The Benefits of Fragrance

By Dr. Morley Kare, Professor of Physiology, Director of Monell Chemical Senses Center, Philadelphia, Pennsylvania

Summary by Stanley E. Allured, Editor/Publisher, **Perfumer & Flavorist**

The luncheon speaker at the Symposium was Dr. Morley Kare, who provided an educational and most captivating presentation on the subjects of taste and smell.

Dr. Kare described the many myths and misconceptions about what the human body smells like. Many people think the body has odors but actually most of the secretions of the body are odorless. It is not until bacteria change them that they either become attractive or offensive. Bacteria plays a part in how animals communicate with odors. For instance, the guinea pig has a secretory gland that tells other guinea pigs what its social status is. If you remove those secretions with a hypodermic needle without letting the bacteria change them, they do not mean very much to other guinea pigs. In that system, the bacteria are critical for communication between animals.

Another general myth and misconception is that, in comparison to animals, humans are very poorly endowed in ability to perceive odors. Mice can pick out an individual animal from other animals. Recently at Monell some mouse chemical odors were identified and then some graduate students were tested on their ability to

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differentiate between individual mice. They are at least as good as mice in this regard.

Dr. Kare talked about the enormous diversity in this field. Some people taste the bitter component in saccharin and others do not. Some people find phenolthiocarbamide, used experimentally, bitter and others cannot perceive it. (The interesting thing about this is that the ability to perceive it or not is inherited.) Only about half of the people can perceive adrostenone. The percentage that can perceive many other compounds is even smaller. It is interesting to note that identical twins have exactly the same responses to androstenone while fraternal twins respond to it differently.

Another significant effect on our ability to smell are health factors. Dr. Kare reported that if we do not get enough vitamin A, our sense of smell is not right. Other nutrients essential for normal taste and smell are vitamins B6, B12, nickel, zinc, copper and iron.

The taste of the food we eat, according to Dr. Kare, determines how much saliva we produce, how long we chew it and our pattern of swallowing. As soon as we take a bite of food, we begin to breathe a little more deeply, our rate of oxygen goes up in anticipation of metabolizing. As soon as we begin to eat, our stomach slows down and our intestines step up. As soon as we taste something sweet, we have a little release of insulin and then another release of insulin. The taste of the food determines how much enzyme comes out of the pancreas. These are some of the functions of taste.

What happens to the body when we sniff a fragrance? It affects the rate of metabolism and the thyroid. Smells or odors can affect the adrenal gland, the gonads, activity of the muscles in both the stomach and the uterus. It can affect skin resistance, blood pressure, breathing, pupil dilation. But there have been no substantial studies on how fragrances work on the endocrine system or the digestive system. This is an area ripe for exploration.

When scientists work with taste or smell, they are talking about a specific compound coming into contact with a receptor membrane of the olfactory cells or the taste cells. Receptors in the mouth and nose transduce the compound and send a message to the brain for interpretation.

Dr. Kare gave an example of how useful understanding structure/function relationship is going to be. When monosodium glutamate is added to chicken soup it facilitates binding of five prime nucleotides to the membrane—a little chicken tastes like a lot of chicken because a lot of messages are sent back to the brain. This is known as potentiation. Once we know the mechanism, we can put a component of a fragrance with a potentiator so that it will send more messages to the brain. It won't be the amount of the chemical that counts but how active it is at the plasma membrane.

Dr. Kane described the work of a large group at Monell that works in immunogenetics, a system that is parallel to the olfactory system. We respond specifically, not generally, to an odorous chemical as we do to an invading organism. If you had a male mouse and two females, which would the male mouse mate with? The female whose genes are least like his own, every time. He's programmed to do that from the time he's born. Animals and humans are born with a commitment to certain chemicals. There is a scientific basis for the phrase "the chemistry is right."

South American monkeys communicate with odors so they are a good model on which to study the importance of fragrances and smell. In a large colony they will all copulate, but only the dominant female gets pregnant. If you take the dominant female away, the next one gets pregnant. If you leave the daughters with the mother, the daughters will not cycle. Take the mother away, the daughters will immediately cycle. If you leave a young female in an all-female environment as opposed to a mixed environment, it takes her longer to mature. Apparently there is something that affects development and ovulation and it is probably odor.

The chemicals that an individual monkey has are *qualitatively* identical. Monell computer studies have shown that it is a *quantitative* pattern that identifies each monkey. All monkeys know one another by odor quite easily.

Dr. Kare predicts a very exciting era ahead, based on the new methods and new tools for studying smell. Understanding the mechanisms of smell will come in the next decade. He closed with the following words:

"I am delighted to share the excitement and the potential and hopefully the rewards that can be generated in this field. We have a unique privilege. What we do adds to the quality of life. There are not many fields, not many professions, that can have that satisfaction: to see what they are doing having such a positive impact on the community."

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Joy Andrews (left), Andrew Jergens Company, with Linda and Felix Buccellato, Custom Essence Inc.

John Lajkiewicz, Intarome, with Carl D'Andrea, Creations Aromatiques, and Jerry Bertrand, Emery Industries

Sheila Kenyon, Garry Voorhees and Laura Belovs of Ungerer

George Chapoulie, Universal Fragrances, with Erika Baumgartner, H. Kohnstamm and Andre Fromentin, Florasynth

Michael Paulle (left), Synarome, with Bill Hamilton and Al Adamson, Armour-Dial