British Technology Strangled

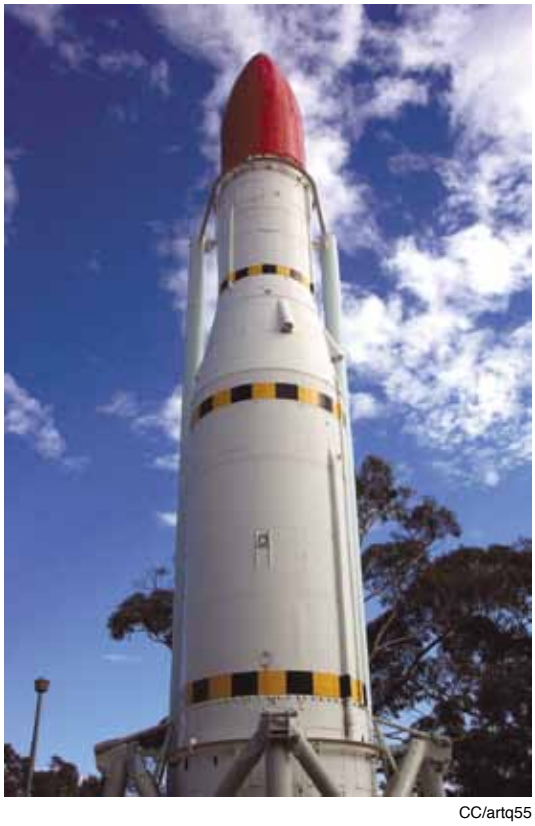
by Mike Robinson

Mike Robinson is the Economics editor for the UK Column*, based in Plymouth, UK.*

PLYMOUTH, UK, Aug. 12—The post Second World War period was a golden opportunity for British engineering and manufacturing. Never in a position to compete with the sheer scale of output of the United States or Germany, Britain was nonetheless in a prime position to capitalize on the momentum of scientific and engineering development that had become necessary during the course of the war.

Yet in the decades that followed, successive governments withheld the funding necessary to fully realize Britain's engineering creativity and in some cases bargained it away, while at the same time, the British media did everything it could to ridicule British engineering efforts. As a result, British manufacturing has been decimated, and Britain turned into the City of London's vision of the post-industrial society.

Let's take a look at a few examples.



CC/artq55

A Black Arrow launch vehicle, similar to the one that launched the UK's first satellite in 1971.

Britain's Space Program

Following the end of the Second World War, along with the United States and the Soviet Union, Britain was a serious contender in the race to develop rocket technology. Weapons delivery was initially the main driver, and for a while Britain's rocket program was the envy of the world.

Described as "perhaps the most economical and powerful space missile of its time," Britain's first iteration was called Black Knight. Between 1958 and 1965, Black Knight had managed 22 launches and reached an altitude of 500 miles.

Black Knight was originally developed to test designs for Britain's intermediate range ballistic missile program, called Blue Streak, which was intended to maintain Britain's independent nuclear deterrent capability. Blue Streak was cancelled before it became operational in its military role, but embarrassed by the wasted money, the British government decided to repurpose Blue Streak, along with parts of the Black Knight program, as a civilian satellite launch system called Black Prince.

Black Prince never actually got off the ground. Britain had already begun looking towards the European continent instead, and rather than funding Black Prince, decided to join the European Launcher Development Organization.

Britain's independent efforts did not end there, however. Another Black Knight derivative was called Black Arrow—a three-stage satellite carrier rocket, designed to be able to accept a fourth, Blue Streak–based stage, for larger payloads.

Black Arrow carried out four test launches between 1969 and 1971. The final launch carried the Prospero X-3 satellite into orbit. This was the first and only successful orbital launch carried out by the UK and took place three months following the sudden cancellation of the project. The only reason the launch took place at all was that the rocket had already been shipped to the launch site.

The launch site itself was scrapped as soon as the

launch was completed, and half of the scientists and engineers involved on the project lost their jobs. As we will see later, this was not the last time such an act of state sabotage would be carried out.

Black Knight, Blue Streak and Black Arrow represented world-beating British engineering. NASA was so threatened by Black Arrow, for example, that they offered Britain free satellite launches. As soon as Britain cancelled Black Arrow, the potential competition removed, NASA withdrew the offer.

Some have offered a compelling argument that the handing over of Britain's rocket technology to the European Launcher Development Organization and the eventual sudden cancellation of Black Arrow was part of negotiations by Britain to join the EEC (the embryonic European Union).

To date, Britain is the only country to have ever successfully developed and then abandoned a satellite launch capability.

CC/Sandman5

A BAC TSR-2 tactical strike/reconnaissance jet.

The Canberra and the TSR-2

Another area where Britain was at the forefront of post-war technological development was aviation. Britain's first jet bomber, the English Electric Canberra, was more capable than any aircraft in its class, setting a world record altitude of over 70,000 feet. It was a commercial success, including 400 built under license in the United States.

However, as the Soviet Union developed its surface-to-air missile capabilities, the Canberra and other high-altitude type aircraft became vulnerable to attack. The Ministry of Supply in Britain decided a new light bomber was needed to replace the Canberra.

The timing of the decision could not have been worse. Wartime aircraft procurement had been a matter of competition between well over a dozen separate companies. As successful as this was while wartime budgets existed, the British government made it clear that the contract for the new light bomber would only be awarded to companies willing to collaborate.

In parallel, political pressure was beginning to build against the very idea of manned aircraft. Duncan Sandys, then Minister of Defense, published a White Paper in which he claimed that the era of ballistic missiles had arrived, and in addition, he argued, a missile program would offer significant cost savings over manned aircraft.

Despite the political infighting between government and military top brass caused by the Sandys White Paper, the go-ahead was given in 1959 to produce a design for a new light bomber which would again be a world-beater.

The new aircraft, named TSR-2 (tactical strike/reconnaissance), was to be capable of takeoff from just 600 yards of runway, of Mach 1.1 at 600 feet, and Mach 2.2 at high altitude. The final design exceeded these requirements, with a theoretical maximum speed of Mach 3 at 45,000 feet.

As design morphed into production, however, it became clear that the original cost estimates were vastly underestimated. Development problems with engines and undercarriage were leapt upon as political footballs, not least by a press determined to undermine British innovation. While test pilots reported outstanding basic flight capabilities, with the aircraft achieving Mach 1.12 at 200 feet, the press reported spiraling costs and technical difficulties, and promoted the U.S. rival, the F-111.

CC/Roger W

A British Airways Concorde. This time, the press had the "Anti-Concorde Project," led by environmental activist Richard Wiggs and backed up by academics from Cambridge University and University College London, feeding it all the propaganda it could want.

In 1965, British Defense Secretary Dennis Healey suddenly cancelled the project. In another act of state sabotage, all machine tooling and jigs were immediately scrapped, as were any airframes in production. Three of these suffered an ignominious end as "damage to aircraft" targets at Shoeburyness shooting range. Two airframes survived and became museum pieces, as did the British aviation industry.

Aeronautical engineer Sir Sydney Camm, designer of the World War II Hawker Hurricane fighter, said of the TSR-2: "All modern aircraft have four dimensions: span, length, height and politics. TSR-2 simply got the first three right."

TSR-2 is remembered as the aircraft shot down by its own government, with the unwavering complicity of the press.

The Concorde

The only major British aeronautical project to survive the cancellations resulting from the TSR-2 fiasco was Concorde, a supersonic passenger jet, capable of flying a regular scheduled service at over 1,300 miles per hour. A joint venture between the newly formed British Aircraft Corporation and France's Aerospatiale, Concorde used a unique wing design, a fly-by-wire control system, thrust-by-wire engine control systems and computer controlled engine intakes—all pioneering technologies.

Development began in the early 1950s. By the end of the decade it became apparent that the French were pursuing a similar program and that they had, in fact, come up with similar design solutions to the main technical problems of supersonic flight. It was decided, therefore, that the project should proceed as a joint Anglo-French effort. A treaty was signed, a name given and development began in earnest.

Once again, though, as construction and testing of the first two prototypes progressed, including its first public outing at the Paris airshow in 1969, the British press stepped in to ensure the project was a failure.

Following the airshow appearance, both aircraft began a world sales and demonstration tour with a view to winning orders from the United States and the Far East, to a barrage of press negativity. This time, the press had the "Anti-Concorde Project," led by environmental activist Richard Wiggs and backed up by academics from Cambridge University and University College London, feeding it all the propaganda it could want.

Just as today, the press simply uncritically regurgitated what they were fed. "Supersonic Bust" and a host of other headlines brought fear of sonic booms, dirty exhausts and noisy take-offs to the gullible public, in the process scuppering any opportunity for export sales as foreign airlines shied away from the bad publicity.

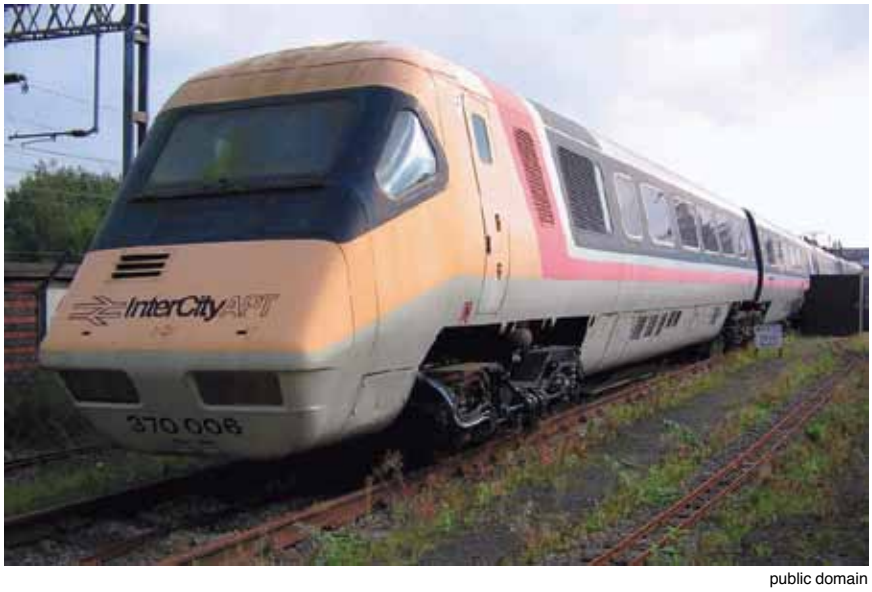
The media never let up with the anti-Concorde publicity. As recently as 2001, when flights had been suspended following its only fatal accident, a headline in the *Independent* newspaper read "Concorde—noisy and dirty, and we can live without it."

"But just because we can do something with the technology we have developed," they wrote, "does not mean that we have to do it all the time. We managed to

fly men to the Moon and back in 1969; yet somehow we have resisted the enormous temptation to have weekly passenger cruises out there. Concorde pollutes the atmosphere and isn't necessary. We haven't missed it. Let's do without it."

We should not have done without it. Concorde represented the cutting edge of British engineering in its industry sector. It was an inspiration to future engineers and loved by the public.

At the end of the day, it was a commercial success for the airlines that bought it, yet negative press coverage guaranteed a "supersonic bust" for the manufacturers; the only airlines to buy it were British Airways and Air France.



public domain

The Advanced Passenger Train. Progress on the development of the Advanced Passenger Train continued to stall, with the broader management and funding issues suffered by British Rail filtering down to the project team.

The Advanced Passenger Train

Britain has led the way in the development of rail transport since the 18th Century. By the middle of the 20th, though, things were changing.

Britain's railways had been nationalized following World War II. Finances became rapidly poorer over the subsequent decade. The so-called Beeching reforms saw the closure of 7,000 miles of railways between 1950 and 1973, significantly higher than the 5,000 miles and 2,363 stations envisaged by Dr Richard Beeching's original report. He would not have objected.

Nonetheless, British Rail continued to innovate. A team of engineers began work in the 1960s to build an Advanced Passenger Train (APT) which would be capable of speeds of at least 125 miles per hour, and would include the ability to "tilt" round corners, allowing faster cornering speeds without the need to lay new track.

The ability to tilt was not the only innovation on the APT. Its braking system used a combination of hydrokinetic braking in concert with traditional braking systems, air conditioning throughout the train, and power-operated doors.

By the end of the 1960s it was becoming apparent that the APT was not progressing quickly enough, mainly because of underfunding, and so effort was diverted into an interim project to get high-speed trains into operation while work on the more advanced APT technologies continued.

The first prototype of what was to become the InterCity 125 was completed in the summer of 1972. During tests in the autumn of that year, it reached speeds of 143.2 miles per hour.

The first-production InterCity went into operation in 1975, and these trains are still running today, with a replacement program only beginning last month.

In the meantime, progress on the development of the Advanced Passenger Train continued to stall, with the broader management and funding issues suffered by British Rail filtering down to the project team.

By 1981 Margaret Thatcher was two years into her first term as Prime Minister, and threatened to cancel the project. British Rail management thought that a sensible response to this problem would be to get the APT prototypes into service. So, to great fanfare, a train packed with journalists began its inaugural round trip between Glasgow and London.

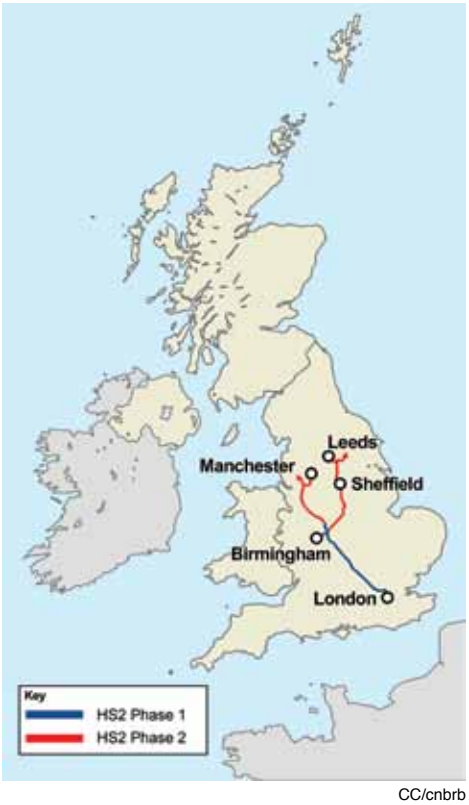
The southbound leg was huge success, setting a speed record of 4 hours 14 minutes to cover the 401 mile journey.

However, on the return trip, the lack of redundancy in some of the systems installed on the prototypes became painfully apparent, resulting in the failure of the

tilting mechanism, "sending food across tables, spilling drinks and jamming the electronic doors." The media immediately begin their campaign to discredit the project, with monikers such as "queasy rider." Rather than celebrating the technical innovation and the speed record, every problem with the prototype, large or small, was given full media treatment. The project never recovered.

Four years later, with no fanfare, the three prototype APTs quietly began operations on the same route once again, this time successfully. However, the InterCity 125 had by this time cornered the market. As with Concorde, media coverage of APT had guaranteed that it could not be sold in export markets. Plans for production trains were abandoned.

One year later, the three APTs was taken out of service and scrapped. The patents for the APT tilting mechanism were sold to FIAT in Italy.



CC/cnbrb

The HS2 route map. The HS2 project has experienced exactly the same type of government sabotage and media coverage as the Advanced Passenger Train, the TSR2, and the Concorde.

The total amount of money spent on APT over its 15-year lifespan was £50 million. The TGV (Très Grande Vitesse) in France cost twenty times as much to get into service.

In 2001, the APT's tilting technology returned to the London-Glasgow route, when Richard Branson's Virgin Trains brought in 57 Italian Pendolino trains which finally beat APT's southbound speed record in 2006, completing the journey from Glasgow to London in 3 hours 55 minutes. APT still holds the outright speed record, having completed a run from London to Glasgow in 3 hours 54 minutes in 1984, which included a five-minute delay because of a signal failure.

The Future

How, then, are things looking for the future? Sadly, the same behavior by the government and mainstream media applies to Britain's latest high-speed rail project, HS2 (High Speed 2), which is planned to link London with the northern English cities of Manchester and Leeds.

With a top design speed of 250 mph, unlikely to be achieved in practice, HS2 is hardly at the cutting edge of railway technology. It's not really a British project, either, with the contracts for engines and rolling stock likely to go to foreign companies. In fact, the Department for Transport's design recommendations used an image of the French AGV (Automotrice Grande Vitesse) train as a suitable example. It will, nonetheless, finally bring British intercity rail up to the standard France has enjoyed since the early 1980s, if it manages to get into operation.

Nonetheless, the HS2 project has experienced exactly the same type of government sabotage and media coverage as the Advanced Passenger Train, TSR2 and Concorde. Headlines such as "The HS2 rail project is out of date and out of control. But it can still be halted"; "HS2 'gravy train' slammed as 1 in 4 staff paid more than £100,000 of taxpayer's cash"; and "HS2: a scheme bound to go off the rails" are just three headlines from one recent media day. The media pressure has been incessant since the project was announced in 2009.

For seventy years, successive British governments of all political persuasions have systematically undermined British industry and innovation. I have highlighted several specific projects in this article, but the same patterns of behavior by government and media can be seen with respect to the British steel, coal, shipbuilding, and car industries.

Throughout its history, Britain has demonstrated that it is able to produce world class innovators and engineers. What positive contribution could they make if British policy would permit them to express their capabilities unhindered?

Contact the author at: mike@ukcolumn.org