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Richard Hobday

Community comment on "Opinion: The Germicidal Effect of Ambient Air (Open Air Factor) Revisited" by R. Anthony Cox et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-375-CC1, 2021

This manuscript provides an authoritative and timely review of the science of the Open Air Factor. I fully support its acceptance in its current form. However, it might be helpful to the reader if the findings were placed within the context of earlier, more practical work, in the field. This, like the OAF itself, has received little attention from the scientific community.

For more than a century, the germicidal properties of fresh air have suffered an unusual fate. It is that of being discovered and adopted during major medical emergencies; only to be abandoned later. During the early months of the First World War, injured soldiers commonly developed virulent wound infections which were difficult to treat. Some had to be nursed outdoors because the smell of their septic and often gangrenous wounds was too foul to be tolerated in hospital wards. [1] Surgeons soon found that leaving infected wounds open, and exposing them to fresh air, greatly improved recovery. [1] So much so, special wards were built for the open-air treatment of infected wounds; and for the general infections that often accompanied them. [2] Later, both air and sunlight were used for wound healing. [3] Elsewhere, in tuberculosis sanatoria, the germicidal effect of open air was valued because it purified the air tuberculous patients breathed. [4] This may explain why, during the 1918 influenza pandemic, seriously ill patients nursed outside in tents are reported to have recovered in greater numbers than those nursed in hospital wards. [5]

During the 1950s, there was a new crisis and renewed interest in open-air therapy. On this occasion it was for the mass treatment of burns in the event of nuclear warfare. [6] In such disaster conditions, adequate numbers of dressings and facilities for their proper use were unlikely to be available. [7] So exposure to the air was considered the only viable treatment for casualties. Control of infection was held to be the `outstanding feature' of the open-air approach. [7] Nevertheless, in the years that followed, the regimen fell into disuse again.

In the 1960s, laboratory experiments proved that open air has a potent germicidal effect. Notably, scientists found OAF exposure reduces both the viability and virulence of the Category IV pathogen, Francisella tularensis. This, in turn, diminished its usefulness as an airborne biological weapon. [8] Some of the species of bacteria tested then now pose a major threat to global public health because of increasing antimicrobial resistance. [9] As
this crisis unfolds a new version of an old remedy for infected wounds has emerged. Referred to as `open-to-air', this takes place indoors with wounds left open and heated with a lamp to promote drying. It is proving effective in the treatment of necrotising soft-tissue infections, otherwise known as gas gangrene. [10]

However, it would appear that here, as elsewhere, much useful knowledge about the disinfecting powers of outdoor air, and its therapeutic properties, is being overlooked. A greater awareness of the science of the OAF might help rectify this. It might also help to secure a permanent place for fresh air both in medical practice and in the control of infections.

References


