WAYS OF KNOWING: OPEN AND CLOSED SYSTEMS

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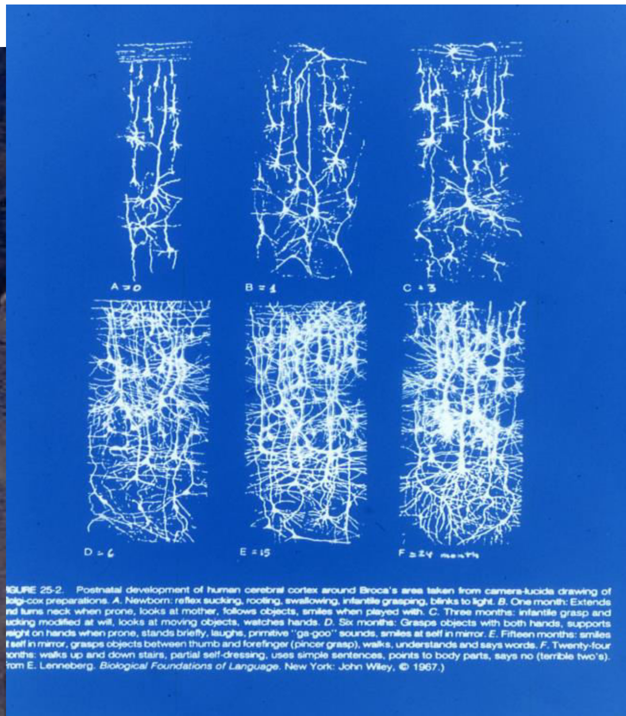
This special issue of *Midwifery Today* focuses on midwifery knowledge. The following articles in it will address the specifics of this body of knowledge. But first, it is important to take a broader look at the differences between open and closed knowledge systems. Why? Because any knowledge system whose adherents wish it to remain responsive to changing events in a rapidly changing world must remain open to absorbing new information and adapting itself to that new information. To achieve an open knowledge system, one must first understand what it means for a knowledge system to be "closed."

How Knowledge Begins

When a baby is gestating in the mother's womb, neural circuits are being formed in its brain. This process begins in early pregnancy and continues as the baby grows, until by the time of birth the baby's developing brain already contains millions of pathways and connections. Much of the information that flows along these circuits is cultural. As it develops, the baby receives enormous amounts of cultural information from the mother's activities—when she goes to sleep, when she wakes, how she moves during the day, her speech patterns, her emotions, etc. So we begin to learn before we are born the most basic patterns of the culture we are born into. From then on, the cultural information most easily processed by the baby after birth is information that conforms to the cultural rhythms to which it is already accustomed. Yet the potential always exists in babies and in children for the easy accommodation of entirely new information. In other words, the brains of babies and children are open systems, readily able to create synaptic connections that generate entirely new neural networks that can process entirely new information. That is why it is so easy for the young to learn new languages, for example: their brain structures are so open to absorbing new information that they have no resistance to it.



A neural pathway at high magnification   The development of neural networks in a baby's brain from birth to age 2

[Note to editor: please delete the writing at the bottom]

Stage One Thinking/Naïve Realism

If a child grows up in one culture and is exposed for the first twenty or so years of its life only to the rhythms, patterns, language, and belief system of that culture, its neural networks will become permanently set in those terms. After that, learning a new language or internalizing the norms and values of a different culture or belief system becomes increasingly difficult over time. Why? Because integrating new information always requires the formation of entirely new neural pathways in the brain. For a child, that process is effortless; for an adult whose neural structures are already set, that process requires enormous amounts of time, energy, and concentrated effort to create new bridges across the synaptic gaps between what they already know and what they desire to learn.

Individuals who are never required to "think beyond" the belief systems of the cultures in which they are raised can over time lose the ability to process new information and can become neuro-cognitively rigid in their thinking. More precisely, humans never really lose that ability, but they can become resistant to it, unwilling to put in the time and energy it would take to develop those new neural pathways. Such individuals are subject to what some brain theorists have called Stage One Thinking.[1] For Stage One thinkers, the world is as their culture defines it. There is only one possible set of interpretations of reality, and that set of interpretations IS reality. In other words, theirs is a closed system. Anthropologists call this way

of thinking “naïve realism”—the notion that “my way is the only way there is.” Most members of small-scale societies, before their massive exposure to Western culture, were naïve realists. In modern societies, all religious fundamentalists are naïve realists—they are completely convinced and certain that their way of knowing is right and is (or should be) “the only way.”

Stage One Thinking: The Rigid Mind

“Everything in its place”

Across cultures and throughout history, ritual has played a critical role in the creation of Stage One thinkers. Rituals enact a society or group’s core values and beliefs. Through rhythmic repetition and the use of powerful core symbols, ritual constantly works to imprint these core beliefs and the behaviors that accompany them in the minds and bodies of its participants.

Stage Two Thinking/Ethnocentrism

Stage Two thinkers are what anthropologist call “ethnocentric.” Ethnocentrists know that other ways of knowing and believing exist, and may be willing to acknowledge that it’s OK for others to think differently. But they are entirely certain that their way is better. At best, ethnocentric Stage Two thinkers feel pity for everyone else who simply doesn’t understand how much better their way is. At worst, ethnocentrists try to wipe out those who don’t believe as they do, considering the existence of other ways of knowing a threat to their own or an

heretical abomination (consider the Crusades, for example). Ethnocentrism, like naïve realism, is a closed system, constantly reinforced by the rituals that enact and sustain that system.

Stage Three Thinking/Cultural Relativism

In dramatic contrast, Stage Three thinkers are entirely open. They come to a realization at some point in their lives that every culture and religion has created their own story about the nature and structure of reality, and who is to say whose story is right? In anthropological terms, Stage Three thinkers are cultural relativists who come to see every story about reality as relative to every other story. Nobody is "right," nobody has a lock on truth, so every knowledge system must be understood in terms of its ecological, historical, and political context, and must be respected as legitimate in its own right. This kind of cultural relativism can sound ideal—it entails respect for, appreciation of, and understanding of every story that every culture or religion tells. Such tolerance! No bigotism, no racism, no ethnocentrism, no judgment.

And yet it is not ideal in a global sense. In some cultures, such as those of rural Pakistan, men are entitled to beat their wives every night. In some cultures, torture of political prisoners is normal. In some cultures, like that of the contemporary US, putting millions of people in prison for relatively harmless crimes is the norm. In Western biomedicine, which has spread all over the world, women are routinely abused and harmed in the name of a science which is not science but biomedical belief and tradition. By what standard can cultural relativists say that such culturally accepted behaviors are not OK?

Stage Four Thinking/Global Humanism

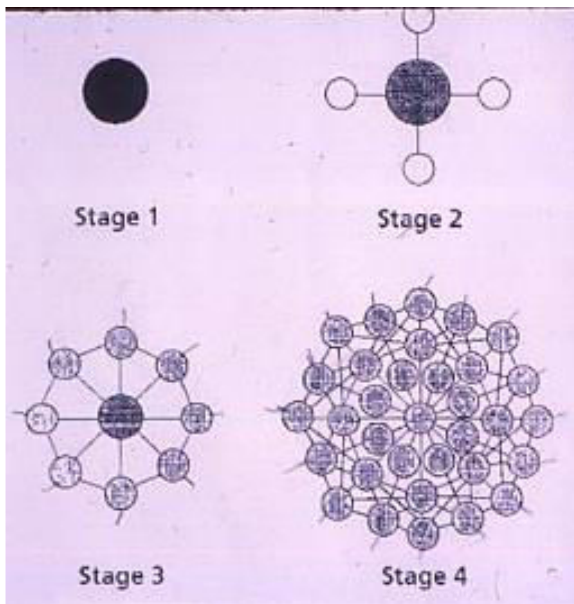
This dilemma posed by cultural relativism has led to an increased global focus on the development of Stage Four thinking, which anthropologists call global humanism. Stage Four/global humanist thinkers recognize the intrinsic integrity and value of every cultural and religious story, yet seek a higher standard that can be applied in every context to ensure the rights of individuals, most particularly the poorer and weaker members of society. No one should be beaten, or raped, or abused. Everyone should have access to clean water and good nutrition and effective health care and good pay for their work. Such things seem desirable goals to global humanists, yet they do not exist in many places. So global humanists seek to think beyond even cultural relativism, seeking universal standards that work for everyone. They want to validate and legitimate every culture while devaluing and discouraging practices that hurt people who do not deserve to be hurt in this higher sense. They are acutely aware that they are on an almost impossible mission, yet one that must be attempted anyway for the good of all. Knowing that totalitarian systems are always harmful, and that no one system can ever really be perfect, they understand that they must keep their knowledge systems open to new information, engaging in bioethical discussion and debate, trying to figure things out without assuming superiority for any one system.

These are MC Escher prints representing the fluidity and unknowability of reality. Stage Four thinkers can relate: they recognize reality's ambiguity and fuzziness, and they know that categories are not solid, things can fade into and out of each other. The world is not black and white but many-colored. Things are not in their places because there is no "place."

Stage Four thinkers do develop and perform rituals, but such rituals are usually very fluid attempts to express and enact larger, more global values. Since the beliefs of Stage Four thinkers are open to flux and change, the rituals they create tend to constantly change as well, or to be spontaneous enactments of something going on in the moment. Think here of the closing rituals at Midwifery Today conferences, which tend to consist of hand-holding and songs that occur to people to sing in celebration of midwives and women. These are very unlike the rigid, pre-set rituals performed in churches, temples, synagogues, etc. that enact very specific and relatively unchanging sets of beliefs.

The Four Stages of Cognition

The following diagram is my attempt to illustrate the differences between these four stages of cognition. The black circle indicates how for Stage One thinkers (naïve realists), there is only one way of perceiving the world. Stage Two thinkers (ethnocentrists) still come out of one way of thinking, are aware of other ways, may find them threatening, amusing, or interesting, yet consider them essentially irrelevant to real knowledge or truth: "our way is best." Both Stage One and Stage Two systems are closed. Stage Three thinkers (cultural relativists) are usually raised in one system, yet give credence and legitimacy to all systems and are open to learning more, as indicated by the little lines extending out from the circles. Stage Four thinkers (global humanists) try to weave a hologram out of all systems that has its own internal cohesion in terms of standards of behavior that work for everyone, yet are always open to new ideas and always willing to rethink the holograms they weave to accommodate new information and to broaden the systems of meaning they weave.



The Four Stages of Cognition

Midwives, Midwifery Knowledge, and the Four Stages of Cognition

Stage One/Naïve Realist Midwifery Systems

Many traditional midwives, and some professional midwives, are Stage One thinkers. They are socialized during their midwifery training to one way of thinking and knowing about birth, have no exposure to other ways, and thus have no incentive to "think beyond" what they are sure they know about birth. Such "naïve realist" midwives can practice within their communities, whether traditional or hospital-based, for their lifetimes, without ever questioning their practices and the beliefs that underlie them. Such midwives still exist, yet are rare in the contemporary world, in which it is becoming increasingly difficult to avoid exposure to other ways of thinking and knowing.

Stage Two/Ethnocentric Midwifery Systems

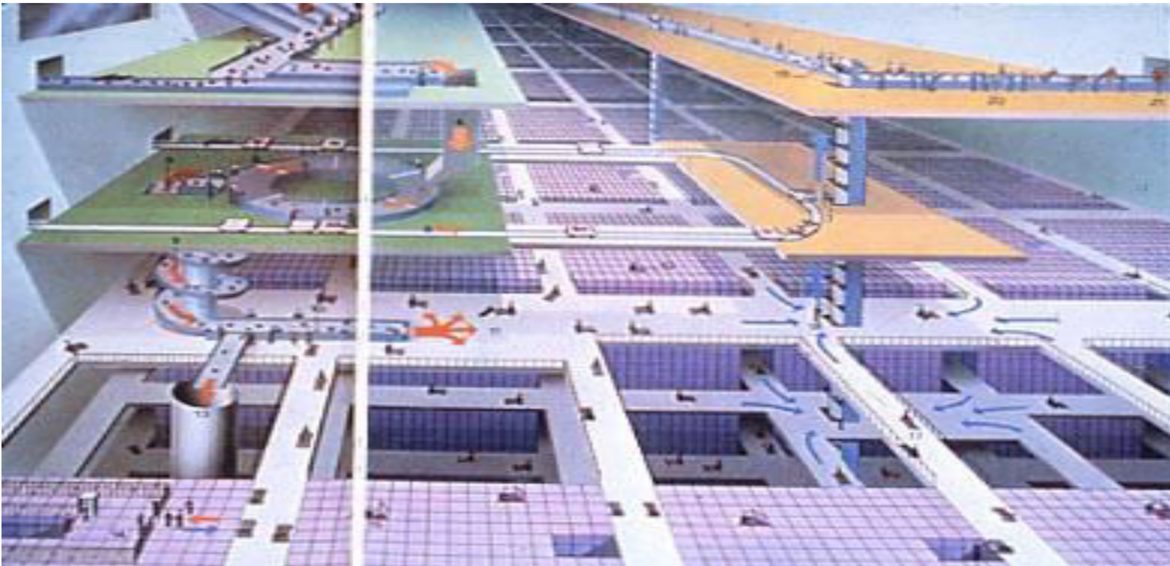
It is far more possible for thousands of contemporary midwives to be ethnocentric rather than naively realistic. Ethnocentric midwifery knowledge and practice systems can be (1) indigenous or (2) biomedical.

(1) Indigenous midwives, if left alone, are most likely to be Stage One thinkers. But most traditional midwives are in some way exposed to biomedicine, which has been massively adopted in developing countries as the most "modern" and progressive system. Unfortunately, this exposure has most often taken the form of TBA training courses, which "train" traditional

midwives in biomedical ways of thinking and practicing. These trainings are highly ethnocentric: the biomedical practitioners who do the teaching are usually not interested in what the midwives know or how they practice, but rather in teaching them “the best way,” which in their minds is the biomedical way.

Biomedicine is itself an extremely ethnocentric and relatively closed Stage Two system. Biomedical practitioners are constantly exposed to new information, yet they tend to incorporate only the kinds of new information that fit within their pre-existing knowledge system. Physicians, for example, are socialized into biomedical ways of thinking, knowing, and believing for at least four years of medical school, three years of residency, and often more if they go on into subspecialties. Their neural pathways are established in terms of what I call the technocratic model of medicine. Confronted with information that does not match what they learned during their training—in other words, information that does not flow easily along their pre-established neural pathways—they are most likely to ignore or discount such information. An obstetrician who reads a study comparing epidurals with other types of pain medication can easily process that kind of information, for example, but the same obstetrician presented with multiple studies that demonstrate the benefits of doulas, being in water, massage, and constant changes in position for pain relief will be likely to discount this kind of information. To process it, he would have to be willing to take the time and energy it would require to develop thousands of brand new synaptic connections and neural pathways along which this new information could flow and become integrated into his cognitive system. Most obstetricians can barely keep up with the information that comes across their desks every day that updates them on the latest drugs and technologies (simply amplifying things they already know). Entrenched in a belief system that relies on drugs and technological interventions to manage birth, they see no reason to exert the much greater amounts of energy it would take to assimilate information from outside their technocratic paradigm. This is also true of thousands of professional midwives around the world, who work hard to learn accepted biomedical ways and then are thrust into busy practices. Overworked, overstressed, and often underpaid, they too are unwilling to open their cognitive systems to processing information that contradicts the biomedical approaches they are taught.

The drawing below metaphorically illustrates the multiple possibilities such ethnocentric/Stage Two practitioners have for dealing with new information: it can flow along their established neural pathways and be assimilated (filed in accessible filing cabinets, for example), or it can be thrown down one of those tubes into oblivion, or it could be filed way in the back, where the synaptic connections stop, in a filing cabinet labeled “information I don’t want to process but might be useful sometime.”



Bodily habituation to closed systems. The diagrams I have offered to illustrate my points are of the mind. Yet the most effective and enduring kinds of learning have to do with our bodies. When you sit in a classroom and listen to lectures, or read books, you are learning didactically—through your mind. When you take a blood pressure or insert an IV or do a pelvic exam the same way a thousand times, you are learning with your body. Body knowing is the hardest kind of learning to change because it involves habituation. Becoming physically habituated to doing things the same way all the time means that your learning process becomes ingrained not only in your brain but also in the cells and muscles of your hands and arms, legs and feet, posture and movement. This kind of knowing is out of mental consciousness and thus cannot be overcome by mental exposure to studies that contradict it.

How do you gain confidence that a woman's labor is under control? You hook her up to the monitor and assume that the information that flows through it is telling you all you need to know. How do you resuscitate a baby in distress? You cut the cord and rush to the table attached to the wall where the equipment you think you need is attached. How do you deal with what you have been taught is prolonged pushing? You cut an episiotomy and perhaps grab the forceps or the vacuum extractor. You don't have to think about it—your body just moves to do it. Birth is not a good catalyst for change in such cases, as most babies come out alive and relatively healthy most of the time anyway. So the more you do it that way, the more it becomes the only way you can imagine doing it.

It is ironic that science, which was supposed to be the foundation of obstetrics, does not support most standard obstetrical practices. Yet science has been used by obstetricians for 150 years to justify the interventions they invented and then increasingly performed. Science used ethnocentrically for Stage Two biomedical thinkers is a blinder for what is really medical tradition, passed down from teacher to student through apprenticeship/experiential learning.

Stage Three/Cultural Relativist Midwifery Systems

I have no data at all to support this assertion, but it seems to me that very few midwives in the contemporary world are true cultural relativists. Midwives deal with life and death, and know that their decisions can result in either one. Stage One midwives make decisions based on the only knowledge they have; Stage Two midwives make decisions based on the knowledge they are sure is best. But of thousands of midwives I have talked with, I can't think of who bases her decisions on no standards at all. Postpartum hemorrhages must be stopped if at all possible. Babies in transverse lie cannot be born unless the midwife does something. Stage One and Stage Two midwives will deal with such complications as their belief systems dictate. But midwives with open minds and systems fluid enough to encompass multiple cultural realities will not be content to approach such complications in whatever way the culture of the woman they are attending would dictate. If they know a way that is scientifically proven to have better efficacy than a traditional way (whether traditional in a biomedical or an indigenous sense), they will apply it. The decisions they make in life-crisis situations are not based on a "whatever the culture says" attitude, but rather on a "whatever works" attitude. And what midwives with open cognitive systems know about what works will constantly change as they are exposed to new information, whether it comes from science, from traditional midwifery, or from a workshop they just attended the day before.

Stage Four/Gobal Humanist Midwifery Systems

In today's rapidly changing and highly fluid world, to be truly effective, midwives must remain constantly open to the new information that is constantly emerging from science and from the increasingly availability of midwifery knowledge from multiple systems—allopathic, indigenous, traditional, biomedical, alternative or complementary, etc. Sometimes the best option for a birth complication might be a homeopathic remedy, sometimes it might be a position used by traditional midwives, sometimes it might be a cesarean section. The Stage Four midwife will keep her system open to new learning from many sources. And she will seek the highest moral and ethical standards, which involve giving compassionate, woman-centered care responsive to the needs of the individual regardless of what the system dictates.

Why Many Midwives Do Not Give Stage Four, Globally Humanistic Care

Cognitive openness and humanistic standards are not easy to maintain, especially in a busy and stressful practice. Even those Stage Four midwives who want to remain open to new

learning and new ways of thinking find that the more stress they are under, the less able and willing they are to process new information. Often they simply don't have the energy or the time. Persistent stress can reduce even highly fluid, Stage Four thinkers to Stage Two or Stage One levels by causing cognitive overload and the development of "tunnel vision"--the need to shut out most stimuli and focus on one thing only. In other words, stress can make fluid thinkers become rigid, if only for a while. How often have you thought, on an especially stressful day, "just don't tell me one more thing"? Usually rest will restore Stage Four thinkers to their normal fluid state. But if the stress continues for too long or becomes too intense, anyone can disintegrate into Substage--a condition of hysteria, panic, or even full-fledged nervous breakdown (also known as "losing it").

Performing rituals can stabilize individuals under stress at Stage One, thereby preventing them from degenerating into Substage. (When the airplane falters, you start to pray. When the crops fail, you make offerings to the gods. When labor slows, you administer pitocin and hook up the monitor.) Stage One rituals can generate a sense that everything is under control (even if it isn't). Practitioners facing what they see as constant potential crises in childbirth use such Stage One rituals preventatively, so that things always feel or seem to be under control.

Let's take a quick look at what women studied by anthropologists all over the world have said about professional midwives working under high levels of stress in Third World countries:

- "They shave you."
- "They cut you."
- "They leave you alone."
- "They don't let your family members in to be with you."
- "They yell at you and sometimes, they slap you."

Perhaps most midwives who practice in these ways at first approached midwifery with high ideals of serving women, just as most obstetricians do. But if you are practicing in a rural clinic in Papua New Guinea or a huge hospital in India, where supplies are limited or non-existent, there are more women than you can possibly care for, there is often no running water and little or no food available for the women, you are treated as inferior by physicians and nastily by nurses who resent your authority, and you are paid so little you can barely support your family, it is most likely that your ideals will fade away in face of unbearable realities. You will shut down cognitively and focus on finding any bits of pleasure or relaxation you can—in other words, you will take every opportunity to drink coffee with your colleagues and ignore the women screaming for your help in the next room. Such are the effects of stress, overwork, underpay, and professional devaluation. Many anthropologists have noted that midwives new to work in such places are often initially horrified by the behavior of their elders and work

harder to support and care for the women, yet a few months or years later, will be behaving exactly like the colleagues they initially abhorred.[2]

What about midwives in the developed world, where technology, supplies, clean water, and food, are readily available, the pay is reasonable, and schedules offer time off to be with one's family? Indeed, it is this kind of midwife who is most likely to care about moving beyond rigid knowledge systems to create a more open, fluid, and individually responsive style of midwifery care. And yet even First World professional midwives are likely to succumb to the pressures of biomedical socialization and habituation to certain routines, to practice defensively to avoid accusations of malpractice, to conform to institutional systems rather than take the time and energy to fight them.

For one example, in the UK 70,000 professional midwives attend 70% of births. To American professional midwives, this situation seems ideal. Yet the Stage Four midwifery thinkers in the UK note sadly that most of those 70,000 midwives have become the source of, not the solution to, the problem. Habituated to hospital birth and biomedical routines, most British midwives have fought rather than welcomed the British government's mandate for more home births. Mavis Kirkham and others have documented how such midwives move among their patients giving vague information, refusing to answer specific questions, offering little or no one-on-one support, and dealing with patient requests by answering "Sister wouldn't like it"—"Sister" meaning the starched and unbending head midwife who runs her clinic more like a business than a support service.

How Midwives Can Foster Stage Four Thinking for Themselves and Other Midwives

(1) Attendance at midwifery conferences. When a midwife goes away to a conference, she is free from the daily pressures of her practice to take in new information. She is exposed to ways of thinking, knowing, and practicing that may not match her own. The midwives in the developed world who tend to become rigid in their practices rarely attend such conferences; they are the ones who most need to attend.

Over the past twelve years, I have attended hundreds of midwifery conferences, and have watched how midwives "get their juice" through being there. Midwifery Today conferences are particularly salient in developing and maintaining Stage Four thinking, as their organizer, Jan Tritten, makes every effort to include all types of midwives—professional, traditional, nurse-, direct-entry—on her programs so that every Midwifery Today conference provides opportunities for midwives to be exposed to the ways other midwives think and know. MANA and ACNM also provide many such opportunities—their conferences include workshops that range from the highly technical to the highly holistic. Particularly exciting are conferences held in countries where midwives are beginning to move outside their normative practices, such as the home birth conferences recently held in Spain. ICM conventions bring together professional midwives from all over the world, and every time slot on the program offers at least a dozen sessions appealing to every possible midwifery knowledge, skill, special interest, or cultural approach. Small-scale regional midwifery conferences allow midwives living

in relatively close proximity to share common interests and expand their knowledge bases about their own history and political situations.

Every midwifery conference I have ever attended has offered its participants many ways to "think beyond" established paradigms and practices; thus I encourage every practicing and student midwife to attend as many such conferences as she practically can.

(2) Learning from women. Midwives who practice the same way for many years are usually midwives who have stopped listening to mothers. Every woman a midwife attends can bring something new to her knowledge and practice. I have interviewed hundreds of midwives about their education and practice, and have often been struck by the changes in practice that can result from listening carefully to and learning from just one woman, who perhaps is unusual but who can teach the midwife herself something new about how best to provide woman-centered care.

(3) Learning from midwives. Midwives have lots of stories to tell, and they tend to be excellent story-tellers. When midwives get together and tell stories, they are not just engaging in chit-chat, but are sharing important aspects of what they learn and how they learn it, of what they know and how they use that knowledge, whether it is didactically obtained or intuited in the moment. When obstetricians get together and discuss birth, the stories they tell are usually stories of pathologies that they find intrinsically interesting because of the puzzles they present, or crises in which they saved or failed to save a life. In dramatic contrast, midwives tend to prefer to tell stories of normal birth, or of how they helped a birth that could have become pathological stay normal (a process I call "normalizing uniqueness"). So much midwifery lore and knowledge is encoded in these stories: listen to them, record them, write books and articles full of them so that others can learn what your stories have to teach!

[Note to editor: This paragraph could be cut if necessary] It is fascinating to me that the earliest midwives to write down midwifery knowledge, like Sarah Stone in Britain in 1737, were not able or did not think to abstract what they knew into categories like "how to handle a post-partum hemorrhage." Rather, they told the stories of the births they attended. The first British midwife to write abstractly about midwifery knowledge, Elizabeth Nihell in 1760, had been taught and heavily influenced by William Smellie, one of the early male midwives.[3] That is one reason why Ina May Gaskin's Spiritual Midwifery has been so important and influential for so many midwives around the world: she told stories, and in the telling one can see how her knowledge developed through her individual experiences with the women she attended.[4] Her second book, Ina May's Guide to Natural Childbirth, offers many stories written by the couples she attended.[5] Into these stories, Ina May interjects in her own words the points at which she had a flash of intuition or a "hunch" that such-and-such might be a good thing to do, and tried it out. The stories allow us to witness her learning process in action and observe how her Stage Four thinking abilities kept her open to learning directly from women and from her own intuition, experientially, in the moment.

(4) Attention to the scientific evidence. The body of scientific evidence supporting many traditional and professional midwifery practices is ever-growing. Every midwife should keep up with it, as so much of it reinforces what has become internationally known as "the midwifery

model of care." Real science is differs fundamentally from biomedical tradition. Every Stage Four midwife should have science at her command, all references ready to counteract every biomedical objection to the kind of care she wishes to give.

(5) Attention to other healing philosophies and modalities. Naturopathy, chiropractic, homeopathy, Reiki, breath therapy, massage therapy, pre- and perinatal psychology, Ayurveda, Chinese medicine, and many other types of "complementary" health care, as well as many indigenous knowledge systems, have much to offer the contemporary professional midwife. It is not possible for every midwife to know all of these systems, but it is possible to be open to what they can offer by learning about them, incorporating one or some of them, and finding practitioners to whom clients can be referred.

Conclusion

Around the world, midwives are under siege as the power and influence of biomedicine grows. Traditional midwives are in danger of extinction and professional midwives are too often ethnocentric servants to biomedical ways of knowing and practicing. Yet in every country, there are dozens and sometimes thousands of midwives, both traditional and professional, who are Stage Four global humanists striving to think beyond established paradigms and practices. Such midwives are constantly working to combine the best of indigenous, allopathic, and alternative knowledge systems to create fluid and open midwifery knowledge systems responsive to women's needs and desires, to ideas and information from other midwives and health care workers, to scientific evidence, and to "whatever works" from wherever it can be learned. If you are a midwife practicing in the 21st century, you have two brand new advantages that your historical counterparts did not have: (1) access to information from a rich variety of sources; and (2) strength in local, national, and international organization. I ask you to utilize these strengths, acknowledge your limitations (remember that stress can take you "down" both physically and cognitively), and strive to keep your knowledge systems open to the learning that this new world can multiply provide.

Endnotes

1. The "four stages of cognition" schema I present here can be found in Schroder, H. M., M. Driver, and S. Streufert, Human Information Processing (New York: Holt, Rinehart, and Winston), 1967. The combination of this theory with the anthropological concepts of naïve realism, ethnocentrism, cultural relativism, and global humanism is entirely my own. Further discussion of this combination can be found in Davis-Floyd, Robbie and Gloria St. John, From Doctor to Healer: The Transformative Journey, New Brunswick NJ: Rutgers University Press, 1998 and Davis-Floyd, Robbie and Charles Laughlin, The Anatomy of Ritual (New York: Random House/Schocken), n.d. (forthcoming).

2. The anthropological studies I draw on are too many to be listed here. Partial references can be found in Davis-Floyd, Robbie, "Mutual Accommodation or Biomedical Hegemony," Midwifery Today, March 2000, pp 12-17, 68-

89. Full references to and descriptions of many of these works can be found in Davis-Floyd, Robbie, Sheila Cosminsky, and Stacy Leigh Pigg, "Introduction" to Daughters of Time: The Shifting Identities of Contemporary Midwives" (a special triple issue of Medical Anthropology 20:2-3/4, 2001). This Introduction is also available at www.davis-floyd.com

3. Stone, Sarah, A Complete Practice of Midwifery, Consisting of Upwards of Forty Cases or Observations in That Valuable Art, London: printed for T. Cooper, 1737; Nihell, Elizabeth, A Treatise on the Art of Midwifery. Setting Forth Various Abuses therein, especially as to the Practice with Instruments: The Whole Serving to put all Rational Inquiries in a fair Way of very safely forming their own Judgement upon the Question; Which it is best to employ, In Cases of Pregnancy and Lying-In, a Man-Midwive, or, a Midwife, London: A. Morley, 1760. Stone and Nihell's works are described and compared by Herrle-Fanning in Body Talk: Rhetoric, Technology, Reproduction, edited by Mary M. Lay, Laura J. Gurak, Clare Gravon, and Cynthia Myntti. Madison: University of Wisconsin Press, 2000.

4. Gaskin, Ina May, Spiritual Midwifery. Summertown, Tennessee: The Book Publishing Company, 1977.

5. Gaskin, Ina May, Ina May's Guide to Childbirth. New York: Bantam, 2003.