



II. Scientific Prospects from 1.5 Million Responses

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The Monell Chemical Senses Center, located in Philadelphia, is home to more than forty research scientists with PhDs in psychology, biology, chemistry and nutrition, as well as in the various subdisciplines and hybrid disciplines formed from them. This diversity of scientific viewpoints finds itself unified by one overall mission of research. This mission is symbolized at the entrance to our institute by a larger than life, gilded statue of a nose and mouth. Here, in dramatic pictorial terms, is our aim: the scientific study of the senses of smell and taste.

Founded nearly twenty years ago, the Monell Center is now the largest research establishment of its kind. Its growth has occurred amid increasing awareness among scientists and public alike that the sense of smell and the role of odors in our social and physical environment have a major impact on the quality of human life. Perhaps the heroic proportions of the Monell nose are, after all, appropriately scaled to this renewed emphasis on olfactory science and esthetics.

Our collaboration with the National Geographic Society on the Smell Survey is particularly gratifying. As scientists, it is part of our responsibility to inform the public. And as researchers, it is our hope to tap ever greater sources of information about human physiology and behavior. I believe these two goals are beautifully intertwined in this project.

Never before has there been a *participatory* survey of olfaction on this scale. The extent of the response is staggering: 1.5 million surveys returned. The geographic range of representation is unparalleled: it is worldwide. The entire human lifespan is abundantly represented from children through to people in their 90s.

The volume of unofficial responses was also impressive—the survey generated more letters than any other single article in the history of *National Geographic*. Many responses were positive and enthusiastic; for instance, whole families and entire classes of students answered on forms they Xeroxed themselves. We have answered mail from many kids who decided to do term papers and science projects on smell. It would be encouraging to think that we sparked the career of one or two future olfactory scientists or perfumers.

Many readers were pleased to be able to take part in a scientific quest; they often offered advice (e.g., what to scratch the samples with—shouldn't we use a different coin for each sample to avoid cross-contamination?). Many volunteered additional observations: they gave the test to their spouses, to their infant children, and to various species of household pets (cats, dogs, and at least one horse).

Other suggestions were critical: Why had we run the test in allergy season? Why hadn't we included return postage? (A potential domestic postal bill of \$2.3 million is why). Of some interest to perfumers and merchandisers is the dismayed refrain of many readers: now even the *National Geographic* is sending out fragrance samples! These readers are clearly overwhelmed by the volume of scented advertisements that cascade from so many periodicals.

Many wrote and called seeking advice for disorders of their sense of smell. Our files bulge with heart-rending accounts of what life is like with an impaired sense of smell (a middle aged woman recovers from the flu only to discover she



has lost her ability to smell; a young man loses his sense after a head injury in an automobile accident). And then there were the rarer letters, from people who have never known what it is to smell a fine perfume as they have been anosmic since birth. My colleague, Charles Wysocki, and I have referred these people to clinical smell and taste centers across the country.

Why did we ask the questions we did? Consider a few. Age: Does olfactory perception decline with age? How great is the decline, and does it affect all people and all odors equally? Handedness: It may affect odor perception directly (through cerebral lateralization of function), or indirectly (through correlated changes in immune function). Sex: Women have been reported to outperform men on many olfactory tasks. If female, are you pregnant?: Anecdotes suggest that pregnancy is a time of altered smell perception; there are reports of increased sensitivity, as well as parosmia (distortions of smell) during gestation. And so on. A rhyme and reason exist for the choice of each question.

Why ask so many people? To gather a sufficient sample of people with relatively rare combina-

tions of attributes. For instance, we can analyze differences in olfaction between left-handed, male allergy sufferers who who smoke, versus those who do not.

What will happen to the results we are now analyzing? They will be published in a forthcoming issue of the *National Geographic*. We also anticipate publication of more detailed and formal analysis in the professional literature.

What will happen to this enormous and unprecedented database? Following the initial analysis by Dr. Wysocki and myself, the data will be made available by arrangement with the National Geographic Society to interested parties. To take two examples of such data: 1) regional differences in performance could be related to climate, or air quality. 2) The zipcode information can be used to cross reference odor performance to Census Bureau databases on personal income, lifestyle, and consumer habits. We suspect that researchers in both the academic and the private sector will find much of interest.

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