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This & That
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Forecasting Decision Day

I much enjoyed the film *Pressure* and build up to D-Day landings that was originally set for 5th June 1944 and not a day later. The 6th June gave a very narrow window of opportunity as stormy conditions abated but were set to return. Tensions and dramas were gripping in the build-up and decision itself, with polarised views on the best date.

The film is based on an actual story. The central themes, disagreements and scientific knowledge displayed on the cinema screen are a broadly accurate re-telling of one of the most important weather forecasts in history.

The weather in the English Channel in early June 1944 can best be described as appalling. Had the invasion gone ahead, the outcome could have been catastrophic. High winds and rough seas would have capsized landing craft and low cloud cover would have caused immense problems for pilots and for paratroopers to navigate pre-selected drop zones.

During tense command briefings, meteorologist overall in charge, Group Captain James Stagg, convinced Supreme Allied Commander General Dwight D. Eisenhower that an approaching storm would result in a disastrous invasion if it went ahead on 5th June.

Group Captain Stagg held a Doctor of Science (DSc) degree from Edinburgh University. While his doctorate was in terrestrial magnetism (the study of the Earth's magnetic field), it reflected his deep scientific grounding in atmospheric and planetary physics.

On joining the Met Office in 1924, Stagg was fully aware meteorology was an evolving and highly technical discipline. Many would argue it still is, now with satellites and AI. Maps, charts, reports from landing points and intuition were all they had to go on in 1944.

Stagg's scientific training, combined with his extensive field experience, such as leading a British Polar Expedition to Arctic Canada, made him very well qualified to serve as Chief Meteorological Officer for SHAEF: Supreme Headquarters Allied Expeditionary Force.

Based at Southwick House in Southwick village, about five miles from Portsmouth, Stagg was responsible for coordinating meetings between three dispersed forecasting teams: the Met Office, US Airforce, and Royal Navy. Stagg was responsible for weather briefings to General Eisenhower who had ultimate responsibility on which day to choose.

Relying on Stagg's advice, Eisenhower made the agonising decision to postpone invasion by 24 hours. Stagg had spotted a brief, narrow window where the winds would die down and visibility would improve, just enough to allow for a landing.

If Eisenhower had not taken this gamble for 6th June, unique alignment of tides and a full moon required for the operation would not occur again for another two weeks. The delay would have ruined the element of surprise and risked exposing the massive Allied troop concentrations to German intelligence.

When Eisenhower issued the 24 hours postponement at 05:15 on 4 June, it triggered an enormous and dangerous maritime U-turn. Ships at Scapa Flow (Orkneys), Belfast and River Clyde had already left on 2 June. So had two Royal Navy mini-submarines. Force U convoys were at sea as were minesweeping flotillas and massive battleship, USS Texas.

Turning round the fleet in deteriorating and gale-force weather was a logistical nightmare. Strict radio silence was enforced to ensure absolute secrecy about the invasion plans.

Dwight D. Eisenhower's order early on the morning of 5 June was clear and succinct: "OK, We'll go." Almost the entire fleet of nearly 7,000 vessels left port. Planned H-Hour (target time) was to be from 06:30 on 6th June, with staggered times for each beach.

Interestingly, and relevant to the whole drama of accurate forecasting, the often-gloomy depiction of Stagg in parts of the film is backed up by historical observations. Rear Admiral Sir George Creasy, and chief of staff at the time, famously remarked of Stagg: "Here comes six feet three inches of Stagg and six feet two inches of gloom."

The remark reflects the atmosphere in the run-up to D-Day with Stagg repeatedly bringing unwelcome news to Eisenhower and senior commanders. He was probably seen by many as a prophet of doom.

The film's producers, Working Title and STUDIOCANAL, took great care over all details in bringing the story to life. They visited the Met Office prior to production to collect relevant artefacts and quiz subject-matter experts to help bring realism.

The Met Office Library and Archive Manager Catherine Ross said: "It was great to see the lengths the film crew went to in order to bring the historical reality of the D-Day forecast to the big screen." Ross adds, "Scans of maps, reference books, output from teleprinters at the time - you name it, they wanted to see it."

"Such was the level of detail, even original printing presses were sourced so each document would have the correct opacity and feel. While there's inevitably some creative license to produce a film, what you're seeing on screen is a great re-enactment of some of the tension, disagreements and people behind the most important forecast in the Met Office's history."

One can only imagine tensions at the highest level – and who to believe. The real drama went beyond the film. Weather forecasting under Group Captain James Stagg was not a unified body. It was an extremely tense coalition of three distinct teams that frequently locked horns and clashed over predictions.

The British Meteorological Office was based at Dunstable and led by two civilians, Charles McKinnon Douglas, a legendary World War 1 pilot, and Sverre Petterson, a Norwegian meteorologist. He was a pioneer of what was known as the Bergen School of meteorology.

The team relied on traditional and ultra-rigorous analysis of current weather charts and atmospheric pressure changes. They were deeply cautious about long-range forecasting in the notoriously unpredictable English Channel.

The British Admiralty naval team, based in London, focused heavily on sea swells and coastal conditions. They were typically conservative, knowing full well that rough waters would capsize landing crafts. The US Army Air Forces Team was led by Irving P. Krick, a charismatic American who pioneered "analogue forecasting" at Caltech in Pasadena, California. Krick believed that weather repeated itself in predictable historical cycles.

Based at Bushy Park, Richmond upon Thames, Krick worked with Ben Holtzman using an analogue forecasting method. They were in frequent and direct communication with Stagg about their forecast - and forecasting disagreements between the different teams. These are well documented.

By matching current charts to historical ones, looking for patterns and any correlation, he confidently predicted a period of fine, clear weather for early June.

Not depicted in the film at all was Colonel Donald Yates, an American weather officer and effectively Deputy to Stagg at SHAEF. He and Yates worked closely together to consider assessments and present advice to commanders.

There is reference in the film to a crucial observation from Blacksod Point in County Mayo, Ireland. Maureen Flavin (later Sweeney) was an Irish postmistress – and a volunteer weather observer. Some of her astute observations would prove critical in forecasting for D-Day. Observations at Blacksod Point were of such importance that on 3 June officials called directly to confirm them.

The outcome of the war could have depended on the correct decision being made. At the very least, casualties would have been massively greater had 5th June been chosen and, crucially, until conclusion of hostilities in Europe. Inevitably, there would have been an adverse domino effect if the D-Day landings had got off to a really bad start.

Whilst knowing the decision and outcome, the film was riveting. It puts into context the battery of factors that inform decision-making of which, in many ways, weather was to be the most unpredictable – almost until the day itself.

Stuart

Stuart Sherring

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