[NCMS Lecture: Fred Starr (panopto.eu)](https://cardiff.cloud.panopto.eu/Panopto/Pages/Viewer.aspx?id=6756ae37-a453-4b58-aa22-adc6012cceab)

"Metallurgical Myths and Other Misapprehensions of the Jet Engine

and

Jet Aircraft Era".

Dr Fred Starr : FIMMM, FIE, MIMechE, C.Eng

Repeated statements that the development of the jet engine was held up by the shortcomings of high temperature alloys for turbine blades are without foundation. Frank Whittle, given the funding, could have had a jet engine prototype running by 1932-33. And the RAF could have been equipped with jet fighters by 1939.

It was unfortunate that Griffith (of Griffith Crack Fame) was so opposed to the jet engine principle, probably because he saw this as a rival to his own weird turboprop ideas. Accordingly, funding was withheld, the Germans taking the lead.

Coming to more recent times, the shortcomings of materials helped wreck the prospects for Concorde and the proposed American Supersonic Transport. It is a feature of supersonic flight that better range and payload are obtained by flying as fast as possible. Concorde was designed for Mach 2.2, the American SST Mach 2.7. Flying fast does mean, however, aerodynamic heating, requiring “heat resistant” airframe alloys.

Concorde, in my view, needs to be seen as an engineering failure, because, in part, , of the fall off in strength of aluminium alloys above 120 deg C, meant it was unable to cruise at the original design speed. Similar issues beset the American SST, although it was using titanium.

Recent projected “business jet” supersonic transports dodge the materials issue by flying at around Mach 1.7. They are aerodynamically inefficient, but better engine performance and the ability of millionaire passengers to pay top value fares, might make such aircraft a viable proposition.

F.Starr ; 4th June 2021