

This Thing We Called the Schneider Index

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We frequently hear the Schneider Index referred to at our meetings, in historical reviews, and even by Hollywood in the movie *Dive Bomber*, where it is prominently featured with respect to pilot fatigue. But what really was this index, what did it allegedly measure, and who was Schneider?

Dr. Edward Christian Schneider (1874-1954) (Fig. 1) was an early aviation physiologist who was on staff at the original Army School of Aviation Medicine on Long Island, and was one of the founding fathers of the Aero Medical Association (now AsMA). He was also the third to be honored with the John Jeffries Award by the Institute of the Aeronautical Sciences in 1942, and the first physiologist to receive the award. He had received his Ph.D. from Yale University in 1901 and was head of biology at Colorado College where he also participated in expeditions to Pike's Peak. Dr. Louis Bauer appointed him as the head of physiology at the Army school following World War I.⁴

The Schneider Index was introduced in the May 29, 1920, issue of *The Journal of the American Medical Association*.⁵ The Index was a formula using pulse rates and blood pressures in various positions, both before and after exercise, and was felt to correlate directly to physical fitness. It was also publicized in 1923 in an issue of *Military Surgeon*.⁶ Our own association's *Journal of Aviation Medicine* printed the details of the procedure for obtaining the Index in the March 1935 issue because "[t]here have been numerous requests for the technic of the Schneider index [sic]."¹ Dr. Bauer determined from a "large series of observations" that scores should be assigned as follows: excellent (14-18), very good (11-13), fair (9-10), doubtful (7-8), and unsatisfactory (below 7).² (As the instructions for the test are rather precise, it is a bit too verbose to reprint here; the reader is referred to the first reference listed, available in the journal's archives online.)

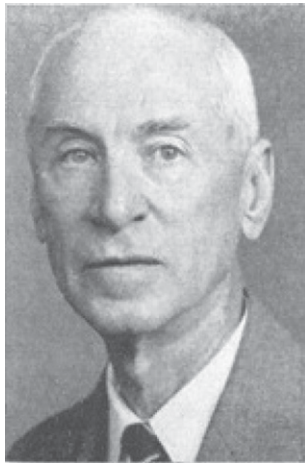


Fig. 1. Dr. Edward C. Schneider (1874-1954).

Soon after its introduction, the Index was adopted by all U.S. military branches and included on every physical examination.⁴ Aviators were grounded based on the Index if it indicated that they were not physically capable of flying. Dr. Herbert Fenwick presented this "highly valuable test" at the Eighth Scientific Meeting in Los Angeles on August 30, 1936. He stated that this foolproof

test, objective and free from influence of the patient and opinions of the examiner, could predict what was then termed "neurocirculatory asthenia or cumulative fatigue," also referred to among pilots as "staleness." It is interesting to note in the commentary following his presentation that the other physicians present unanimously sang the praises of the Index, citing their own experiences in conducting "thousands of Schneiders."³

The Index was further promoted at the military service schools of aviation medicine. U.S. Navy Captain Carl R. Darnall presented a seminar on the subject, relating the Index to various states of health and disease at the Army school at Randolph Field in 1936, and his talk was subsequently published.² Airlines also began using the Index on not only their pilots, but also their stewardesses. As the Schneider Index scores appeared to worsen with age, it was used as an argument in support of age limits for pilots as well – even to the point of arguing that reaching the age of 40 in a pilot is when we should become concerned for safety reasons.³

The legitimacy of the Schneider Index was discredited and use ceased on July 1, 1943, after being in use for over 20 yr.¹ For a method that was unfortunately based on poor science, it is amazing that it was considered the gold standard for over two decades. Interestingly, until very recently many of the physical examination forms used by the military still included a section where the various pulse and blood pressure readings for the Schneider Index could be entered.

REFERENCES

1. A cardiovascular physical fitness test. *J Aviat Med.* 1935; 6(1):30–31.
2. Darnall CR. The Schneider Index in health and in abnormal conditions. *J Aviat Med.* 1937; 8(2):67–74.
3. Fenwick HF. Fatigue – its relation to and the value of the Schneider Index. *J Aviat Med.* 1937; 8(1):30–36.
4. In Memoriam. *J Aviat Med.* 1954; 25(6):567.
5. Schneider ED. A cardiovascular rating as a measure of physical fitness and efficiency. *J Am Med Assoc.* 1920; 74(5):1506–1507.
6. Schneider ED. Further observations on a cardiovascular physical fitness test. *Mil Surg.* 1923; 52:18.

This feature is coordinated and edited by Walter Dalitsch III, M.D., M.P.H. It is not peer-reviewed. The AsMA History and Archives Committee sponsors the Focus as a forum to introduce and discuss a variety of topics involving all aspects of aerospace medicine history. Please send your submissions and comments via email to: walt3@dalitsch.com.

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