

LINDA JEAN SHEPHERD, PH. D.

Lifting the Veil



The Feminine Face of Science

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Indeed, I do not forget that my voice is but one voice, my experience a mere drop in the sea, my knowledge no greater than the visual field in a microscope, my mind's eye a mirror that reflects a corner of the world, and my ideas—a subjective confession. —C. G. JUNG

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PREFACE

I learned early in my life what it meant to be a scientist. Only in the last seven years have I struggled consciously with what it means to be a woman—and a woman in science.

I entered the realm of science during the late 1960s, just as the women's liberation movement was organizing. To me, feminist meant the extremists who burned their bras while guys were burning their draft cards. Whereas burning draft cards seemed an important political statement, burning bras just seemed silly. And I could not understand all that squabbling over Ms.

In my teens I was eager to find out whom I was going to marry so I could align my life and career with his—working at his side and sharing his interests. Since I enjoyed all subjects in school and got mostly A's, my adolescent bravado told me I could do anything. Then I started dating John. He spent evenings, weekends, and summers in his basement laboratory. In his chemistry lab he strove to re-create the primordial conditions on Earth that led to the synthesis of nucleic acids, precursors of life. Amidst a maze of outdated electronics gear, he and his friend Tom planned to attract a flying saucer with their Tesla coil, a sewer pipe wrapped with pink and white wire that generated a huge arc of electricity.

My idea of being feminine meant wearing ribbons and frilly blouses, and pursuing quiet activities like cooking and sewing. Although I became proficient at these activities, they seemed humdrum, insignificant, and devoid of meaning. In fact, nothing women did—mothering, teaching, nursing, being a secretary—seemed valued. Science, on the other hand, sparkled with power.

Along with most of my generation, I grew up embedded in the scientific framework. Without realizing it, my reality was defined

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by science. I believed that if science had not proven something, then it did not exist. I had faith that, given enough time and money, scientists could solve all of our problems and answer all of our questions. After all, scientists had landed a man on the moon.

John and I attended college together, married, and entered graduate school to study biochemistry. It never occurred to me that anything feminine could be relevant to science. Science is, after all, an objective and rational discipline. It is the scientific method, a rigorous way of obtaining knowledge. What possible roles could feeling and nurturing have? How could love have anything to do with science? Either a theory is validated and accepted, or it is disproved by further experiments.

During the seventies, I enjoyed the incongruity of being a woman in science. But my conscious expression of anything feminine was limited to occasionally wearing dresses and stockings, having long hair, making tea and sandwiches for John, and cleaning his glassware. Through lectures and lab work, surrounded by other rational scientists, I became even more inculcated into the scientific worldview. Sometimes things didn't make sense or certain assumptions didn't seem right, but I thought the problem was with me—that I didn't know enough—so I didn't question their validity.

Along with many other professional women of my generation, I saw that power in our culture was aligned with the things that men did—science, business, law, politics. In order to prove myself and succeed in the male realm of science I adopted the rational, analytical, hierarchical approach. I wanted to prove that I could be just as smart and competent as men.

Not until seven years ago did I seriously question what it meant to me to be a woman. John and I had divorced and I had no children, so the traditional roles of wife and mother did not apply to me. Although I made more money as a scientist in a biotechnology company than I had imagined possible, my job felt sterile and did not satisfy me. I felt exhausted. I yearned to do work that had more meaning for me, something that would make a difference.

Then I discovered the richness of the Jungian idea of the “feminine principle” as a fundamental force in our psyches. As conceived by C. G. Jung and amplified by modern Jungians, the Feminine (with a capital *F*, to distinguish the archetypal feminine principle

from the superficial sweetness-and-spice-and-everything-nice notion of feminine) describes the archetypal force of relatedness carried primarily by women in our culture. This is the force that attracts, connects, and holds people together. According to Jung, as people journey toward wholeness, men integrate the feminine side of themselves and women integrate the masculine side of themselves. For most people, this process of integration begins to occur at midlife. For me, it began in my twenties, but at the cost of denying the Feminine. This book is part of my personal journey toward revaluing and reclaiming the Feminine.

In reviewing this book for publication, several editors were intrigued by the idea but asked for a change in language away from the Feminine/Masculine dichotomy to avoid the emotional baggage that people bring to the word *feminine*. One editor suggested that I transcend the polarity with an androgynous term that included both. I agonized over this language issue for several weeks. I observed that other authors have confronted this same issue and resorted to less emotionally charged terms, such as left brain/right brain, or the Chinese concepts of *yin* and *yang*. I finally came to the conclusion that we cannot transcend this polarity until we equally value both parts—otherwise the Feminine will continue to be denied.

The danger of using neutral language for qualities that have been classified as feminine is that they are liable to be appropriated by men rather than accredited to women as their carriers. For example, during the nineteenth century it was claimed that women could not do science because they were not analytical enough. Now that scientists have discovered the value of a more intuitive approach, it is being said that women are too rational and cannot make creative intuitive leaps!¹ Such appropriation leaves women in the same inferior position in a hierarchical power structure. While I am delighted when I see men embracing qualities that have been carried by women for centuries, I am angered when men co-opt them and again exclude women from participation.

If these are the qualities that have been classified as feminine in our culture and have been primarily carried by women, then valuing these qualities should also reflect the value of the carrier. Doing

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so can help us be whole people. Carrying through the implications of equally valuing the Feminine would lead to a radical reframing of our concepts of science, how we see the world, and how we lead our everyday lives. While science has been a masculine endeavor, science in the broader sense of a search for knowledge and truth has no gender. I deeply feel that we can no longer afford to limit our search to such a one-sided approach.

Another puzzling reaction to the book came when one woman editor enthusiastically showed the proposal for this book to the head of the publishing company. He rejected it because he considered it sexist. I think he interpreted my honoring of the Feminine as automatically denigrating men, ignoring my emphatically stated desire to *equally* value the Feminine and Masculine. It seems hard for men who are vested with power to embrace qualities that our culture has viewed as powerless. Defensive, they quickly deny these parts of themselves and retreat to a macho male stance. In addition, many men shy away from exploring the Feminine in themselves because it gets mixed up with fears of homosexuality.

When we are enmeshed in such a hierarchical framework we automatically rank one person, profession, race, or gender over another. In doing so we fail to value the wonder, beauty, and benefits of diversity. While lab work grinds to a halt when the dishwasher gets sick, experiments can continue in the absence of the principal investigator for weeks at a time. A company or project will not succeed unless all aspects are equally well done—yet we continue to rank some people as more important to the endeavor than others.

As long as this hierarchical worldview predominates, being different from the white male professional means being inferior. Either you rank as First or Number One or you are dismissed as unimportant. Because of this, I have found that many women—even feminists—are nervous about identifying with anything feminine, since they have worked so hard to prove their equality with men. As a result they deny the parts of themselves that are different from men and are reluctant to explore any quality that could be labeled inferior, such as feeling or nurturing. Even to contemplate the notion that women may be different from men is threatening. For example, when I mentioned the topic of this book to a feminist

historian of science, she looked away uneasily. I asked her why the word “feminine” made her so nervous, and she replied, “Because of biological determinism.” In other words, if feminine characteristics are biologically determined, women are doomed to be forever inferior in a hierarchical world. On the other hand, a worldview that delights in diversity and sees differences as complementary, equally valuable, and beneficial to the whole, allows differences to be embraced and celebrated. An openness to multiplicity is critical to the reading of this book. For this reason, I ask the reader to experimentally suspend thoughts of automatically ranking one thing or person above another, and consider how a world would look that values the creative possibilities inherent in diversity.

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VEILING THE FEMININE FACE OF SCIENCE

Over the last fifty years, the magnificent achievements of science and technology have culminated in disastrous unforeseen consequences, tearing the very fabric of nature. The physics that landed a man on the moon also produced a world haunted by the threat of nuclear war. The chemistry that developed an incredible diversity of plastics also bequeaths a legacy of waste products that nature cannot reabsorb. The biology that brought forth the green revolution through fertilizers, herbicides, and pesticides threatens to yield a silent spring.

While I feel disappointed and fearful about how we choose to use the power of science, I also feel respect for that power and awe for our intellectual achievements. I care deeply about what happens to both humankind and the other species on this planet. When I read about the latest ecological disaster, I feel pain in the core of my being. I also feel the pain of friends and colleagues trying to survive in uncaring, unrelated institutions of science. I write out of hope that changes in individuals' ways of thinking about priorities, goals, consequences, and the very process of science can transform science into a force for freedom, truth, and creativity for all beings. I believe that the Feminine in each of us—the part of us that sees life in context, the interconnectedness of everything, and the consequences of our actions on future generations—can help heal the wounds of our planet. For these reasons I left experimental science and devoted four years of my life to this book.

Many people are troubled about the impact of technology on the environment. Some hold science responsible for the damage to our planet. Others see science as a tool to be used for good or ill, depending upon the values of the people wielding the tool. In addition, the majority of Americans feel intimidated by science and consequently shy away from participating in it. The number of American students entering science is declining. Many turn away from science not because it is difficult, but because it seems dry, dull, and unrelated to their lives. Each year the gap between scientists and the public widens, as researchers speak an increasingly separate language. New words and acronyms describe smaller and smaller bits of nature: quarks and bosons, exons and introns, HIV and AZT. This process of analysis and logic, reducing nature to its component parts, is characteristic of the masculine approach that has defined science. Until recently, most scientists considered feminine qualities, such as feeling and caring, irrelevant—if not detrimental—to their work. While we need the language to describe all the bits of nature, we also need to bring them into relationship with a broader perspective.

Science touches the lives of everyone on the planet. Electricity, automobiles, radios, computers, plastics, pesticides, gunpowder, and antibiotics are all products of science. Because of its success, many look to science to answer all their questions about the world. There is no doubt the grand adventure of science has provided remarkable knowledge about the universe and produced wondrous tools for the improvement of the human condition. Yet, caught up in the tremendous success of the objective, reductionistic approach, other paths to learning about nature have been neglected or suppressed. Examining the history of Western science reveals the intentional repression of one such approach, that representing the feminine viewpoint, which has been ignored from the outset.

WESTERN NOTIONS OF MASCULINE AND FEMININE

Are men and women really different? There are so many levels to this question that they are easily confused. Although considerable anthropological and sociological research by Margaret Mead and

others indicates that gender is a cultural construct, sociobiologists such as E. O. Wilson have renewed the argument that behavior patterns typical of males and females are biologically determined. Between each side of the nature versus nurture controversy lies a vast gray area and a host of unanswered questions. For example, how tightly are intellectual, emotional, and psychological characteristics tied to gender? Intellectually, many women scientists and mathematicians have been recognized for their accomplishments. Emotionally, many male artists, musicians, and writers have shown that the Y chromosome does not render them incapable of great feeling. And the degree to which masculine and feminine psychological qualities are determined by biology or culture remains a hotly debated topic. Regardless of the origin of the differences, however, most cultures associate particular qualities with one sex or the other.

The writings of Aristotle (384–322 B.C.) reflected the thinking of his time and dominated Western thought for over two thousand years. The greatest collector and organizer of knowledge of the ancient world, Aristotle provided the only systematic survey of knowledge until the Renaissance. How did he view the world? What did he write about women? Did he value the Feminine?

Aristotle's concepts about women were derived from a cosmology based on observation and reason. He believed that order is pervasive and exists in increasingly subtle and complex hierarchies. Since "generation" and "corruption" were not observed in the heavens, he deemed the celestial region to be eternal and immutable. Reason and purpose reached perfection in the divine heavens, the abode of the gods. The Earth, on the other hand, had no such permanence. Earthly generation and corruption were clearly observable: the seasons came and went, animals were born, matured, reproduced, and died.

Aristotle applied the terms *male* and *female* to the cosmos. He spoke of the nature of the Earth as something female and called it "mother," while referring to heaven and the sun as "generator" and "father."¹ He maintained that whatever is superior should be separated as far as possible from what is inferior, thus explaining why the heavens are separate from the lowly Earth. Because the male possessed the superior faculties of reason and deliberation, it

followed that “the relation of male to female is naturally that of the superior to the inferior—of the ruling to the ruled.”² Aristotle considered femaleness “a deformity, though one that occurs in the ordinary course of nature.”³

In the process of reproduction, Aristotle reasoned, the man’s seed provides the active principle and the rational soul, while the woman, who is basically an infertile man with an animal soul, contributes merely the matter on which the active principle works. If all goes well, the sexual union produces a male offspring. If, however, the active principle is defective and does not overcome the resistance of the matter supplied by the female, then a female offspring results.⁴ Aristotle wrote:

Just as the young of mutilated parents are sometimes born mutilated and sometimes not, so also the young born of a female are sometimes female and sometimes male instead. For the female is, as it were, a mutilated male, and the catamenia [menstrual discharge] are semen, only not pure; for there is only one thing they have not in them, the principle of soul.⁵

In recent centuries, the soul has lost value, taken on feminine connotations, and has been projected onto women.⁶

Even today, many men experience femaleness as wholly alien and “other.” As reproductive beings, women embody the natural, the disordered, and the irrational. Women often do not make sense to men; they seem mysterious, an enigma. In addition, a woman may arouse in a man confusing emotions and passions—feelings he may deem inconvenient. Love and hate, joy and sorrow, fear and rage, shame and guilt, influence a person’s behavior in complex, often unpredictable ways, creating disorder and chaos. They interfere with clear, efficient, exact thinking. In order to make their way in the world, historically men have projected many disruptive and undesirable qualities onto their apparent source, women, denying any origin within themselves. In this way, men labeled as feminine those qualities they observed in women, together with those qualities they rejected in themselves and projected onto women. Similarly, “undesirable” characteristics also have been projected onto people of other races, nationalities, ages, and religions.

In Western culture, the successful man is considered to be objective, intelligent, logical, active, rational, independent, forceful, risk-taking, courageous, aggressive, competitive, innovative, and emotionally controlled. These qualities have been highly valued in our culture and are well rewarded financially. If a man is too soft or sensitive, he is labeled effeminate or womanish. He feels insulted if told he “thinks like a woman.”

Western society expects women to be nurturing, receptive, passive, emotional, irrational, intuitive, subjective, compassionate, sensitive, kind, unaggressive, and uncompetitive. The positive value of these qualities has been minimized and dismissed as unimportant. In our materialistic culture, love seems irrelevant to the bottom line. This is evident in the fact that social service jobs, as labors of caring, are typically low-paying.

As in other masculine realms such as business and law, feminine qualities have been devalued and repressed in Western science. To many, the terms “feminine” and “science” are still mutually exclusive—scientists are presumed to be men. Publicly, many women scientists still say, “Oh, we don’t think there is anything special about women in science. Science is science.” They dare not talk about differences between the sexes, and try to convince others that differences do not exist. Many scientists are reluctant to express feminine qualities in their work for fear of losing credibility. A woman zoologist admitted:

I am embarrassed to own up to the political sense I have, that if a certain kind of science is feminine or feminized, then somehow it’s second class. And the upshot of that is that I tend to deny to all and sundry that my science has any taint of the feminine. I do that not only on my own behalf, but on behalf of what I still consider to be a beleaguered community of women scientists. . . . Let’s not call it a special feminine way of looking at science, because I think that denigrates it at the present time.⁷

Unfortunately, we are equally ruled by the stereotypes of “feminine” behavior when we react to them and go to the other extreme of excluding them from our repertoire—thus denying them expression—as when we conform to the stereotypes.

Beliefs about what is masculine or feminine, about how men and