Letter to the Editor

Commentary on “The medical aspect of aviation” By H Graem Anderson

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Dear Editor,

I recently encountered a publication on ‘The Medical Aspect of Aviation’ (1), by H Graem Anderson. This forms Chapter XIII of Practical Flying: Complete Course of Flying Instruction by Flight Commander W G McMinnies, RN, published in 1918. I thought it prudent to share some of my reflections on this publication that was written at the end of World War One.

As explained in the introduction to this flying manual, written by Major-General W.S. Brancker and dated 20 March 1918, it was published at a moment of great change in the organisation of British military aviation. Some twelve days later, the flying arms of the Army (Royal Flying Corps) and the Royal Navy (Royal Naval Air Service) would officially merge to form the Royal Air Force. It is for that audience of trainee aircrew that Flight Commander McMinnies RN and H Graem Anderson FRCS wrote their textbook.

In his introduction to the medical chapter, Anderson writes that a “pupil should not conceal any disease” (1) and this advice obviously remains as relevant now as it was then. Anderson first addresses the issue of medical standards for flying training, describing the requirements in terms of aptitude for five reflex actions. Although his advice is far less specific than modern medical standards, the broad principles he expounds remain relevant today. He writes “no person should take up aviation unless he has full normal vision in both eyes” (1). As a principle, this remains the case today: pilots on entry should have an uncorrected visual acuity of at least 6/12 and corrected visual acuity of 6/6 (2, 3). The author shares a similar sentiment about hearing, and today potential Naval aircrew, for example, must demonstrate sum total hearing loss within both the low and high frequencies of 45 dB or less respectively (3, 4). Neurological and musculo-skeletal examination during initial, and then annual, aircrew medicals assess sensory and motor pathways, as well as sense of balance.

Anderson conveys some advice on alcohol, smoking, diet and exercise; tuition on these subjects is still given to aircrew during their initial and periodic aviation medicine training as part of a lecture on aircrew health. The author mentions that “Proper sleep is most important, and 8 hours sound sleep in the 24 hours should be obtained” (1). Advice on sleep is now delivered as part of a lecture about the wider topic of fatigue, covering circadian rhythms and workload, as well as sleep loss.

Anderson emphasises the importance of wearing a restraint harness, helmet and eye protection. His advice on clothing, e.g. gloves and boots lined with lambs’ wool, is aimed at protecting the aviator from the effects of cold, which would have been a significant hazard in an open cockpit when one considers that ambient temperature falls by almost two degrees Celsius for every 1000 feet climbed. Today, aircrew are taught about working in both hot and cold environments as part of a thermal stress lecture.

Anderson emphasises the importance of aviators being dentally fit. The same advice is still given today, but for different reasons. The author seems principally concerned with the increased sensitivity of air rushing over a decayed area of gum or tooth, whereas today we would be more concerned with the incapacitating or distracting nature of pain caused by the expansion of a sealed pocket of gas (generated by tooth or gum disease) upon ascent.

Anderson describes two forms of airsickness, and the first equates to the motion sickness from which some individuals are still prone to suffer in modern aircraft. The symptoms experienced in the second form of airsickness he describes would still be recognised as largely due to hypoxia, with the ear symptoms (difficulty in hearing, earache) being due to the expansion and contraction of air in the middle ear on ascent and descent. He mentions that breathing and pulse rate become quicker at 6000 feet. We now understand that it is at between 8000 and 10,000 feet that the respiration rate increases (5), as a result of stimulation of peripheral chemoreceptors by lowered oxygen tensions in arterial blood (6). As Anderson states, heart rate does increase above altitudes of around 6000-8000 feet (5). It is interesting to note that even in 1918, almost 100 years ago, the figure of 10,000 feet had been established as the altitude above which
supplemental oxygen was required. The big difference is that, whereas in Anderson’s day the oxygen was administered by “inhaling slowly”(1), today the dose is calibrated by means of a regulator.

In summary, although Anderson’s language seems antiquated it is remarkable that, even though he didn’t have the benefit of all the aviation medicine research that has taken place in the interceding 96 years, the themes of his chapter form the basis of lectures that we give to this day.

References

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