

## PHEROMONES AND COMMON SCENTS

*Humanae vitae* clarifies the reasonable and common-sense perspective that marital sexual love flourishes only when a couple respects its procreative and unitive meanings, only when husband and wife engage in loving sexual acts that are open to life.<sup>1</sup> The unitive dimension, or “love-advantage,” of non-contracepted intercourse—greater interpersonal communion and sexual fulfillment—is supported by data from a recent pheromone study.

In this study, women whose pheromone communication was not blocked by hormonal contraceptives were better poised to make a genetically sound choice of a life partner and more likely to experience sexual fulfillment with a genetically complementary mate.<sup>2</sup> By logical extension, when pheromone communication is functioning naturally, couples should also experience a correlate “procreative benefit”: both partners should be able to recognize the effects of pheromones and other biological markers of fertility (e.g., absence or presence of cervical mucus) to assist them in planning their family.

### Pheromones

The word “pheromone” is a combination of two Greek words: *pherein* (to carry) and *hormon* (to excite). Pheromones are classified as “ecto-hormones,” “chemical messengers that are emitted into the environment from the body where they can then activate specific physiological or behavioral responses in other individuals of the same species.”<sup>3</sup>

Until recently, it was assumed that when human beings assess a potential life partner, they rely mostly on visual and verbal cues. That assumption has been challenged by the findings of olfactory communication research.<sup>4</sup> When men and women come within close proximity to each other, their sensitivity to the other’s chemical odors plays a key role in their natural choice of a mate and sexual/reproductive behavior.<sup>5</sup>

Experimental evidence shows that human beings use olfactory communication in two ways. First, humans produce pheromones in the apocrine glands located in the axillae (armpit) and pubic regions. The discovery of a high concentration of apocrine glands in the axillae led to the use of the term “axillary organ” to describe the “independent ‘organ’ of human odor production.”<sup>6</sup> Although apocrine glands develop during the embryonic stage of life, they become functional only at puberty. The pheromones that are secreted in the vagina consist of aliphatic acids, whose odor varies throughout the menstrual cycle.

Second, human beings subconsciously detect pheromones by means of the specialized region of the olfactory system called the vomeronasal organ (VNO), or “Jacobson’s organ.” The VNO consists of two small holes on each side of the nasal septum and a group of clear cells that resemble nerve cells lying behind these holes. These cells

are thought to be responsible for the detection of pheromones. Although the VNO is sometimes indecipherable in human beings, studies report that there is a functional VNO “that responds to pheromones (even in picogram amounts) in a sex-specific manner.”<sup>7</sup>

### Recent Studies

Evolution has adapted women to be naturally attracted to the pheromones of men whose genes on the main histocompatibility complex (MHC, or immune system genes) are dissimilar to their own.<sup>8</sup> Since children born of parents with dissimilar MHC genotypes are immune-competent by virtue of their diverse immune-system genes, they are better able to battle pathogens and, as a result, have a health and survival advantage over children born of parents with more similar MHC genotypes.

In a study dubbed the “T-shirt experiment,” each of forty-nine women was asked to rate the odors of six T-shirts, three of which had been worn by men whose MHC genes were dissimilar to the participants’ and three of which had been worn by men whose MHC genes were similar.<sup>9</sup> To test the hypothesis that oral contraceptives suppress the olfactory performance of women, the study enrolled sixteen women who were using hormonal contraceptives. The non-pill-using women participated in the study during the ovulatory phase of their cycle and rated the odors of the T-shirts of the MHC-dissimilar men as more pleasant than those of the MHC-similar men. The ratings of the pill-using women (who were not ovulating) were the reverse of the ratings of the non-pill-using women. The pill-using women rated the odors of the T-shirts of MHC-similar men as more pleasant than those of MHC-dissimilar men. In sum, the non-pill-using women were more attracted to MHC-dissimilar men; the pill-using women were more attracted to MHC-similar men.

In a similar study, pill-using and non-pill-using women were asked to rate the pleasantness of T-shirt odors worn by two different groups of men.<sup>10</sup> Again, non-pill-using women in the ovulatory phase of their cycles rated the T-shirt odors of phenotypically dissimilar men as more pleasant than those of phenotypically similar men. Pill-using women showed no such preferences.

These outcomes led researchers to wonder about the fate of the pill-using women’s relationships when these women stop using hormonal contraception.<sup>11</sup> Would such a woman become dissatisfied with the MHC-similar man to whom she had been attracted while on the pill? Would she now be tempted to “wander” in search of a new, MHC-dissimilar mate? If she conceived a child with the MHC-similar mate, could the health and survival of her child be compromised because of immune incompetence? Research into the effects of hormonal contraception on pheromones suggests positive answers to all these questions.

### The Inseparability Principle

*Humanae vitae* also explains why marital sexual love implodes when couples engage in sexual acts that are closed to life. Pheromone studies of pill-using participants confirm the loss of a “love-advantage” from both men and women. One study shows that women who gravitate



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toward MHC-dissimilar men bond more closely to them, are more psycho-sexually satisfied, and are more faithful than women who mate with MHC-similar men.<sup>12</sup> Men who coupled with MHC-dissimilar women reported that their female partners expressed increased sexual fulfillment and fidelity. Men who coupled with MHC-similar women reported the reverse: their partners experienced less sexual satisfaction and were less likely to be monogamous.

In another T-shirt experiment, men rated the odors of shirts worn by women for three consecutive nights during their follicular, or fertile, phase and found them more pleasant and sexually appealing than the odors of the T-shirts worn by the same women during their luteal, or infertile, phase. From these data, researchers inferred that, because the success of male reproduction depends on coupling with a fertile woman, men could use the sweat odors secreted by women during the ovulatory, or fertile, phase to help in their choosing a life-partner.<sup>13</sup> Furthermore, a man who can monitor his female partner's cyclic odor shifts and detect and respond to her peak pheromones associated with ovulation has an advantage over other men. First, a pheromone-cued husband could protect his fertile wife from unsolicited attention from other men. Second, he could also reciprocate with a correlative "peak" psychophysical affection for his wife and an expressed appreciation of her fertility. In this sense, monitoring cyclic pheromone shifts could realize the critical "love-advantage" predicted by one pheromone researcher: "The existence of detectable, attractive ovulation cues could revolutionize our understanding of day-to-day shifts in close relationship dynamics."<sup>14</sup>

*Humanae vitae* teaches that human acts, including marital sexual intercourse, reflect the person-body unity of the human agent. The marital sexual act, with its personal goals and personal effects, is at once biological and spiritual. The spousal meaning of a couple's vocation to love—the

mystery of their personal communion—is inscribed in their vocation to procreate. Data from the pheromone studies vindicate the Church's wisdom in advancing methods of family planning that promote wholesome families and happy marriages that respect life and love.

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- <sup>1</sup> Paul VI, *Humanae vitae* (July 25, 1968).
- <sup>2</sup> C. Wedekind et al., "MHC-Dependent Mate Preferences in Humans," *Proceedings of Royal Society B* 260.1359 (June 1995): 245–249.
- <sup>3</sup> Karl Grammer, Bernhard Fink, and Nick Neave, "Human Pheromones and Sexual Attraction," *European Journal of Obstetrics and Gynecology and Reproductive Biology* 118.2 (February 1, 2005): 136.
- <sup>4</sup> V. Fortunato et al., "Research on Various Structural and Functional Aspects of Olfactive Perception," *Acta Oto-rhino-laryngologica Belgica* 26.5 (1972): 506–510; and S. Caruso et al., "A Prospective Study Evidencing Rhinomanometric and Olfactometric Outcomes in Women Taking Oral Contraceptives," *Human Reproduction* 16.11 (November 2001): 2288–2294.
- <sup>5</sup> Grammer, Fink, and Neave, "Pheromones and Attraction," 140.
- <sup>6</sup> *Ibid.*, 136.
- <sup>7</sup> *Ibid.*, citing L. Monti-Bloch, C. Jennings-White, and D. L. Berliner, "The Human Vomeronasal System: A Review," *Annals of the New York Academy of Science* 855 (November 30, 1998): 373–389.
- <sup>8</sup> Christine E. Garver-Apgar et al., "Major Histocompatibility Complex Alleles, Sexual Responsivity, and Unfaithfulness in Romantic Couples," *Psychological Science* 17.10 (October 2007): 830–835.
- <sup>9</sup> C. Wedekind et al., "MHC-Dependent Mate Preferences."
- <sup>10</sup> Randy Thornhill and Steven W. Gangestad, "The Scent of Symmetry: A Human Sex Pheromone That Signals Fitness?" *Evolution and Human Behavior* 20.3 (May 1999): 175–201.
- <sup>11</sup> Shirley S. Wang, "The Tricky Chemistry of Attraction," *Wall Street Journal*, May 9, 2011.
- <sup>12</sup> Garver-Apgar, "Romantic Couples," 830.
- <sup>13</sup> Devendra Singh and P. Matthew Bronstad, "Female Body Odour Is a Potential Cue to Ovulation," *Proceedings of Royal Society B* 268.1469 (April 22, 2001): 797–801.
- <sup>14</sup> Martie G. Haselton and Kelly Gildersleeve, "Can Men Detect Ovulation?" *Current Directions in Psychological Science* 20.2 (April 2011).

