Yunنان province through its 1894 “migration” out of Hong Kong and its subsequent spread around the world (2). Another could consider the plague in China. Numerous data are available on Y. pestis plagues in China through the centuries (4), and much is known about how the developments and declines of Chinese dynasties were influenced by environmental conditions, including major epidemics.

The World Health Organization considers plague a reemerging disease, and it might accurately be referred to as a neglected one. It is always worth looking back in order to understand the present—and to prepare for what might be coming. Plague and the End of Antiquity and Pestilential Complexities provide an ideal historic basis for dealing with the many facets of plague today and in the future.

References and Notes

4. See, for example, Z. Zhang et al., Integrat. Zool. 2, 144 (2007).

NEUROPHYSIOLOGY

A Sharp Look at Stories of Smell

Stuart Firestein

About half the lectures in olfaction seem to begin with the phrase, “and even humans are able to detect 10,000 odors.” That number is also where Avery Gilbert’s What the Nose Knows, on the sense of smell, begins. But Gilbert digs a little deeper. Why is this such a nice round number? Where did it come from? How come nobody ever gives or takes credit for it? For four pages, Gilbert tracks down the number’s source in an engaging tale of scientific gullibility that should become a textbook example of how spurious facts arise and become entrenched in the literature. The answer, which I won’t give away here, is like one of those jokes in which the yogi who is supposed to tell you the meaning of life turns out to be just some average Joe.

The history of olfactory science is especially curious because smell has always been intertwined with the commercial and aesthetic uses of fragrances and flavors. One could make a case that perfumery, not alchemy, gave rise to the science we now call chemistry, and odor chemistry has always involved some mixing of art and science—not always in clearly demarcated ways. Smell was long considered different from our other senses, idiosyncratic in both its physiology and psychology. Curious theories of olfaction, many based on not much more than anecdote, found their way into the mainstream and remained there much longer than was appropriate.

For a fresh look at the science and marketing of olfaction, Gilbert is well positioned at the interface between olfactory science and the fragrance industry. Although a sensory psychologist who also worked within the industry for many years, he was never really part of either academic research or the corporate culture. He therefore has an outsider’s view that allows him to cast a wry and critical eye everywhere. The book reveals him to be a debunker par excellence. And olfaction, both as a discipline and an industry, has needed some debunking.

After tackling the 10,000-odors myth, Gilbert scrutinizes a series of topics including the weird chemistry underlying perfume mixtures, psychological humdingers about why we can’t name odors (“not enough words,” which even on the surface of it seems ridiculous), and paranoia about attempts by marketers to control consumers using odors to deliver subliminal messages to the amygdala. To each of these topics, he brings some simple sense—often reversing, or at least balancing, years of accepted drivel.

In the chapter “The olfactory imagination,” Gilbert turns literary critic. Whether or not you agree with his very strong opinions on literature, you will have your eyes (or is it your nose?) opened to the ways scent and fragrance permeate literary allusion. Happily, his analysis goes far beyond the clichéd madeleines of Marcel Proust and exhibits the same thorough research and thought found in his analyses of the science and marketing of olfaction.

But it would be wrong to give the impression that this is only a book of contrariness. It offers a great deal of fun as well, and every fallacy that Gilbert debunks he carefully replaces with the facts, which invariably turn out to be more interesting. For example, there are impressively detailed chapters on the variation in olfactory ability among individuals (which helps explain why I don’t smell all those awful things my wife claims to perceive), what makes a smell expert, the critical role of olfaction in foods and flavors, and the psychology of olfactory perception.

The book is also full of late-20th-century cultural references that may not be evocative to anyone who didn’t live through it all but are right on the mark for those who did. A chapter on scent and the movies covers the fascinating, if doomed, history of smell-alignment and its numerous incarnations. In the required chapter on bad smells, aptly summarized as “When bad smells happen to good people,” Gilbert uses an impressive list of malodor metaphors to describe the terrible things that can result from noxious odors. And the author seems never to have heard a fart joke that he didn’t like (me either). The book even has an index entry for “flatus,” directing readers to a detailed two-page account of relevant experiments.

My only regret is that the book could have included more science. The field of olfaction has come of age in the past two decades, even garnering a 2004 Nobel Prize for the discovery of the olfactory receptor gene family (the largest in the mammalian genome). Gilbert doesn’t mention the advances in molecular biology, physiology, and genomics that have marked the field’s recent history. This rush of new discoveries has served to demonstrate how mainstream olfaction really is. Not the idiosyncratic quirky sense of just a few years ago, olfactory perception arises from mechanisms involving protein receptors, second messengers, gene transcription, axon guidance, neural regeneration—the whole shebang of modern neuroscience. And, indeed, this is precisely Gilbert’s overriding thesis throughout the book: olfaction is not an enigma, a waft of incomprehensibility manipulated by a priesthood of perfumers and their strange chemical incantations. The recent developments in the field offer the best evidence for a rigorous scientific approach to all of olfaction.

In spite of all the fun, What the Nose Knows provides a well-researched, even scholarly, compendium of olfactory facts and fallacies, woven into an enticing history of the uses and misuses of scent. Having dug through what one can imagine must have been some very moldy smelling archives, Gilbert presents a wide-ranging yet deep look at what our “noses knowses.”

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