeron (1937), but it could also have been attributed to Bjerknes (1937).

Meanwhile, in the textbooks by Byers (1944 and 1974) very similar (Fig.6, page 4) but unacknowledged diagrams appeared, although they did not change in the 30 years between the

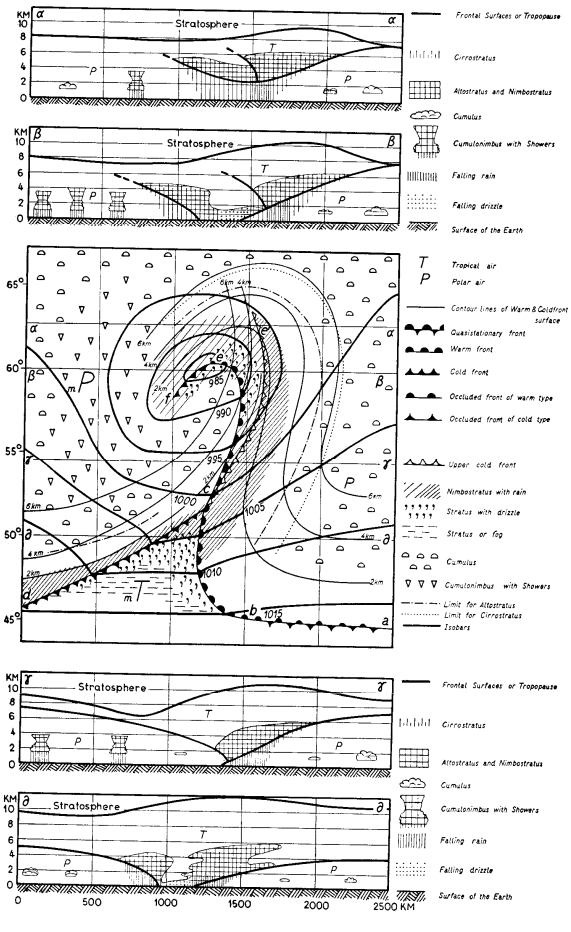


Fig.4, from Godske et al (1957).

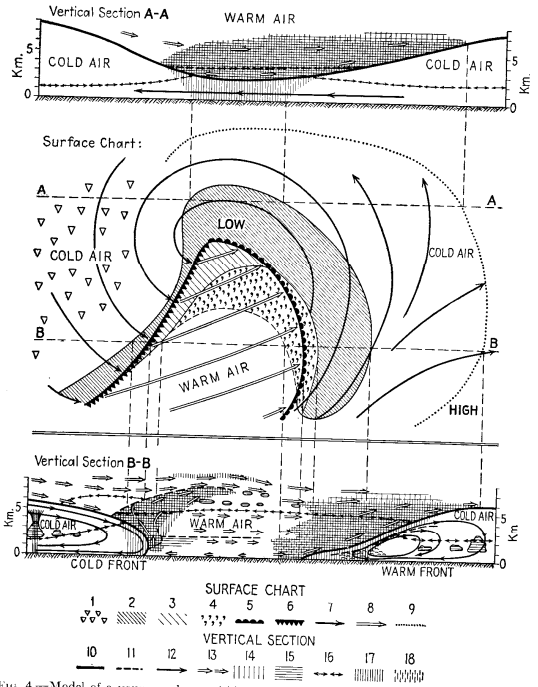


FIG. 4.—Model of a young cyclone. (*After Bergeron*, 1937.) Air motion in the vertical sections refers to a moving-coordinate system.

Surface Chart: 1, Shower; 2, rain area in cold air; 3, rain area in warm air; 4, drizzle area; 5, warm front; 6, cold front; 7, streamlines of the cold air; 8, streamlines of the warm air; 9, outer cirrostratus boundary.

Vertical Section: 10, frontal surface; 11, other discontinuity surface; 12, motion of the cold air relative to the center; 13, motion of the warm air relative to the center; 14, falling ice crystals; 15, suspended cloud particles; 16, lower ice crystal boundary; 17, rain or snow; 18, drizzle.

Fig.5. From Berry et al (1945).

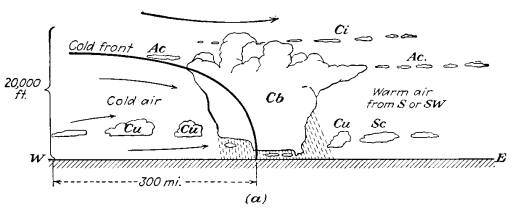


FIG. 146.—Idealized cross section through a cold front (*a*) and a warm front (*b*) in a matu cyclone.

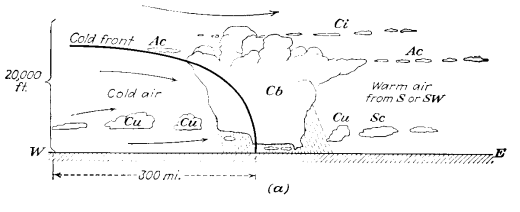


FIGURE 10-9
Idealized cross section through a cold front (*a*) and a warm front (*b*) in a mature cyclone.

Fig.6. Idealised cross sections of fronts from Byers 1944 and 1974.

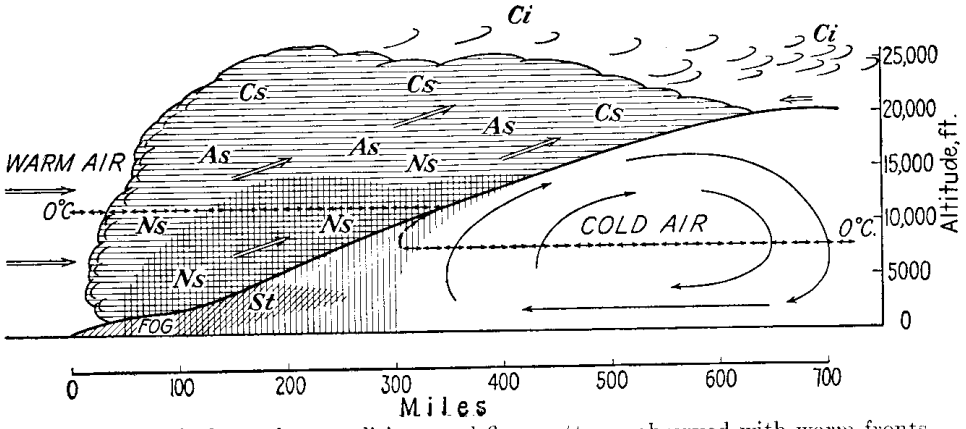


FIG. 8.—Typical weather conditions and flow patterns observed with warm fronts.

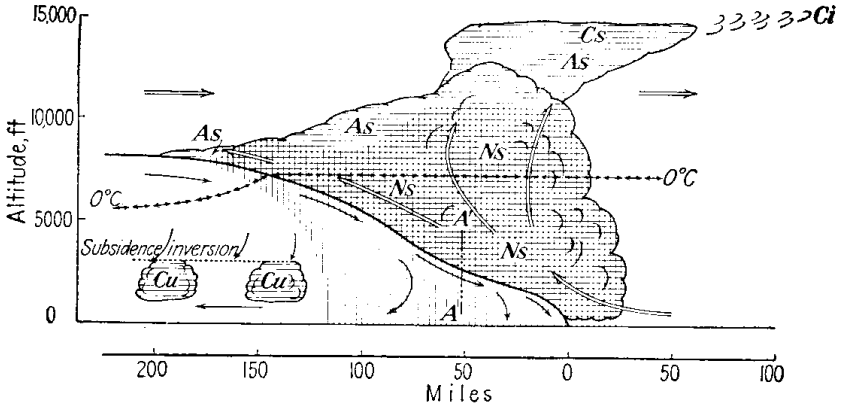


FIG. 11.—Type I cold front. (*After Bergeron*, 1934.)

Fig.7. Warm and cold fronts from Berry et al (1945).

first and fourth editions. Similarly, Berry *et al* (1945) reproduced the diagrams shown in Fig.7, but they only acknowledged the origin of the cold front diagram.

Thus, in 20 years the promulgators of the Norwegian cyclone model had been ǿbliteratedô Their model had taken off to such an extent it had become the norm. In England, the model was accepted somewhat grudgingly, probably due to the influence of Sir Napier Shaw, who had his own ideas. The frontispiece of *The Drama of Weather* (Shaw, 1939) has a northern hemisphere synoptic chart without a single front shown. In his Chapter 5, where the weather map is discussed, there are numerous Victorian diagrams taken from late nineteenth and early twentieth century papers, including those of Abercromby, Van Bebber and Shaw himself. Only towards the end of the chapter is

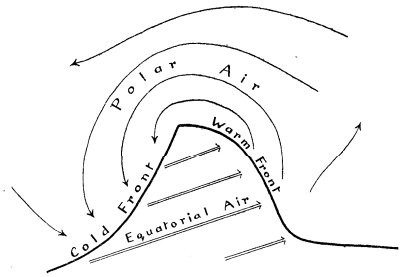


FIG. 2.—STRUCTURE OF A CYCLONE.

Fig.8, from Brooks (1927).

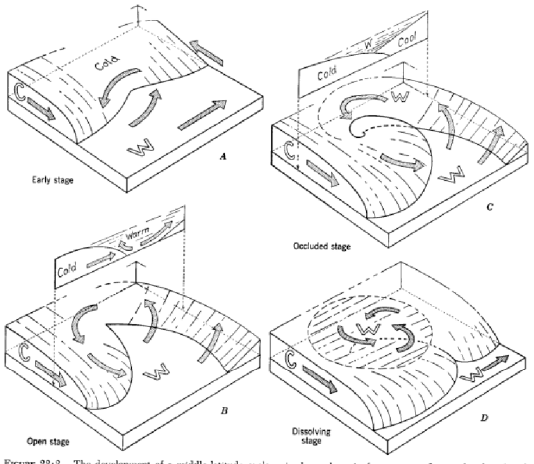


FIGURE 22·2. The development of a middle-latitude cyclone is shown here in four stages. It may be thought of as a horizontal wave in the polar front.

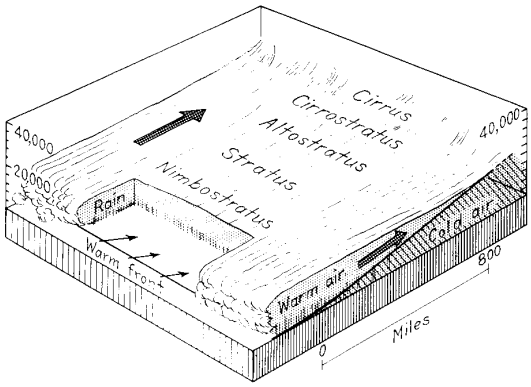


FIGURE 15.5. *A warm air mass is riding over cold air along this broad warm front.* [*From A. N. Strahler (1960).* Physical Geography, *New York, John Wiley & Sons.*]

Fig.10. Three-dimensional diagrams, from Strahler (1951) and (1960).

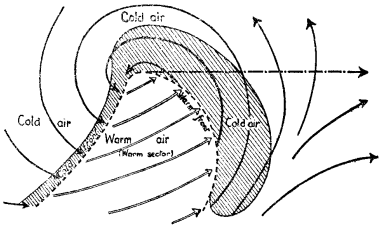


FIG. 12.—IDEALIZED DEPRESSION

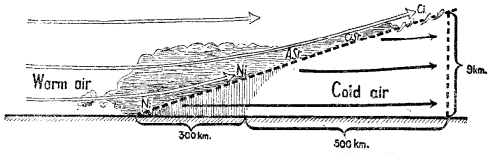


FIG. 13.—VERTICAL SECTION THROUGH A WARM FRONT

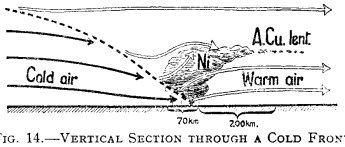


FIG. 14.—VERTICAL SECTION THROUGH A COLD FRONT

Fig.9, from Pick (1933).

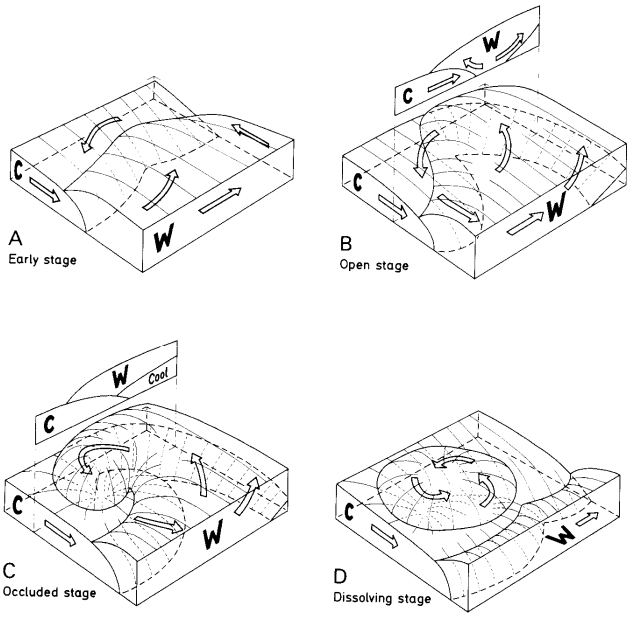


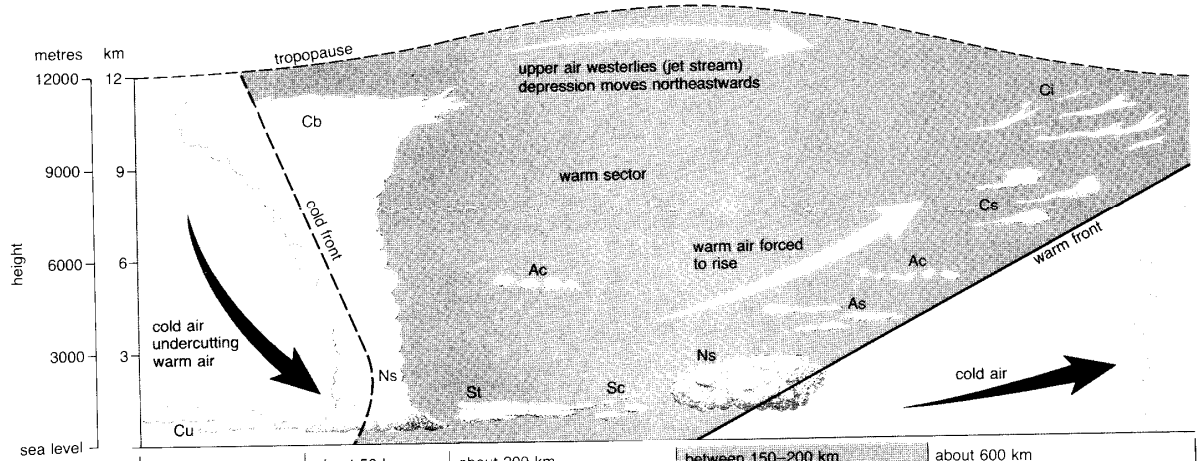
Fig. 4.7. Four stages in the typical development of a mid-latitude depression (*mostly after Strahler 1951, modified after Beckinsale*). Satellite views of the cloud systems corresponding to these stages are shown in fig. 4.8. C = cold air; W = warm air.

Fig.11. Mid-latitude depression model, from Barry and Chorley (1982).

the work of the Norwegians mentioned and Fig.3 reproduced but without a full reference.

Brooks (1927) included a very simplified version (Fig. 8) and it also appeared in Pick (1933) but redrawn (see Fig.9) with changed lettering and the cross-section split. With both Brooks (writing for an educated and enquiring audience) and Pick (writing a short course in elementary meteorology) we are moving from the realms of university research to first year undergraduate and school level.

So how did the diagrams fare. One could say that by the mid-1950s the original model had become cluttered with observational data (see Fig.4, page 3) and the simplicity of the original had been lost. Simplicity is the keynote for school textbooks, and another smaller intellectual leap was made by Strahler (1951), who re-drew the original diagrams in a three-dimensional form (Fig.10). Even he could not leave well alone and ten years later (Strahler, 1960) had added cloud types to the diagrams. He was not loathe to use his ideas and



Distance (km)		about 50 km	about 200 km	between 150–200 km	about 600 km
Weather	behind the cold front	passing of the cold front	warm sector	passing of the warm front	approach of depression
Pressure	rise continues more slowly	sudden rise	steady	fall ceases	steady fall
Wind direction	NW	veers from SW to NW	SW	veers from SSE to SW	SSE
Wind speed	squally — slowly decreases e.g. force 3–6	very strong to gale force e.g. force 6–8	decreases. e.g. force 2–4	strong, e.g. force 5–6	slowly increases, e.g. force 1–3
Temperature (e.g. winter)	cold. e.g. 3 °C	sudden decrease	warm mild. e.g. 10 °C	sudden rise	cool, e.g. 6 °C
Relative humidity	rapid fall	high during precipitation	steady and high	high during precipitation	slow rise
Cloud	decreasing in succession Cb and Cu	very thick and towering Cb	low or may clear St, Sc, Ac	low and thick Ns	high and thin — in succession Ci, Cs, Ac, As
Precipitation	heavy showers	short period of heavy rain or hail	drizzle or stops raining	continous rainfall (steady and quite heavy)	none
Visibility	very good, poor in showers	poor	often poor	decreases rapidly	good but beginning to decrease

Fig.12. Weather associated with the passing of a typical mid-latitude depression (Waugh. 1990).

reproduced them in subsequent publications (Strahler, 1963), always referring to his own publications and only mentioning Bjerknes who had ñbrought forward a new theory of mid-latitude weather which is sometimes called the *polar-front theory"*.

Strahlerôs new diagrams were reproduced in Barry and Chorley (1968), who mentioned that the word ófrontôwas ñproposed during the First World War by a group of meteorologists (including V. and J.Bjerknes, H.Solberg and T.Bergeron) working in Norwayò By the fourth edition of their textbook (1982) the diagram has changed slightly (Fig.11, page 5) and was attributed to ñafter Strahler 1951, modified after Beckinsaleòand it is still in the sixth edition (1992). Unfortunately, Beckinsaleôs input is not actually referenced. So the original diagrams of Bkjerknes and Solberg never really made it to school textbooks and the authors themselves were only mentioned in the text.

Indeed, the book by Waugh (1990), which was carefully aimed at the British A-level geography curriculum, does not mention the Norwegians by name but says ñThe Polar Front Theory was forwarded by a group of Norwegian meteorologists in the early 1920s. Although some aspects have been refined recently, since the innovation of radiosonde readings and satellite imagery, the basic model for the formation of frontal depressions is still validò

The accompanying diagram (Fig. 12) harks back to diagrams of the 1940s but with added in formation in the table beneath, and further explanation is given in the form of a surface isobar chart with fronts. Now although the diagram extends to the tropopause at 12km and is preceded by an explanation of Rossby waves, the two are not linked. The book falls into the trap I discussed nearly 40 years ago (Giles, 1972 and 1976). There I noted that it was ñthe step from the surface *pressure* chart to the upper air *contour* charts that is difficult for students to graspò It seems little has changed and Walker (2011) was correct in his pleas in his last two paragraphs.

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ADDENDUM TO THE PRECEDING ARTICLE

Researching the history of the foregoing publication was not easy from New Zealand. The following facts can be ascertained from the internet by Googling ñ*Geofysiske Publikasjoner*ò.

Its original title was *Norske videnskaps-akademi i Oslo. Geofysiske publikasjoner* and a list of contents shows that Volume 1 was published in 1921:

Geofysiske publikasjoner, *Geophysica Norvegica,* Volum I ï 1921. No. 2. J.Bjerknes: On the structure of moving cyclones.

But, according to the holding in the NIWA Library in Wellington, Volume 1 was actually published in 1919 although dated 1921.

The NOAA Central Library has a selected bibliography of both V. and J.Bjerknes. Here the ñon the structure of moving cyclonesòpaper gives:

Kristiania : Grøndahl & sons boktrykkeri, 1919. Issued by: Den Geofysiske Kommission. Series: *Geofysiske publikationer*; v. 1, no. 2.

The ñtheory of extra-tropical cyclone formationò paper gives:

Translated from German by P.F. Clapp, U.S. Weather Bureau. 1937. Translated from J. Bjerknes: *Theorie der aussertropischen Zyclonenbildung*. Met. Zeit, Haft 12, 1937, p. 462-466.

But *Meteorologische Zeitschrift* has renumbered its volumes since its inception in 1884. Volumes

3-55, No 3 (Jan 1886-Mar 1938) were also called Bd. 21-73, Heft 3 of Zeitschrift der Österreichische Gesellschaft für Meteorologie.

Finally, reference to the National Academy of Sciences Biographical Memoir (by Arnt Eliassen) on Jacob Aall Bonnevie Bjerknes in 1995 includes the diagram from the 1919 paper and in the óSelected Bibliographyôlists:

1917 - Über die Fortbewegung der Konvergenzð und Divergenzlinien. Meteorol. Z. pp. 345-49.

1919 - On the structure of moving cyclones. Geofys. Publ. I(2).

1923 - With H. Solberg. Life cycle of cyclones and the polar front theory of atmospheric circulation. Geofys. Publ. III(1).

1937 - Theorie der Aussertropischen Zyklonenbildung. Meteorol. Z. 54(12):462-66.

The first of these papers (1917) is interesting in the present context because it is not usually mentioned in the literature. Translated the title is ñOn the progression of convergence and divergence linesò I have not seen this paper but it might be worth a look if it is available in the National Meteorological Library.

So to recap. The ómoving cyclonesôpaper should be referenced as 1919 not 1918 and it is Vol.1, No.2. So Stringer was the only one to get the correct referencing.

REMINISCENCES OF LERWICK
by Tom FitzPatrick

When Churchill and Roosevelt met at sea somewhere off Iceland in 1940, RAF Coastal Command aircraft from Wick helped provide air cover for the ship carrying the Prime Minister. The USA had not yet declared war on Germany. The meeting resulted in a joint statement that came to be known as the Atlantic Charter and found final shape as the United Nations Charter.

When Germany invaded Russia on 22 June 1941, secure communication had to be established between London and Moscow. A possible route was via the North Cape of Norway to Murmansk. A flying-boat base was set up at Sullom Voe in the Shetland Islands, with living accommodation for all personnel provided in the first instance on a ship moored in the Voe.

In October 1941, I was posted from Wick, where I was on the forecasting roster, to join J.K.Bannon, the Met-Officer-in-charge. I remained there till August 1942. At first we had to divide the 24 hours duty between us.

Operations from Shetland consisted of flying-boat anti-sub patrols over the vast sea area between Iceland and Norway, and anti-shipping patrols by Blenheims from Sumburgh across the North Sea and along the Norwegian coast. For the area north of 60°N, forecasters had to make do with weather observations received with difficulty and at irregular intervals from a handful of widely separated points, at Iceland, the Faeroes, Jan Mayen and Bear Island.

Observations from Shetland and data provided by the Observatory at Lerwick were vitally important for flying operations everywhere. Lerwick Observatory was one of the first centres in Britain to provide radiosonde upper-air observations, essential for forecasting wind speed and direction at high levels. In charge at Lerwick was Oliver Ashford, who had been a fellow student with me in the Nat.Phil. class at Glasgow University. It was a pleasure to note his name in the membership list of the History Group of the Royal Meteorological Society.

When a third member of staff, F/O Lloyd arrived at Sullom Voe, time was found to allow me to visit the Observatory. I travelled the thirty or so nautical miles on an RAF pinnace. I found that at the Observatory the radiosonde system was just being set up. I accompanied Oliver on a walk over moorland, the object of which was to locate a trig point where one of the direction-finding stations would be located. That done, in a nearby cottage we met its only inhabitant, an old lady aged 84, who had lived all her life there and had never been as far as Lerwick.

Communication between Sullom Voe and Coastal Command 18 Group HQ at Pitreavie in Fife was difficult. Sullom Voe was a Type 2 met station, with authority to issue its forecasts independently, and had overall responsibility for information issued at Sumburgh, done in regular consultation with the met men there.

From the 9th till the 12th of November 1941, a SSEôly storm that reached 130 mph at its peak lashed Shetland. Four Catalinas, half the squadron strength, sank at their moorings. At the enquiry that followed, met officers were completely exonerated.

In January 1942, Britain, the USA, China and the USSR signed a United Nations Declaration accepting the principles of the Atlantic Charter. Catalinas from Sullom Voe began to patrol the convoy route from Shetland round the North Cape of Norway as far as Murmansk. As 1942 progressed, RAF activity in northern waters and the Arctic region increased.

A number of reconnaissance flights were carried out by one Catalina of 210 Squadron, flying from

Sullom Voe to Spitzbergen, a round trip of 2,400 miles. Landings had to be made in Spitzbergen Fjord, risking damage from floating ice. Fuel had to be carried from base. Adverse winds could spell disaster. There was only one possible alternative landing place, at Akureyri Fjord on the north-east coast of Iceland.

Choosing suitable weather conditions was a *sine qua non* for the success of these operations. Between April and June 1942 eight flights were made, captained by F/Lt ðTimô Healy, in an aircraft stripped down to allow the addition of long-range tanks. One flight turned back because of adverse winds; another was diverted to Iceland. The others were carried through successfully.

REFERENCE

An account of Coastal Command operations in northern waters is given in *Weather and War*, by T.A.FitzPatrick, Pentland Press, 1992.

SOME REMINISCENCES OF WEATHER AT FARNBOROUGH
by Reg Milne

My first months at Farnborough were memorable. I was posted to R.A.E. in the autumn of 1946 and so experienced the winter of 1946-1947. The RAF Mess was unreconstructed 1912, allegedly intended for India, bungalow and verandah, with single brick walls and ill-fitting wooden windows. The electrical wiring would cope only with 100 watts before the fuse blew. The rooms each had a small fireplace and no other form of heat. Coal was rationed to one small bucket a week. We shared, two to a room, and the water in our tin sink with bucket on its wooden collapsible stand was frozen on many mornings. There was coke for the fire in the batman's room but lighting it in a small open grate was difficult. Even Wing Commanders could be seen coming back from the airfield dragging odd bits of tree or timber that might have fallen off the back of a truck.

After 1948, the SBAC Air Show was held at Farnborough and weather did interfere on occasions.

It used to be annually in the first week of September, which I used to think of as the time of the equinoctial gales. In two successive years gales severely damaged the big exhibition tent, luckily not during the week of the actual Air Show but during the dismantling process. The following year, a checkerboard screen was erected around the area of the tent before the tent itself was put up. The scheme was designed by an ex-R.A.E. Deputy Director who was an aerodynamicist, and there was no more trouble from gales.

On one day the clouds were down to the ground and forecast to stay down. At 12:30 flying was cancelled for the day. At 1:30 the sky cleared, the sun came out and the weather was perfect for the Show but the pilots had taken advantage of their firms' hospitality and so there was indeed no flying.

Another occasion had low cloud and moderate visibility so all the aircraft flew except the Gloster Javelin and the DH 110, which were the ñAll-weatherò fighters!

Perhaps the most newsworthy occasion was in the 1960s when for one week the runway length was restricted because there were fish swimming about on the western end which had been flooded when the Basingstoke Canal burst its banks after plenty of rain.

In the last ten years, there have been two squalls, one of which removed some garage roofs and chimney pots in Cove and the other did the same in Farnborough Park. I experienced the second one while sitting and reading one afternoon and it was quite frightening. The sky went dark and the wind screamed round the house. Bits of trees and corrugated plastic roof flew across the garden and I expected to have to replace tiles from our roof. In fact we suffered no damage but garages 300 yards away were not so lucky.

A nice story ï nothing to do with the weather ï occurred during World War One, just to the West of the Black Sheds which are next to Trenchard House. Two people, whom you may recognise, Lt.G.I.Taylor and Lt.Melville Jones, were testing some ñFlechettesò These were steel arrows which were intended to be dropped in bunches from aircraft and which were expected to be able to go right through a soldier's helmet and body and even the horse he was riding. Taylor and Jones were dropping bunches from a balloon or aircraft onto the grass. The easiest way to plot the spread of a bunch was to put a sheet of paper over the tail of each one on the ground and then take a photograph from the air. On this particular occasion Melville Jones had put the paper markers in place and was waiting whilst the aircraft was preparing to photograph the scene when two Army officers rode by, exercising their horses. They asked what was going on and when told, one exclaimed ñI wouldn't have believed it ï every one a hit!ò G.I.Taylor and Melville Jones both went back to Cambridge after the War and became professors there.

THE BRITISH ANTARCTIC EXPEDITION 1910-1913: THE METEOROLOGICAL VIEW – PART IV
by Alan Heasman

As outlined in Parts I to III (Newsletters 2 and 3, 2010 and 1 of 2011), Captain Scott and his 31 colleagues of the British Antarctic Expedition (BAE) had sailed from the UK via New Zealand to establish base camp at Cape Evans on Ross Island in January 1911.

Before the southern polar winter began in May 1911, many meteorological observations had already been made during initial sledging trips and at the base camp under the leadership of George ôSunny Jimô Simpson, the BAEôs meteorologist.

By late May, with the exception of the Northern Party based at Cape Adare (see Part III and below), the BAE members were safely settled in the relative comfort of their Cape Evans hut, where they would remain throughout the long polar winter until September, when further preparations would be made before the main South Pole party set out in late October. But Simpson in particular had no time to get bored. He used meteorological data from Scottôs 1902 and Shackletonôs 1907 expeditions together with data just obtained by the BAE, to offer his best advice to Scott about the weather expectations on the main polar journey and most importantly conditions on the Ross Ice Barrier during February and March, when Scott expected to be returning from the Pole in early 1912.

BAE members still had to emerge from the Hut into the continuous black polar night ôin all weathersô to make weather observations. It was dangerous work. One observer, setting out to read the temperatures at the out-lying screen ôArchibaldô about three-quarters of a mile from the hut, in near blizzard conditions, soon became disorientated. He eventually staggered in several hours later, frost bitten but lucky to have survived. Typically, air temperatures at Cape Evans were Minus 30 to Minus 50 deg F with significant wind. The MEAN air temperature at Cape Evans in July was Minus 19.6 deg F and in August Minus 20 deg F.

Also through the winter, meteorological and other geophysical observations continued including magnetism, atmospheric optics and electricity and gravity evaluations. Also during this time the famous ôWorst Journey in the Worldô took place, when Dr Edward ôBillô Wilson, the chief scientist of the BAE, Henry ôBirdieô Bowers, a stalwart of the BAE, and Apsley ôCherryô Cherry-Garrard, the Assistant Zoologist, made their incredible trek to Cape Crozier to collect Emperor penguin eggs! On the outward journey, temperatures were regularly Minus 50 to Minus 60 deg F and occasionally Minus 70 deg F; the lowest minimum was Minus 77.5 deg F (109 Fahrenheit degrees of frost). All they had for shelter en route was a canvas tent. As Scott later noted, ôno civilised being has ever encountered such conditions before with only a thin canvas tent ...for shelterô It was not just the air that was bitterly cold; everything they had and touched was just as cold so that sleeping, cooking, pitching camp etc., was excruciating work. The 67 miles from Cape Evans to Cape Crozier over severely ridged ice took 19 terrible ôdaysô They experienced ferocious blizzards for several days and temporarily lost their tent which they needed for the return journey. Their return journey was just as bad, with stronger winds and temperatures mainly between Minus 20 and Minus 40 deg F. They arrived back at Cape Evans on 1st August 1911. Incredibly, throughout this ordeal they maintained their weather observations, measuring the air temperature with a sling thermometer, estimating the wind and other data. All these details are preserved in their pocket weather register, retained as part of the collection of BAE meteorological data at the National Meteorological Archive at Exeter. The most graphic description is in Cherry-Garrardôs famous book ôThe Worst Journey in the Worldô, published in 1922 and still in print today. Even after this gruelling ordeal, ôBillô Wilson and ôBirdieô Bowers were chosen as the main companions of Scott on the trek to the South Pole and both perished on that fateful return journey.

Also through the polar winter, the six men of the ôNorthern Partyô were isolated 500 miles from Cape Evans in their hut at Cape Adare. They too maintained a strict routine of weather observations every TWO hours ôday and nightô (relative terms!). They were surprisingly well equipped but lacked an alarm clock. So as not to over-sleep and miss observations, one of the party, Frank Browning, invented an ingenious device nick-named the ôCarusophoneô. Made from a bamboo rod under tension, a calibrated burning candle, a thread and a pre-wound gramophone, the device was set to burn through the taut thread two hours from the preceding observation, releasing the catch of the gramophone which then played the ôFlower Songô from Carmen sung by the famous tenor Caruso at full volume. Enough to wake any sleepy observer!

Thus, the whole BAE team awaited the return of the sun in late August 1911 and planned for more depot laying journeys and expeditions in

the early polar Spring of September and October 1911, including the main trek to the South Pole. Similarly, Amundsen and his team were at their winter base of 'Framheim', some 400 miles east of Cape Evans on the edge of the Ross Ice Barrier, planning their 'race' to the South Pole.

MEETING REPORT
by Maurice Crewe

Report of the meeting held on Saturday 28 March 2011 at the Scott Polar Research Institute, Cambridge. The meeting marked the centenary of Captain Scott's 1910-1913 expedition to the Antarctic.

A few of us who arrived early were able to take advantage of the limited parking – first come first served, and were invited to go for a walk until the Museum opened at 10 o'clock.

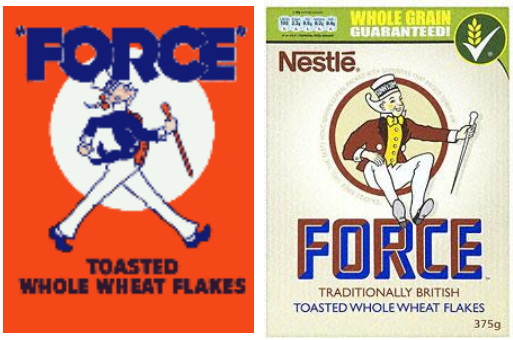
After the general arrival and coffee our chairman **Malcolm Walker** opened the proceedings sharp at 11 o'clock and **Joan Kenworthy** then said a few words, quoting Sir Arthur Quiller-Couch, in a lecture on 12 February 1913, aimed at persuading undergraduates that literature was an art to be practised. Among other things he said "but you have seen this morning's paper: you have read of Captain Scott and his comrades, and in particular of the death of Captain Oates; . . .' and added 'Gentlemen, let us keep our language noble; for we still have heroes to commemorate". This set the scene, for our meeting was to commemorate heroic explorers.

In his introduction, Malcolm mentioned that there were three descendants of George Simpson at the meeting – two granddaughters and a great-grandson – which added a little poignancy to the proceedings.

Alan Heasman gave the first talk, about the weather registers from the expedition, an interest started when he was in charge of the National Meteorological Library and Archive. He summarized the time scale of the expedition and emphasized that Captain Scott was very serious about the scientific aspirations of the expedition to the Antarctic.

There were some indications that Scott thought the science was more important than the journey to the South Pole, unlike Roald Amundsen, and possibly Shackleton, who gave the impression that the race to the Pole was the priority, with scientific exploration a subsidiary exercise.

With appropriate pictures AND packets of cereal, Alan illustrated Simpson's nickname of Sunny Jim. The wheat flakes became popular in the UK in about 1910 and are still available in 2011.



The main base of the British Antarctic Expedition (BAE) was Cape Evans on Ross Island, but weather observations were also recorded at three additional 'outlying screens' not too far away (see sketch from log book).

Sketch map in a log book.

In addition, weather records were kept on exploratory missions of varying duration, laying depots in support of the polar trek, and from the actual journey to the Pole. For example, the 'Northern Party' was away for some nine months. In all, there are some thirty original notebooks, plus at least one copy of the polar log book which was passed to Simpson with all the others so that he could check them and prepare the final meteorological report.

Alan had pictures of several of the log books (see page 12) and had catalogued the set numbered BAE 1-38, with numbers 1 to 8 the marine weather logs compiled on the *Terra Nova*, and 9 to 38 those based on land or ice. The latter covered different periods from 13 January 1911 to February 1912.

One of the log books.

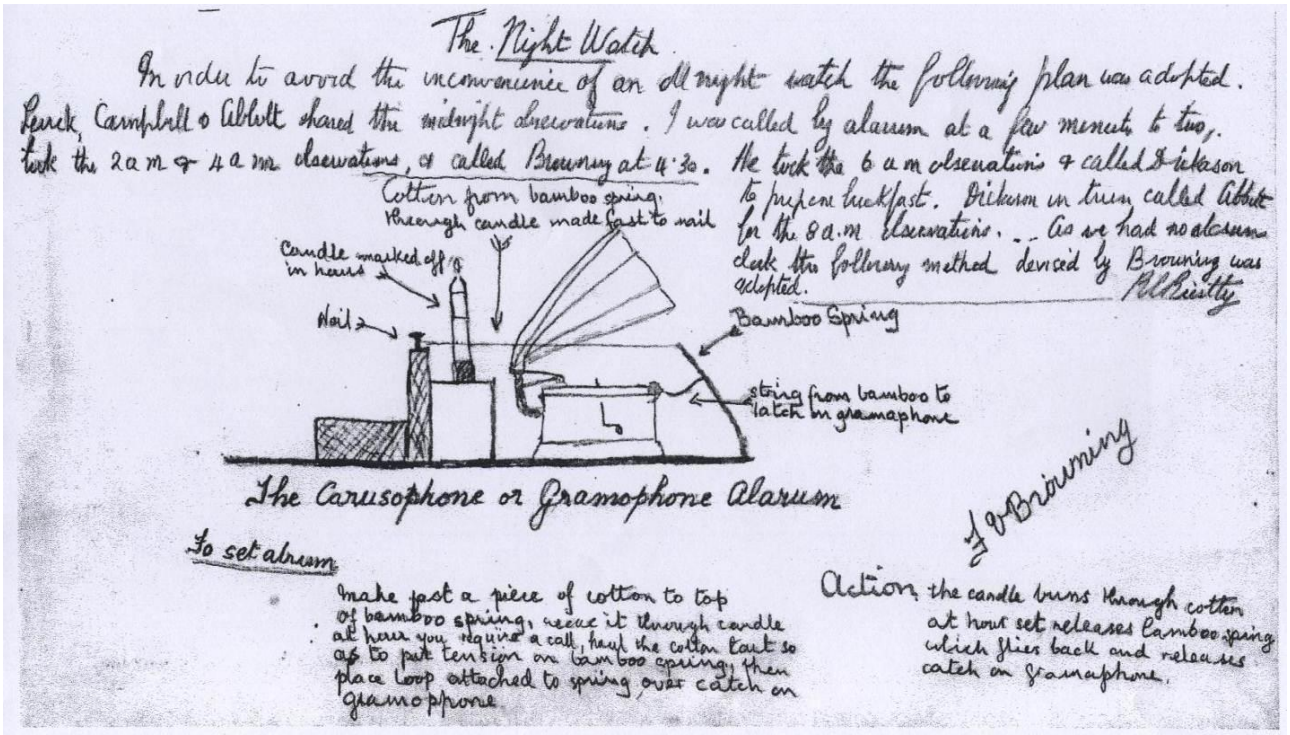
To maintain regular weather observations, an observer had to wake up during the night. As alarm clocks were unreliable when oils froze, they used an ingenious device called the Carusophone to avoid losing too much sleep. The diagram below is from one of the log books.

When the ôTerra Novaôreturned from New Zealand (late 1911/early 1912), Simpson had a letter telling him that Sir Gilbert Walker was too ill to continue working at the India Meteorological Department so despite being temporarily in charge at Cape Evans he returned with some log books, eventually to Simla. Ultimately, Simpson checked other log books and much tabulated data to prepare the three volumes *Meteorology*, which appeared between 1919 and 1923, technically published by the Committee for the Publication of the Scientific Results, for the British Antarctic Expedition 1910-1913. In 1921, Simpson became Director of the Meteorological Office, after being seconded from India for military service during the First World War.

Mick Wood then told us about Thomas Griffith (Grif) Taylor, BA, BSc, BE, Expedition Meteorologist. He was recruited as a geologist but because of past experience managed to get the Australians to pay him as a meteorologist too. Taylor worked in many parts of the world, finishing up in Canada as a highly respected scientific ex-explorer. Griffith Taylor and Mick never met, but their paths have crossed over the last 30 years.

Mick explained how serendipitous discovery of various papers in the Met Office Archive had sparked his interest in the Antarctic and his curiosity about Taylor. This interest made for an interesting story about a scientist, meteorologist and explorer better known in several parts of the world than in the UK, where he was born. Mick presented the story mainly in pictures with explanation, pointing out that there are many places where Taylor worked that Mick had visited, even as far south as Cape Evans. So paintings and photographs could be compared with then and now (almost), which certainly added interest. Compare Pontingôs picture of 1911 with Mickôs of 1998 (see page opposite).

Grif was always careful about money and was recruited as a physiographer (geologist) by BAE from whom he got £250, but because of work with the Bureau of Meteorology he got £310 as a meteorologist, plus £100 from the Melbourne *Argos* for twelve articles. In contrast, Simpson had to take unpaid leave from the India Meteorological Department.



Ponting's picture of 1911 (above) compared with Mick's of 1998 (below).

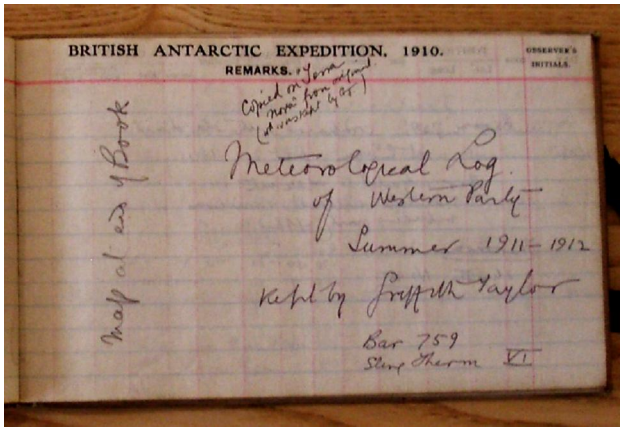
Taylor met the *Terra Nova* in Lyttelton, the harbour for Christchurch, New Zealand, to travel south, and we saw a picture of it in 2001 before it was destroyed in the recent earthquake.

One difference between January 1911 and February 1998 was that Taylor and others had to hump their kit, equipment and instruments across the ice. Simpson was the meteorologist but Taylor helped out with duties and supervision when Simpson worked away from base.

Mick's picture of the Erebus plume illustrates one of the signs used by Simpson in his research into the local and upper winds with different direction at times to surface wind.

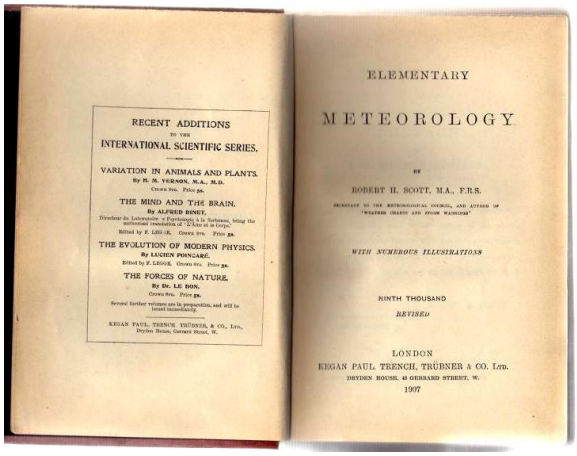
The Erebus plume.

As the weather log below shows, Taylor was leader and observer on two trips to Western Mountains Granite Harbour.



There was a glacier that Scott allowed to be called after Taylor, who as a geologist was allowed to collect rocks, but perhaps not as many as encumbered the polar party.

We saw a copy of *Elementary Meteorology* written by R.H.Scott and signed by Simpson in pencil on a flyleaf. Mick thought it was the copy used by Simpson for his lectures at Cape Evans, and Mick had even taken it with him on his visit to Cape Evans, where he took a picture of it on the table where it was probably used nearly a century before.



Griffith Taylor took charge of the meteorology when Simpson went on explorations and returned with him when he was called back early, so was of course mentioned in Simpson's books on the meteorology of the BAE.

Taylor returned to the Australian Bureau of Meteorology (BoM) after Antarctica where he collaborated with Henry Ambrose Hunt (Director of the BoM 1908-1931) on the first book on the climate of Australia. But he eventually fell out with the authorities, mainly over rainfall and white settlement of Australia, and left to enter academia, becoming first professor of Geography at Sydney University and then Toronto University.

A little after 12 o'clock, the audience was split into two parties, one to be shown round by the Museum Project Manager, Bob Smith, and the other to see the Library and Archive with Heather Lane, the Librarian and Acting Keeper of Collections (archives, pictures etc.). After lunch, the two parties changed over to complete the staff presentations.

The museum features artefacts (particularly from the Heroic Age of Exploration, basically 1897-1922), pictures and other material relating to polar history, exploration, science and art.

The tour started under the domes (only one illustrated, below) and included a summary of the history of the Scott Polar Research Institute from its foundation in 1920 as a national memorial to Captain Scott and his companions, who died on their return journey from the South Pole in 1912. When Scott's last words, "For God's sake look after our people", were made known to the British nation, the response was tremendous. Scott himself had emphasized the importance of science, and from this plea, the Institute was born.

The first Director was Frank Debenham, who was a member of Scott's team as a geologist and became Emeritus Professor of Geography at Cambridge University.

The Institute investigates issues relevant to the Arctic and Antarctic in the environmental sciences, social sciences and humanities. In fact, it is concerned with almost everything to do with the colder parts of the world. The displays are mostly geographically grouped. In addition to the polar regions, there is a section on searches for the North West Passage, the Inuits of northern Canada, and the Europeans who regard the Arctic regions as home.

The library is almost certainly the most comprehensive polar research and archive centre in the world. It is a World Data Centre for Glaciology, and, since 1998, the collection has been housed in the Shackleton Memorial Library, which in 1999 won a regional award from the Royal Institute of British Architects. The Library and Archive was and is still used by practically everyone who has ventured into the remote cold areas – even modern TV "adventurers". We were able to see and handle, sometimes with white gloves on, a selection of relatively rare books and records; and some of the remarkable pictures: superb photographs taken by Herbert Ponting and paintings by Edward Wilson – paintings so good that many were reproduced as high-quality prints.

Some of us recognized the similarities between the Scott Polar library policies as a world leading subject specialist centre and the National Meteorological Library and Archive.

After the second of the tours, **Malcolm Walker** gave us a presentation about the scientific work of George ('Sunny Jim') Simpson during Scott's last expedition. Simpson gained a First Class Honours degree in physics and after a lectureship in meteorology at Manchester University and research for the Meteorological Office, became, in 1906, the Imperial Meteorologist to the India Meteorological Department, based at Simla. In addition to basic meteorology, he was interested in, and involved with, many aspects of atmospheric science. He took this breadth of interest with him to the Antarctic when he accepted Scott's invitation to be the expedition's meteorologist.

Although Edward Wilson was technically in charge of the scientific staff, he tended to be busy painting or going on explorations, including to the Pole, so Simpson was often top scientist until he returned to India early due to the illness of Sir Gilbert Walker.

Malcolm offered more evidence of Simpson being regarded as Sunny Jim. It was not only some similarity in looks but of a genial and friendly disposition and a zealous approach to both sunshine and radiation measurement.

Being on unpaid leave was clearly a challenge to Simpson. People in Derbyshire, where he was born, raised £500 to cover some expenses, and in the first few months of 1910 Simpson "begged, bought, designed, manufactured and tested" instruments. He went to four countries to discuss what should be investigated, and also organized the loan of instruments from several meteorological services and instrument manufacturers. Once at Cape Evans, Simpson

not only set up observing sites but organized regular upper-air work with locally generated hydrogen and balloon-borne meteorographs which presented retrieval challenges. Some equipment that worked normally in temperate climates presented many problems in cold, blizzard conditions, so, with surface and upper-air instruments to keep working and calibrated, Simpson was very busy. He is commemorated by a glacier, a glacier tongue and a peak in the Scott Mountains named after him.

As part of the upper-air project, Simpson had to devise methods of retrieving the meteorographs. During the summer months, the balloons had a secondary red balloon, filled with air, attached to the recording instrument and when the hydrogen balloon burst the descent of the red balloon was tracked by theodolite and a bearing to its landing place taken. In the winter months, a very thin silk thread was attached to the recording instrument which could then be followed, sometimes for many miles. In all, Simpson made 21 balloon ascents, retrieving fourteen meteorographs. Two of the records were deemed unsatisfactory, giving a total of twelve successful balloon ascents.

The last speaker, **Tom Lachlan-Cope** of the British Antarctic Survey, considered ñScottôs last expedition ï scientific landmarkò

The question of what is a scientific landmark or legacy is difficult to define, but Tom explained how Scott brilliantly organized a scientific expedition which was clearly staffed by more scientists than Shackletonôs or Amundenôs expeditions. Tom then summarized the publications that came out of Scottôs expedition, from the first report in 1913 and several articles and scientific papers through to the three volumes of meteorology produced by Simpson in the period 1919-1923. Subsequent references and citations are surprisingly few considering the quantity of information collected by the team organized by Scott, Wilson and Simpson. Was it the decline in expeditions during and after the First World War that diverted attention away from the scientific data collected, or subsequent technological improvements? The implication is that the greatest legacy may not be the actual scientific data collected by Scottôs team but the importance placed on the scientific aspects of exploration and the good example of how that should be organized. There is now a fairly widely held view that the scientific side of the expedition more than compensates for the criticisms levelled at Scott for not winning the órace to poleô

The inevitable overlap between talks and tours failed to generate boring repetition but maintained the theme with views of the same object from different angles. In summarizing the proceedings, I may have distorted the balance of the speakersôpresentations for which I apologise.

Because several of the fifty who attended the meeting had trains to catch, the meeting finished fairly promptly at 4 pm and some of us realized that the day seemed to have passed rather quickly, which is a reliable indication that it was a well-organized and interesting day.

MEMORIAL TO LUKE AND MARIABELLA HOWARD
by Howard Oliver

Both Luke and Mariabella Howard were buried at the FriendsôMeeting House, Winchmore Hill, near Tottenham, in March 1864 and February 1852 respectively.

For a number of years there had been no sign of either gravestone. However, an old plan of the burial ground had survived which provided the original locations of their graves and those of other family members.

Luke Howard

Following the unveiling of the Blue Plaque to Luke Howard at Bruce Grove, Tottenham, in 2002, the family decided that they would also like to erect a memorial to Luke and Mariabella at Winchmore Hill.

Eventually, Mariabellaôs gravestone was located, lying flat and being used as a paving stone. This has now been re-erected close to the spot where they were both buried with Lukeôs name and date of death added.

Gravestone of Mariabella Howard

For further information please contact Richard Lloyd (richard.lloyd@wargrave.net).

CONGRATULATIONS

Congratulations to Professor Eric Mills of Dalhousie University, Halifax, Nova Scotia, Canada, winner of the 2010 Jehuda Neumann Memorial Prize. The prize was presented at the Awards Dinner of the Royal Meteorological Society on 29 June 2011 but Eric was unfortunately unable to receive the prize in person. The citation was as follows.

On the recommendation of the Committee of the Society's Special Interest Group on the History of Meteorology and Physical Oceanography, the Society awards the Canadian oceanographer and historian of science Eric L Mills the Jehuda Neumann Memorial Prize for 2010 for his recently published book on the history of scientific work on ocean circulation, The Fluid Envelope of our Planet: how the study of ocean currents became a science (University of Toronto Press, 2009). Eric is one of a rare species, having held chairs in both science and the history of science. The book begins with early ideas and controversies about ocean circulation in the nineteenth century and then describes the birth of dynamical oceanography in Scandinavia in the early twentieth century and how knowledge of this approach spread in different centres in Europe and North America, one consequence being the appointment of a Norwegian, H.U.Sverdrup, to head the Scripps Institution of Oceanography in 1936 and subsequent developments there, culminating in the important work of Henry Stommel and others after World War II. As with all Eric's work, this book is impeccably researched and written and is a definitive account of the subject.

CONGRATULATIONS ALSO TO HISTORY GROUP MEMBERS JULIAN MAYES AND BRIAN BOOTH

At the Awards Dinner on 29 June 2011, Julian received the Royal Meteorological Societyôs Outstanding Service Award and Brian received the Gordon Manley *Weather* Prize. Here are the citations.

Julian has been an active member of the Society for over 20 years, organizing meetings, contributing to specialist groups – he was the driving force behind the Association of British Climatologists for many years – and playing a very active part in Society publications. He has also shared his considerable enthusiasm for climatology and meteorology with generations of students during his years as a lecturer at the University of Surrey Roehampton, and more recently with his colleagues at MeteoGroup.

Julian Mayes took over the Editorship of the Society's leading-circulation title Weather *in October 2003. Under the six years of his Editorship,* Weather *went from strength to strength in the quality and quantity of submitted and published material. His Editorial tenure included three notable milestones – enlargement of the magazine to A4 format (January 2004), a move which significantly improved the readability and professionalism of the magazine; the 60th anniversary of* Weather *(May 2006); and, perhaps most significant of all, the successful transition to an external publisher, Wiley-Blackwell, in January 2007. Throughout his editorship, Julian continued to enthuse both his Editorial board and our publishers whilst driving forward many significant innovations, at the same time maintaining and improving the quality and quantity of contributions to the magazine.* Weather *is the Royal Meteorological Society's main communication vehicle for the majority of its membership, and stewardship of the title is therefore a vitally important role.*

At MeteoGroup UK, Julian, in his rôle as Head of Training, continues to be responsible for internal and external training courses, passing on his enthusiasm and experience to a whole new generation of weather forecasters. As part of his commitment to professional development at MeteoGroup, Julian has successfully introduced the NVQ in Weather Forecasting, culminating in MeteoGroup being accepted as a formal assessment centre for this NVQ in 2010, after Julian himself had qualified as NVQ Assessor.

Julian's exceptional contributions to the Society and to meteorology over many years fully justify this Outstanding Service Award.

AND HERE IS THE CITATION FOR BRIAN

Brian is one of the leaders in the field of historical meteorology. He has written frequently for Weather *on this topic, with detailed but concise material that, for many readers, evokes vividly the era of which he is writing. He has written often on the topic of weather and the wartime periods, including recent articles on World War I and the first RAF met flights. He received particular praise for a recent article entitled 'A Norwegian at ETA 1942-45', where he sought out and encouraged John Sundt (a Norwegian who worked in the Met Office's Central Forecast Office in Dunstable during the Second World War) to write up his experiences for the article.*

‘OLDWEATHER’
by Philip Brohan and Rob Allan
(Met Office Hadley Centre)

To anyone with a historical bent, there is a fascination in looking through old documents: original records from 100 years ago give a glimpse of a now alien way of life ï telling stories both of great events and of ordinary people now lost to memory. Surprisingly often, such records also contain information of interest to meteorologists - some even contain instrumental records of the weather at the time.

OldWeather.org is a project harnessing that fascination in the service of modern climate research. We are currently concentrating on Royal Navy ships' logbooks, a rich source of weather records: as every four hours, day and night, each ship observes wind speed and direction, present weather, barometric pressure, air and sea temperature; and records them carefully in the log. The ships move around the world's oceans as dictated by the Navy's operational requirements ï providing a stream of weather reports covering a wide area of the globe. There are very many logbooks to look at ï the National Archives has a collection of hundreds of thousands of Royal Navy logbooks, going back more than 300 years.

But turning the logbook archive from a potential source of information to an actual asset involves a lot of effort. Each handwritten logbook page has to be read, and the essential information typed into a computer database ï a task that is beyond the resources of any conceivable team of climate scientists. So we have photographed some 4000 Royal Navy ships' logbooks from the period around World War One (1914-23), put the photographs online, and recruited the help of more than 8000 volunteer citizen scientists in reading and transcribing the 1.5 million weather observations they contain. Citizen Science has proved a very powerful approach for rescuing these historical weather observations that would otherwise have remained untouched and inaccessible in the archives. In the eight months since launching the project we have completed more than two thirds of our original 4000 logbooks, and are collecting more ï from the UK, US, and possibly other countries.

To see for yourself, point your web browser at http://oldweather.org, sign-up, and pick a ship to look at. OldWeather is not just a science resource; we have found a wide range of interesting material in the logbooks, and the project blog and forums include enthusiastic discussions on naval activity and discipline, historical events, comet sightings and Spanish flu, as well as some analysis of the weather of the period.

The weather records recovered and digitised by OldWeather.org will be fed into the international data bases for historical weather observations. They will be freely available to all users, and will be used in the global reconstructions of past weather which underlie so many studies of climate variability and change.

MEETING REPORT
by Malcolm Walker

On 21 June 2011, twenty-two members of the History Group and South East Centre of the Royal Meteorological Society gathered in the Information and Learning Centre of the Thames Barrier at Charlton for a joint meeting on ôPlanning for coastal flooding: past and future North Sea surgesõ

History Group chairman **Malcolm Walker** welcomed everyone and then presented ôA brief history of surge flood events in the southern North Seaõ In this, he mentioned that the earliest record of a flood in London appears in the *Anglo-Saxon Chronicle*. The inundation occurred on 11 November 1099, when ñthe sea flood sprung up to such a height and did so much harm as no man remembered that it ever did beforeò

Malcolm went on to say that some parts of the Netherlands and some coastal areas of eastern England have proved especially vulnerable when storm winds have raised sea levels and generated huge waves. Coastal defences have failed. Agricultural land has been flooded. People and livestock have perished. In a storm in 1897, for example, 1.5 km of the shingle spit at Orford Ness in Suffolk was washed away; and on 6-7 January 1928 disastrous flooding of London occurred, with fourteen drowned when an embankment near Lambeth Bridge failed.

Before the early twentieth century, few studies were made of North Sea flood events. Then, in 1929, A.T.Doodson of the Liverpool Tidal Institute and J.S.Dines of the Met Office published Met Office *Geophysical Memoir* No.47, in which they investigated the greatly elevated sea levels that had occurred on a number of occasions, but especially in London in January 1928.

Malcolm explained how positive and negative surges occur (respectively raised and lowered sea levels) and then discussed the disastrous storm surge of 31 January and 1 February 1953, the magnitude of which was the greatest on record for the North Sea as a whole. An

outcome of this disaster was the establishment of a British storm-tide forecasting service.

The next speaker was **Julian Mayes** of MeteoGroup UK, whose topic was "The Thames flood of 1928 – causes and impacts". He began with a full review of the meteorological situation, not just at the time of the inundation but also in the preceding week or two. Then, he described the flood events of 6-7 January in various parts of London, particularly Hammersmith, western Chelsea, Battersea Park, Pimlico, Wandsworth and some areas of Greenwich Borough. The fourteen who drowned were mostly in basements and did not stand a chance, as the water advanced very quickly. Clothing aid was supplied to 1500 people and 2500 tons of disinfectant were issued. A relief fund raised £26,400 by 18 January.

Julian showed many contemporary illustrations of affected areas, some from newspapers, and compared them with views of the same places today. The catalyst for redevelopment of the affected areas was, Julian said, the 1928 flood.

The third speaker was **Anna Carlsson-Hyslop**, who has recently completed a PhD at the University of Manchester and is now a Research Associate in Cardiff University. She spoke on her PhD topic, the title of her talk being "Early storm surge science – statistics, funding and the Liverpool Tidal Institute"

Anna traced the history of the Institute, with particular reference to the directors who shaped its development and formulated physical and mathematical methods for predicting tides, namely Joseph Proudman (1888-1975), Arthur Thomas Doodson (1890-1968), Robert Henry Corkan (1906-1952) and Jack Rossiter (1919-1972). Initially, much funding for the Institute came from the shipping industry, one of the aims being to make the use of ports safer. Over the years, however, central government has become more and more involved and helped pay, along with local and regional authorities.

In her talk, Anna reviewed the work of the Institute during and after the Second World War, mentioning that surge forecasting for the German coast was requested in 1941 and that the 1953 surge brought about an increased focus on surge science and also greatly increased funding from central government. A shift to computer modelling occurred in the 1960s; and the context shifted to climate change in the 1980s.

After Anna's talk, there was a short break for refreshments before **Sarah Lavery** of the Environment Agency introduced the technical tour of the Thames Barrier. She first showed a DVD and then talked about the Barrier, stressing that it was part of an integrated tidal defence scheme with other coastal and river defences upstream and downstream. London, we were told, is sinking, through post-glacial subsidence, and also the Thames is now narrower than it was hundreds of years ago, before reclamation schemes have reduced the river's width.

Construction of the present Barrier began in 1974 and river traffic was maintained throughout the construction period. Most components were manufactured in the UK, but that would not be possible nowadays. The Barrier was completed in October 1982, first used in February 1983 and officially "opened" by Her Majesty the Queen in May 1984 (though some of our number questioned the use of the word "opened", but that is what the official plaque says!).

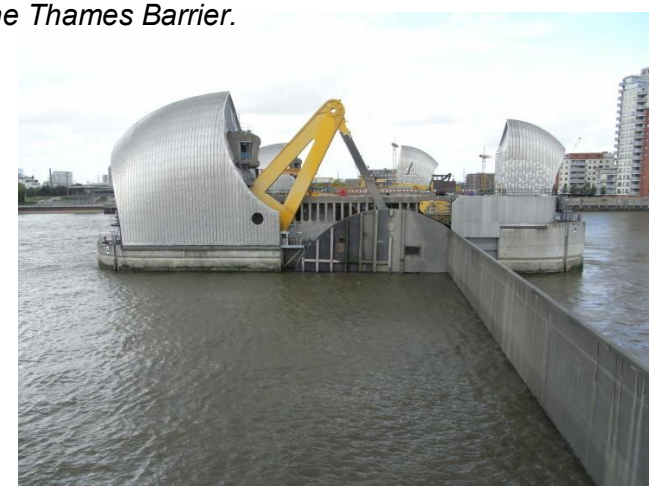
A major design criterion was that the Barrier had to be aesthetically pleasing. Another was that it had to withstand the once in 1000 years event. The Barrier and other coastal defences will have to be upgraded by 2030 to make sure they are structurally sound and also remain capable of protecting against surges after predicted rises in sea level have taken place.

After Sarah's introduction, the group toured the Barrier and Control Room. This tour took us inside the Barrier and under the river bed and allowed us to view at close quarters the mechanisms used to operate the Barrier. The photographs on page 19 give a flavour of the visit.

The visit was supposed to end between 4.30 and 5.00 pm. In fact, it finished around 5.45 pm, such was the interest shown by the group; and Sarah was very, very willing to continue explaining and showing the various aspects of the Barrier. She was a star. The meeting was already a good one after just the talks. By the end of the tour of the Barrier, all were agreed the meeting had been superb. Many, many thanks to Julian Mayes for arranging it.

Overall view of the Thames Barrier.

View northwards across the Barrier.
(Picture courtesy of Richard Griffith)



One of the Barrier's gates (right) in the 'up' (protection) position.

Team photo!
(Courtesy of Richard Griffith)

FORTHCOMING MEETINGS

3 On **Saturday 24 September 2011, at the Farnborough Air Sciences Trust (FAST)**, there will be a meeting on **'The use of aircraft in meteorology: Part I'**. The meeting will begin with coffee at 10:30am and finish around 5.00pm. There will be a tour of the FAST museum, and there will be four talks:

- "Those magnificent weather men in their flying machines", by Malcolm Walker.
- "Wolken Im Luftmeer: the German World War I cloud atlas", by Howard Oliver.
- "Douglas's Law: the aeroplane and the birth of modern meteorology", by Brian Booth.
- "Aerological aircraft ascents: from the first to the most", by Maurice Crewe.

The registration fee will be £10 and the booking form for the meeting has been sent out. If you have not received a form, please contact Malcolm Walker (2 Eastwick Barton, Nomansland, Tiverton, EX16 8PP or MetSocHistoryGroup@gmail.com).

3 The **fourth 'Classic Papers' meeting** will take place at the **University of Reading** on **Wednesday 16 November 2011**. The meeting will explore developments in cloud and precipitation processes, both theoretical and experimental. Details of the meeting will be circulated to History Group members in due course. Meanwhile, the programme at the moment includes the following, and two further talks are yet to be arranged.

Introduction by Malcolm Walker on (a) the cloud chamber work of C.T.R.Wilson and his previous work on Ben Nevis, (b) the fundamental work of John Aitken on condensation nuclei.

Talk by Tom Choularton (University of Manchester) on field investigations of cloud aerosol interactions in ice and mixed phase cloud.

Talk by Paul Connolly (University of Manchester) on laboratory studies of cloud processes and interpretation with models.

Talk by Richard Forbes (ECMWF) on cloud parametrization.

3 On **Saturday 17 March 2012**, there will be a meeting **in London** themed around **'Climate, weather and health'**. Topics to be covered include:
The history of relationships between weather and health, with particular reference to influenza.
The rise and fall of the "health resort"
Studies of weather and cholera in the nineteenth century.
Aspects of weather and health issues in the tropics.
Current Met Office weather and health research.

Further information about this meeting and a booking form will be sent out in due course.

► Provisionally, a meeting on **'The use of aircraft in meteorology: Part II'** will be held at **Farnborough** on Saturday 29 September 2012. This meeting will cover the period from the 1930s through World War II to the 1960s.

SPOTLIGHT ON FITZROY

On 27 June 2011, Malcolm Walker gave the opening address at the Royal Meteorological Society's biennial National Conference, held in Exeter. The theme of the conference was "Celebrating the 150th anniversary of the first weather forecast" and the title of Malcolm's talk was "Per scientiam tempestates praedicere", this being the motto on the Met Office coat of arms, meaning "To predict the weather through knowledge" (see *Marine Observer*, 1992, Vol.62, pp.88-89).

Malcolm focused on Captain, later Admiral, Robert FitzRoy, explaining how the man who was effectively the first Head of the Met Office had come to start issuing storm warnings for shipping on 6 February 1861 and then, on 1 August 1861, against the wishes of his superiors, begun to issue weather forecasts to the general public.

After FitzRoy's death (by his own hand on 30 April 1865), the Galton Inquiry into the work of the Meteorological Department of the Board of Trade (chaired by Francis Galton) virtually destroyed almost everything FitzRoy and his department had accomplished. Storm warnings were not issued from December 1866 to January 1868 and weather forecasts were not issued from 28 May 1866 to 1 April 1879. Galton and others in the Royal Society criticized FitzRoy's methods, arguing that they were not scientific. And yet, with hindsight, we can see that FitzRoy's methods were scientific – in his day – and Malcolm concluded that FitzRoy had indeed endeavoured to forecast the weather through knowledge.

On 13 and 14 July 2011, for a couple of minutes each evening between 6.30 and 7.00 pm, Malcolm appeared on television, in "Spotlight", the BBC One South West local news programme, talking about the 150th anniversary of FitzRoy issuing storm warnings for shipping and publishing weather forecasts for the public.

AN IMPORTANT EARLY PAPER ON ATLANTIC STORMS
by Marjory Roy

I have been going through in detail the Minute Books of the Scottish Meteorological Society (SMS) before they are transferred with other SMS documents to a depository of the National Archives of Scotland (NAS) and discovered this very early analysis of the progress of a major storm across the Atlantic and the British Isles.

The following item was contained in a newspaper report of the Half-Yearly public Meeting of the SMS on 14 January 1863. The report was published in the *Daily Review* newspaper of 15 January 1863. Unlike a number of other papers, which were read at Half-Yearly meetings, it was not subsequently published in a Quarterly Report of the Society or in the Journal of the Society which commenced in 1864, so it is unlikely that it would be known to researchers into the history of meteorology.

The author, Mr Thomas Core, was the lecturer on science at the "Edinburgh Normal School", which was a teacher training college, and he was at that time a member of the Council of the Scottish Meteorological Society.

The Storm of 19th October (1862)

"Mr Thomas H Core read a paper on the barometric depression and accompanying storm of the 19th of October last. The data on which the paper was based were obtained primarily from the returns from the Society's stations, but also from observations made at the Northern Lighthouses, furnished by Mr Thomas Stevenson, from the log-books of various merchant ships, obtained from several ship-owners in Leith, from the files of the *Shipping and Mercantile Gazette* and *Mitchell's Maritime Register*, and from the Board of Trade meteorological reports published in each morning's *Times*. Mr Core began by noticing the fluctuations of the barometer throughout the month of October, which he illustrated by curves for England, Scotland and Ireland separately, pointing out particularly the extensive and remarkable oscillations that took place between the 18th and 24th, and comparing them with the average oscillations of previous years, from which they differed in three respects – 1st, The magnitude and suddenness of the fall, amounting on an average to an inch in twelve hours; 2d, The gradual advance in a north-easterly direction of the depression or trough of the atmospheric wave at the rate of about fifteen miles per hour; and 3d, Its less vertical depth towards the south of Britain. Each of these three points was explained at some length, and illustrated by numerous diagrams. One of these afforded a striking corroboration of the truth of the preceding statements – viz., that exhibiting the state of the barometer on board the barque *Larne*, then off Newfoundland, from the 13th to the 19th. The same atmospheric depression had passed over the Larne on the 16th and had taken three days to reach this country, indicating a velocity of about fifteen miles per hour. The progress of the hurricane, of which the barometer had thus given sure warning, was next noticed and its veering explained. It commenced on the west coast of Ireland about nine o'clock on Sunday morning and by midnight was raging all along the east coast of Britain. Its direction at first was from the SW; by Monday morning it had shifted to W; and on Monday night and Tuesday morning, when it was passing off, its direction was NW. These facts and many others, regarding the time of commencement and direction of the storm experienced by several ships on the German Ocean, Bay of Biscay and North Atlantic, were sought to be explained by the supposition of a "cyclone" or circular whirlwind, traversing the country in a north-easterly direction. Its diameter was computed at from 800 to 1000 miles, its velocity of translation at 15 miles per hour and rotatory velocity at 70 miles per hour."

The Chairman (Sir John Stuart Forbes, Vice-President of the Society) moved a vote of thanks to Mr Core for his communication.

Mr Milne Home (Chairman of the Council of the Society) expressed his sense of the value of the paper, both scientifically and practically. It illustrated very well the manner in which Admiral Fitzroy was able to predict most of the storms with which we were visited. Mr Core had shown that the storm to which he had referred was first felt in the west of Ireland on the Sunday. Now, Admiral Fitzroy received at ten o'clock daily notices of the state of the weather from thirty different places, and if he received notice of a storm on the west coast of Ireland on the Sunday morning, he could predict its arrival in England the same evening or the following day. The telegrams from the Continent also apprised him of storms coming from the eastward."

This paper almost certainly would have inspired Buchan to carry out his subsequent analyses of storms over Europe in 1863 (published 1865), and of depressions crossing the Atlantic in 1859 (published 1868), using charts of surface pressure and wind. Fitzroy did not use surface pressure maps and the earliest production of these was by Le Verrier in France, starting in 1863.

Is anyone aware of an earlier paper showing this type of analysis or was Mr Core the first?

RECENT PUBLICATIONS

This list of books and articles concerned with the history of meteorology and physical oceanography has been compiled by Malcolm Walker and Anita McConnell.

DAVISON, M., 2011. Obituary of Peter Clarke. *Weather*, 66, 199.

FLEMING, J.R., 2010. *Fixing the sky: the checkered history of weather and climate control*. Columbia University Press, New York, 325pp. ISBN 978-0-231-14412-4.

GALLEGO, M.C. *et al*, 2011. The hidden rôle of women in monitoring nineteenth-century African weather. *Bulletin of the American Meteorological Society*, 92, 315-324.

GRANT, A., 2011. Meeting report: Turbulence ï a resolved problem? *Weather*, 66, 111.

HARDAKER, P. and SINGLETON, F., 2011. Obituary of Bob Murgatroyd. *Weather*, 66, 143.

JACKSON, J.H., 2010. *Paris under Water: How the City of Light survived the Great Flood of 1910*. Palgrave Macmillan, 262pp.) ISBN 978-0-230-61706-3.

KENDON, M. and PRIOR, J., 2011. Two remarkable British summers ï óperfectô1911 and ócalamitousô1912. *Weather*, 66, 179-184.

LEONARDO, A.J., MARTINS, D. and FIOLHAIS, C., 2011. The meteorological observations in Coimbra and the Portuguese participation in weather forecasting in Europe. *Earth Sciences History*, 30, 135-162.

SCHULTZ, D.M. and VAUGHAN, G., 2011. Occluded fronts and the occlusion process. *Bulletin of the American Meteorological Society*, 92, 443-466.

This paper compares the 90-yr-old Norwegian cyclone model with recent research results and demonstrates that descriptions of the occlusion process in textbooks need to be rewritten.

AND ALSO …

SPECIAL 65th ANNIVERSARY ISSUE OF *WEATHER*, MAY 2011, Volume 66, No.5. This contains reprints of articles which have been published in *Weather* over the years, as follows:

MANLEY, G. Looking back at last winter (a) February 1947: its place in meteorological history (pp.116-118).
BONACINA, L.C.W., RATCLIFFE, A.H. and MARSHALL, W.A.L. The Lynmouth floods (pp.119-122).
PAXMAN, D.J. The exceptional rainfall of 18 July 1955 (pp.122-124).
STEVENSON, C.M. The dust fall and severe storms of 1 July 1968 (pp.125-127).
BOUCHER, K. The Rumanian flood disaster of May 1970 (pp.130-133).
MANLEY, G. 1684: the coldest winter in the English instrumental record (pp.133-136).
ASHFORD, O.M. The weather and *Weather* (1) (pp.136-137).
ASHFORD, O.M. Sick leave (pp.137-138).
CLARKE, P. The weather and *Weather* (2) (p.138).
BONACINA, L.C.W. London fogs ï then and now (pp.139-140).
PRICHARD, R. They donôt make them like that anymore (p.140).

AND FINALLY …

HISTORISCH-MEERESKUNDLICHES JAHRBUCH (History of Oceanography Yearbook), 2010 (Volume 16). This contains the following papers:

SMED, J. Germanyôs participation in the foundation of ICES, withdrawal during the First World War, and re-entry after the War (pp.7-27).
SMED, J. A note on DôArcy Thompsonôs relation to Germany and German scientists (pp.28-34).
MATTHÄUS, W. Oscar Jacobsen (1840-1889) ï the first German chemical oceanographer (pp.35-76).
MACHOCZECK, D. Operational marine sciences in Germany: Georg Balthasar von Neumayer and his activities at the Deutsche Seewarte (pp.77-96).
HENNINGS, I. Oceanography and German Navy (1939-1945) ï remarks as well as connections and backgrounds of special missions (pp.97-112).
WEICHART, G. The marine chemical research in the German Hydrographic Institute (DHI) Hamburg (1945-1990) (pp.113-130).

SAD NEWS

We are very sorry to report that Vernon Radcliffe MBE, a member of the History Groupôs committee, lost his fight against cancer on 11 June 2011. He was 85. Our most sincere condolences go to Gladys, his widow.

Vernon was a very keen member of the committee, always brimming over with ideas. We shall miss him. With his passing, yet another link with Kew Observatory six decades ago has been lost. He was a voluntary rainfall observer and was appointed MBE in the Queenôs Birthday Honours List of 1997 for services to the Meteorological Office.

2011 MEMBERS

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Alberto Ansaloni (Milano Italy)
Oliver Ashford (Didcot)
Graham Bartlett (Slough)
Rodney Blackall (Buckingham)
Brian Booth (Devizes)
Ron Bristow (Maidstone)
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Joan Self (Exeter)
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Catharine Ward (Bury St Edmunds)
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Christopher Wilson (Cullompton)
Sir Arnold Wolfendale FRS (Durham)
Mick Wood (Bracknell)

THIS IS YOUR NEWSLETTER

Please send comments and contributions to:
Malcolm Walker, 2 Eastwick Barton,
Nomansland, Tiverton, Devon, EX16 8PP.

💻 MetSocHistoryGroup@gmail.com

The Group's annual subscription is £5 (cheques payable to *Royal Meteorological Society History Group*). A reminder will be sent when your subscription is due.

THE NEXT NEWSLETTER

All being well, the next newsletter will be published in November 2011. Please send comments, articles etc to Malcolm Walker (address above) by 31 October.

Malcolm would particularly welcome reminiscences (humorous or otherwise) of life in the Met Office (at home or abroad) in the 1950s, 1960s and 1970s, also recollections of meteorological activities in universities, research institutes or the services (at home or abroad) in those decades.