

The Meredith principle

I am working on a P51 Mustang. Carving and shaping the oil cooler radiator housing under the wing made me realise how big it is. Surely this must have been a major drag inducer? It turns out not to be due to the Meredith principle, which actually added a modest amount of thrust.

F. W. Meredith at Farnborough saw that the heat energy in the radiator could be added to the air compressed by the radiator grill and thus generate thrust. The hot, pressurised air then exits through the exhaust duct which is shaped to be convergent, i.e. to narrow towards the rear. This accelerates the air backwards and the reaction of this acceleration against the installation provides a small forward thrust. The air expands and decreases temperature as it passes along the duct, before emerging to join the external air flow. In some ways this is similar to a ramjet. He published his ideas in 1936, which were used in the Spitfire, the Hurricane and Mustang.

https://en.wikipedia.org/wiki/Meredith_effect