

■ Living Books About Life

# The Life of Air

Dwelling, Communicating, Manipulating

Edited by Monika Bakke

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*edited by* **Monika Bakke**

## Introduction: The Multispecies Use of Air

‘It’s alive!’ we could certainly exclaim if confronted with a microscopic view of air. As aerobiologists observe, ‘[h]undreds of thousands of individual microbial cells can exist in a cubic metre of air, representing perhaps hundreds of unique taxa’ (Womack *et al.*, 2010: 3645). But what deserves special attention here is not only that air is full of life but also that, apart from being a mean of transport and communication, air is a habitat in its own right. The *zoe* of air comes in abundance and we – breathing organisms – are all in this together for better and for worse, dead or alive. We have finally come to realize that air is messy, being neither an empty space nor a void, but a space where species meet. And like any other life form, as Donna Haraway emphasizes, we find ourselves ‘in a knot of species coshaping one another in layers of reciprocating complexity all the way down’ (2008: 42).

The natural history of airborne communities enters into the social history of air almost exclusively in moments

of crisis such as pandemics. Airborne microbial life, however, is in constant interaction with human life not only in a pathogenic but also in a beneficial way – directly and indirectly – as it affects the atmospheric processes (Womack *et al.*, 2010: 3645). Anthropocentric perspectives, or rather the social history of air, limit our view of aerial life to human ‘bodies being made to be aerial (Adey, 2010: 25) in aviation to the accelerating saturation of air with the electromagnetic signals in the wireless communication (Dalal, 2009) or focus on the imaginary and artistic ways of dealing with air (Connor, 2010; Bakke, 2006). Unfortunately we tend to forget that as a species we are not the only air users and that air plays an active role in our embodied lives. In fact, we live submerged in a crowded and busy air full of life and full of molecular messages being exchanged by nonhumans. Air developed as the most ancient means of communication, long before the appearance of humans into the earth’s ecosystems, serving as a vast pool jammed with chemical signals which only recently started gaining scientific recognition. Messages expressing desires, warnings and survival instructions are constantly sent via air by plants and animals. Plants, therefore, cannot be considered passive air users, as they are capable of complex signaling, some of which travels into the air and through the air.

The discontent with our ‘forgetting of air’ formulated by Luce Irigaray (1999) with regards to Western philosophy has also, to some degree, been relevant to the life sciences. ‘The air remains the least understood environment from a biogeographic perspective’ (Womack *et al.*, 2010: 3649), even though ‘air is as alive as soil or water’ (3645). Airborne communities have been neglected, their composition not sufficiently

recognized, their ecology poorly understood, and as a result, the diversity of airborne life, its distribution and interactions are still awaiting further research. Hence, aerobiologists call for a better, more unified understanding of the biosphere, inclusive of proper recognition of the biodiversity of the atmosphere. Perhaps, in some way, the preference for solids in philosophy may be paired with the preference for an interest in those life forms which dwell, like us, on the surface of the lithosphere. However, unlike philosophy and science, religion never forgot air. Religion sterilized air because only in this context could air become spirit, soul or *pneuma*. Religious ambitions successfully evacuated air from the realm of life-*zoe*, locating it in the human-God only zone, though recognizing that *bios* – individual life – starts with our first breath and ends with our last. These breaths have been accepted as significant aerial moments in human life, as those determined by God, while the rest go unnoticed. The breaths of nonhumans in this context are meaningless and hence may be terminated by humans without moral consequences.

‘To live – to breathe: to become – to change/alter’ (Irigaray, 1999: 164) can be destabilizing for the anthropocentric subject who is reluctant to let go of ‘ontological hygiene’ (Graham, 2002: 11) and accept that being oneself means being not only human. The composition of the individual breath, although not visible to the naked eye, gives evidence that the human body is a transspecies environment. Our breath reveals a very specific composition of nonhumans living in our nasal passages and oral cavities. With the recent contribution from the Human Microbiome Project launched in December 2007 assuring us about the significance of microbial communities to our bodies, it is

generally accepted that *zoe* – the nonhuman life – constitutes us. Thus *zoe* loses its negative validation and bad reputation, and is postulated as a generative force, a pure vitality of life which, as Rosi Braidotti claims, ‘rules through a trans-species and trans-genic interconnection’ (2006: 111), whereby ‘consciousness attempts to contain it, but actually lives in fear of it. Such a life force is experienced as threatening by a mind that fears the loss of control’ (2004: 110).

Similarly, breathing goes on, as Irigaray puts it, ‘at the tempo of transformation that is too quick for reason, consciousness, and for any means man can master’ (1999: 164). The turbulent rush of air in and out of our body is ecstatic (Irigaray, 1999: 164) as it allows us to participate in something bigger than ourselves – in other turbulent flows. The air flow from breathing in and breathing out is not just a sign of life from a single organism whose breath can be heard, but rather an indication of the coexistence of many lives in various interspecies relationships. Thus, to become oneself, with each breath sustaining life, is actually to become with many – to alter with many – most of which are nonhuman. Hence, the vital necessity of breathing coincides with the most radical openness to the nonhuman realm – it is most ecstatic. Each breath is always a part of some greater exhalation, as much as it contains infinite traces of other breaths and is full of life which sometimes also brings death. Paradoxically, then, in breathing-living we experience not only fear *for* life but often also fear *of* life.

How to breathe well in this turbulent moment when the subject of the humanist tradition is confronted with a radical idea that, in Haraway’s words, ‘we have never been human’? The subject is up in the air, or rather in a

moment of not knowing its own position in respect to nonhuman life forms, as its location is no longer anthropocentrically fixed. Our identities are in the process of becoming and our bodies are constantly merging with the environment. The living matter of air enters and exits our body on a regular basis. Daily survival is a full time job, as breathing is synonymous with living. Our breathing must flow constantly and steadily as both hyperventilation and lack of air severely impede our perceptive abilities and constitute a serious hazard to life. We can neither make up for missed air nor store up air for later. We can hold our breath only for a moment and then, the central respiratory rhythm overrides our will, causing the breath to reach breakpoint. Curiously, so far, there is no sufficient explanation for the breakpoint as the mechanisms of breath-holding are not fully understood (Parkes, 2005: 1). In our struggling with the turbulent flows of aerial existence, we aim for sustainability and balance based on an awareness of its constantly negotiated location within the environment. Here, not roots but routes, processes, passages and flows are important, as life is nonteleological – it certainly is up in the air.

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*The Life of Air* brings together perspectives on the social history of air and the natural history of airborne life. Through an assemblage of text, video and audio this Living Book gives significant consideration to nonhuman users of air and puts forward the proposition that we never breathe alone. The book is divided into five sections addressing various aspects of the use of air discussed in biological, political, philosophical and artistic contexts.

The opening section, 'Living in the Air', brings perspectives from aerobiology, art and cultural studies. It is concerned with uses of air as a habitat in its own right, and as a conduit for the spread of microbial communities via natural atmospheric pathways and the movement of large multicellular organisms, but also as an object of scientific, philosophical and artistic inquiry. Aerobiological research suggests that air is full of life, but its distribution is still poorly understood. Aeolian dust carries microbes between continents, and a dust storm is not dead but full of living organisms which can stay viable for centuries. However, bigger organisms cannot just catch a ride, but need to move with their own means of locomotion; therefore, aerodynamic theory meets endurance physiology in research on the nonstop long-distance migratory flights of birds. Living in air and moving through/with air also belongs to the artistic inquiry into utopian projects for an Air-Port-City floating in the air, as well as for flying gardens. Finally, this section also offers a glimpse into the history of our relation to air as an object of scientific and philosophical inquiry, a habitat and means of communication, and a realm of the imaginary.

Nonhuman volatile communication involving plants and insects, which has only recently become an accepted ecological phenomenon, is the focus of the second section. Air is discussed here as an agent carrying chemical signals of desire and danger or, in other words, chemical cues which are crucial in preventing damage, finding mates, avoiding attack, finding food, etc. This exchange of information serves same species communities as well as a trans-species communication, hence the intricate invisible odor webs imposed on food webs significantly influence a wide variety of plant and animal communities. However, like

all signals, chemical cues sent through the open air are susceptible to subversion, which is a common strategy employed by various organisms. Yet, in specific ecological contexts, insects are capable of distinguishing between honest and deceptive signals from flowers. Since the importance of floral scents is generally overlooked, attention is given in this section to their evolutionary role, for example, in facilitating or suppressing hybridization between taxa. Finally, the airspace surrounding a dancing bee is discussed as another example of the nonhuman use of air. It has been found that the dancing insect releases a unique scent which affects the behavior of other bees in the hive.

‘The Anthropology of Scents’, in turn, is occupied with the significance of odors for humans and in human controlled environments. It is suggested here that the human sense of smell is actually better than previously thought. Despite genetic studies showing a decline in the number of functional olfactory receptor genes in human evolution, there may be some overlooked factors which aid our olfactory abilities. Oenologists, perfumers, and food scientists have proven that our noses are not as bad as we tend to think. Moreover, controversy about the existence of human pheromones is addressed here with the conclusion that, although the actual mechanisms of pheromone perception are not known and no human pheromones have been isolated so far, there is good evidence for pheromonal effects in humans. Among other topics, physiologists, cultural critics, artists and designers discuss the cultural meanings and values of scents, their hierarchies, the uses and abuses of scents, and practices for their selective repression and elimination, which differ from culture to culture.

The fourth section called 'Inspiration-Expiration' takes on the most mundane, and at the same time, most vital phenomenon of breathing, as well as respiratory rhythm and the holding of breath. The texts comprising this section were chosen to show not so much what breathing is, but rather what it indicates about the physical and mental state of the breather, and how it has inspired artists, architects and philosophers. Attention is given to the sound and the chemical composition of breaths. The turbulent sound of air entering and exiting our body during the breathing process is the most obvious sign of life, but it can also provide indications of serious health problems, as can the chemical make up of the air exhaled. Breath analysis is a useful diagnostic method based on the correlation between the occurrence of certain diseases and the concentration of volatile organic compounds. Finally, the simple pleasure of breathing, with its ecstatic and inspirational aspects, is taken up and elaborated on in art works presented in this section and in the philosophical essay closing it.

'Airborne Anxieties' are the topic of the last section of the book. Although it is vital to life, breathing can also work as a destabilizing or even deadly force, as not all inhaled air is safe. Actual and potential airborne agents that pose health risks, such as allergens, chemical pollutants, viruses, and bacteria, are discussed here in the context of science, politics and profit. Moreover this section offers insight into how knowledge about the aerolized delivery of biological or chemical weapons has been publicized and how it is being manipulated by various institutions and governments, and how it is being and linked with terrorism. The variety of voices gathered here is meant to support a critical approach to the institutional management of fear of biological

weapons, and to the militarization of air.

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## Dwelling in Air

Ann M. Womack, Brendan J. M. Bohannan, Jessica L. Green

[Biodiversity and Biogeography of the Atmosphere](#)

Anna A. Gorbushina, Renate Kort, Anette Schulte, David Lazarus, Bernhard Schnetger, Hans-Jürgen Brumsack, William J. Broughton, Jocelyne Favet

[Life in Darwin's Dust: Intercontinental Transport and Survival of Microbes in the Nineteenth Century](#)

Anders Hedenström

[Extreme Endurance Migration: What Is the Limit to Non-Stop Flight?](#)

Elizabeth Thomas

[Tomas Saraceno Looks to the Sky and Sees Possibilities](#)

Nerea Cavillo

[In the Air](#)

Steven Connor – [Taking to the Air](#)

## Nonhuman Volatile Communication

Frederick R. Adler

[Plant Signalling: The Opportunities and Dangers of Chemical Communication](#)

Geraldine A. Wright, Florian P. Schiestl

[The Evolution of Floral Scent: The Influence of Olfactory Learning by Insect Pollinators on the Honest Signalling of Floral Rewards](#)

Michael R. Whitehead, Rod Peakall  
Integrating Floral Scent, Pollination Ecology and  
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Corinna Thom, David C. Gilley, Judith Hooper, Harald E.  
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The Scent of the Waggle Dance

## **Anthropology of Scents**

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Charles J. Wysocki, George Preti  
Facts, Fallacies, Fears, and Frustrations with Human  
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Susana Camara Leret  
Smellscapes: The Loss of Smell in a Visual Culture

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## **Inspiration-Expiration**

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Tomas Saraceno  
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Ruud Kaulingfreks , René Ten Bos  
Learning to Fly: Inspiration and Togetherness

M. J. Parkes  
Breath-holding and Its Breakpoint

## **Airborne Anxieties**

Simon Luechinger  
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Avoidance of Allergens and Air Pollutants in Respiratory  
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Lisa Fong Poh Ng ; The Virus That Changed My World  
How Flu Viruses Attack

What You Should Know About Biological Warfare

How to Survive- Biological or Chemical Attack

Critical Art Ensemble  
Bodies of Fear in a World of Threat

Beatriz da Costa  
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