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Episode Date	Monday	Tuesday	Wednesday	Thursday	Friday
Airborne On ANN	Airborne 12.07.15	Airborne 12.08.15	Airborne 12.09.15	Airborne 12.10.15	Airborne 12.11.15
Airborne Hi-Def On YouTube	Airborne 12.07.15	Airborne 12.08.15	Airborne 12.09.15	Airborne 12.10.15	Airborne 12.11.15
EEA/ANN AirVenture Innovation Preview		AIP-#1 Vimeo	AIP-#2 Vimeo	AIP-Part 1 YouTube	AIP-Part 2 YouTube

Wed, Aug 02, 2006

Was The Red Baron Just Lucky?

Scientists Say Pure Chance Could Account For German Ace's Tally

by Aero-News Senior Correspondent Kevin R.C. "Hognose" O'Brien



The Red Baron, mystery man and tragic figure of the First World War, has inspired novels, multiple biographies, an autobiography, innumerable magazine articles, about 2,890,000 Google hits and a pizza company. Really. He's also loomed large over several feature films, including *The Blue Max* (1966) and the forthcoming *Flyboys*, without himself becoming a central character in them.

But now he's appeared in an entirely new venue: an academic paper. The paper, written by Drs. **Mikhail Simkin** and **Vwani P. Roychowdhury** of UCLA's Electrical Engineering department, is called "Theory of Aces: high score by skill or luck?" The paper advances the controversial idea that Manfred Freiherr von Richthofen wasn't all that special; and that while he was a better than average fighter pilot, luck accounted for most if not all of his success.

The paper has been **released on the internet** but not published.

Simkin and Roychowdhury previously studied a theory that chance played a larger role than merit in the fame of fighter pilots; **that paper** was published in the *Journal of Mathematical Sociology* earlier this year. But while the first paper was mildly controversial with Red Baron fans, the new one is tantamount to dropping an insulting note tied to a spanner, right smack dab into the middle of their aerodrome.

"[T]he probability to achieve by pure chance Manfred von Richthofen's 80 victories is one, divided by the 80th power or 10 to the -21 power. One is tempted to conclude that high-scoring aces had outstanding skills. A more careful analysis proves this conclusion wrong."

It's a bold statement. Simkin (himself a private pilot) and Roychowdhury conclude, in fact, that Richthofen's run of 80 victories might have been pure chance... or to put it in a non-scientific way, dumb luck.



"Let us, given the ratio of the number of defeats to the number of victories, compute the probability to get Richthofen's score. Assuming that the ratio of the probability of credited victory to the probability of defeat is 8.2, the probability of defeat in each decisive engagement is "r" = 1/9.2 or approximately equal to 0.11. The probability of 80 victories in a row is (1-"r") to the 80th power, which resolves to 0.89 to the 80th, or approximately 10 to the -4 power. The probability that at least one of 2890 German fighter pilots will achieve 80 or more victories... is approximately equal to 0.25. Richthofen's score is thus within the reach of chance."

From there, they go on to calculate the distribution of victories, given the "r" of 0.11 that they previously derived, and conclude that, "it is clear that chance can account for most of the variance in the numbers of victories."

Simkin and Roychowdhury still aren't done. They went on to calculate what they called "intrinsic defeat rates." The IDR is the likelihood for individual pilots of defeat or victory... in other words, skill at air combat. It changes over time, both as the pilots who are less skilled are killed, captured, or sidelined by wounds, and as the survivors' skills increase.

The math gets harder to follow here (and a lot harder to represent in HTML or by words) so if you want to see the sheet music, download the **original paper** [Note: .pdf!] We'll skip right to the conclusion (and show the graph):

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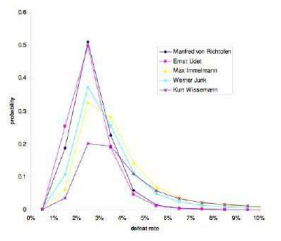
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"The inference for five representative pilots,... is given in [the graph]. In particular, Manfred von Richthofen most likely had the intrinsic defeat rate of 2.5%. According to the distribution of intrinsic defeat rates... about 29% of pilots have [a] defeat rate of 2.5% or lower. This means that MvR is most likely merely in top 29% according to his skill."

While all one's flying instinct cries foul at this, it's hard to argue with the numbers. True, chance is always a factor; many fighter pilots never see an enemy or fire a shot in their careers, even in wartime. The pilots of non-fighter aircraft figure in this study mostly as targets; it is probable that some pilots of higher potential ability were assigned to other kinds of

flying where they had no hope of aerial victories. Able pilots might have been undone by balky engines or jamming guns; pilots of lesser natural ability might have tried to even the odds by, for instance, by carefully measuring and lubricating his ammunition. In the end it's scarcely possible to truly separate the influence of chance and skill. But the authors have been quite daring to try.

Richthofen himself clearly felt that chance was a factor in his life and death. Not long before his demise, he wrote this: "[D]eath may be right on my neck and I often think about it. Higher authority has suggested that I should quit flying before it catches up with me." He resolved not to quit, because he'd be ashamed to take advantage of his fame, when the average German soldier in the trenches had no such way out.



The authors point out that while others have suggested that people perceived as remarkably skillful may merely have been lucky, they are the first ones to tackle this argument with real data, taking both their previous paper and this one together. For this argument to be accepted scientifically, their results have to be repeated.

Anyone have a copy of Mathematica and a good data set on another

group of aces?

FMI: www.richthofen.com



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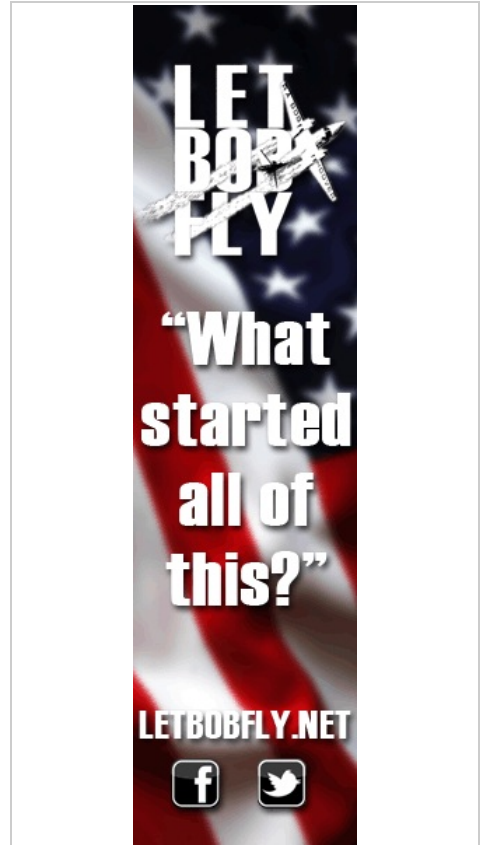
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