The Practice Turn in Nursing Epistemology

Pamela G. Reed, RN; PhD; FAAN
Professor, University of Arizona, College of Nursing, Tucson, Arizona

This column presents the perspectives of two authors, Pamela Reed and Gary Rolfe, on the topic of knowledge production in nursing practice. The articles were written independent of each other, but readers may note areas of remarkable similarity as well as differences in emphasis between the two authors. The column concludes with a dialogue between Pamela Reed and Gary Rolfe.

Nursing is a fascinating discipline. Nurses have the honor and expertise to participate closely in human healing processes of individuals, families, communities, and other systems of care. Yet, because the practitioner's expertise in healing is not fully understood, some account for it by relying on concepts (like intuition, tacit knowing, and gut feelings) that render nursing knowledge more mystical than professional. Admittedly, there are elements of mystery in nurses' patterns of knowing. However, contrary to philosophers of science Reichenbach and Popper, the *context of discovery* is not primarily mystical territory (Lamb & Easton, 1984), and this author believes it both possible and beneficial to obtain better explanations of how nursing knowledge is produced in the practice setting. Furthermore, trends in practice regarding evidence-based nursing, an intensified interest in advanced practice degrees, and the rise of the Doctorate of Nursing Practice degree all necessitate inquiry into nursing's epistemological infrastructure. In this column, the author proposes a rationale and a framework for thinking about knowledge production in nursing practice.

Pamela G. Reed, Contributing Editor

For too long, nursing has sustained the myth of the theory-practice gap and promulgated science as distinct from the discipline's art or practice. The researcher has been portrayed as the *producer* who hands down scientific knowledge to the clinician: as the *applier* of knowledge, sometimes *supplier* of ideas or researchable problems, and maybe even *tester* of knowledge, but rarely the *producer.* This traditional model of nursing knowledge production not only misrepresents and constrains the knowledge potential in nursing, but it marginalizes the practitioner and distances patients from knowledge development. There is a great need for inquiry into whether and how nurses produce knowledge through their practice. The results are likely to extend the science of nursing practice well beyond descriptions of intuition and gut feelings.

Granted, knowledge from other sciences can be useful for application perhaps with some reformulation, and therefore does not need to be produced in the context of nursing practice. But to the extent that nurses strive to facilitate patients' resources and participation in care and healing processes, it seems logical that a nurse/patient practice-centered model rather than a researcher-centered model of knowledge production be employed. For example, knowledge generated through practice can more effectively address the thorny epistemologic problem of who can speak for others; practice-based knowledge equips the nurse to speak not *for* the patient, but *with* the patient (Alcoff, 1995).

Precursors to this *practice turn* in epistemology, so called by Rouse (2002), were evident in nursing over a half century ago. And during the last decade, scholars within and outside of nursing increasingly acknowledged the role of human practices in knowledge production and critiqued orthodox epistemology with its one path to scientific knowledge.

Editor's Note: Any comments about this dialogue should be addressed to the Editor for possible inclusion in Letters to the Editor. For other information, contact Pamela G. Reed, RN, PhD, FAAN, 5520 E. Silver Mine Place, Tucson, AZ 85721; phone: (520) 626-4038; e-mail: preed@nursing.arizona.edu

Nursing Science Quarterly, Vol. 19 No. 1, January 2006, 1-3
DOI: 10.1177/0894318405283545

Keywords: epistemology, nursing practice, nursing theory

Nursing

Mining for ideas about nursing knowledge in the conceptual models and theorists' publications turned up several statements where scholars had specifically described practitioners as knowledge producers. Over 50 years ago, Peplau (1952, 1992) presented her *cycle of inquiry* whereby the practitioner transformed practice knowledge into nursing knowledge. Peplau (1952, 1992) explained that the practicing nurse peels out theoretical explanations and formulates hypotheses, which are then validated and tested in the context of the nurse-patient relationship (Reed, 1996). Ellis (1969) conceptualized the *practitioner as theorist* and plainly stated that the practitioner was "not simply a user of given theory but a developer, tester, and expander of theory" (p. 1438). Paterson and Zderad (1976) outlined five phases in nursology, the phenomenological study of nursing practice. Researcher and practitioner roles were integrated and nurse-patient interactions produced theoretical *conceptions* derived from the local situation that held meaning across multiple situations. Roy (Roy & Obloy, 1978) described the practitioner as building knowledge through practice and, in fact, defined this as the process of nursing science. Diers' (1995) exemplary work on clinical scholarship over the past 25 years paved a way for clinicians to raise their clinical observations and stories to the "level of theory" (p. 27). More currently, there is an increasing number of nursing publications focused on nursing praxis as the *inseparability of theory/practice* (Connor, 2004; Doane & Varcoe, 2005). In particular, Rolfe (1996, 2000), professor and prolific writer from the United Kingdom who contributed to this column, has published several articles and books on this topic.

Science Studies

Outside of nursing, sociology and culture scholars from the field of science studies (see Hess, 1997, for an overview) and the writings by historians and philosophers of science indirectly provide vigorous support for the idea of regarding nursing practice as integral to nursing knowledge production. For example, Gibbons et al. (1994) proposed the now popular Mode 2 form of knowledge production that supplements traditional Mode 1 research approaches. Within the Mode 2 approach, knowledge evolves close to the *context of application* and in fact, knowledge is legitimized by its use. Pickstone (2000) theorized that ways of knowing are linked to one's work and ways of making things. The practice-centered philosophy of Shusterman (1997) suggested that the embodied experiences of practicing and receiving nursing care, and then reflecting upon these events, comprise a process that generates new knowledge. Moreover, historians have cautioned that the practice of science is much messier than that assumed to occur in traditional research. Pickering (1995) described science as a *mangle* of social, technical, conceptual, political, and personal practices. Last, Baird's (2004) recent philosophic inquiry into technology established important links between the intelligent use of instruments and scientific knowledge. Nurses' interfacing with technology in patient care provides another opportunity for knowledge production in the context of practice.

It is uncertain whether practitioners have or are able to take the practice turn in epistemology. Do they engage in nursing praxis and peel out theories from their interactions with patients to produce knowledge? Findings from Abbott's (1988) research into professions indicate that practitioners and the profession as a whole would benefit from theory-based knowledge production in practice. Based on his study of professions, Abbott concluded that *abstract thinking* was a dominant factor in determining whether professions had full jurisdiction over their practice. In his book, 17 years ago, Abbott (1988) put forth nursing as an exemplar of a profession with limited jurisdiction, implying that nursing lacked sufficient activity of abstract thinking in practice. Is this still so? A recent study by Larsen, Adamsen, Bjerregaard, and Madsen (2002) found that clinical nurses identified various sources of knowledge but denied *using*, much less *producing* theory in their practice.

Toward a Model of Knowledge Production

Knowledge production is conceptualized in this model as not only practice-centered, but also *theory-based*. It is proposed that practitioners are capable of integrating, or learning to integrate, theoretical thinking with data from patient interactions to develop knowledge relevant to patient care. This *practice theorizing* is envisioned to be a creative process that can be studied, taught, and facilitated. To theorize is to think abstractly and make links between the empirical and conceptual. Practitioners who function as theory-based knowledge producers can help bring about the discipline's realization of full jurisdiction over nursing practice.

This model does not exclude the researcher role in knowledge production. Partnerships between practitioners and researchers still hold. The researcher typically practices science without direct experience in nursing practice, employing methods of scientific inquiry that emphasize the empirical patterns of knowing. Knowledge produced by the researcher is characterized as scientific knowledge for nursing. The practitioner, on the other hand, practices science within the context of nursing care and produces knowledge of nursing by employing various patterns of knowing (aesthetic to technologic) to generate theories about healing processes that are facilitated by the caring acts of nursing practice.

Two basic assumptions underlie the model.

1. The practice setting is not only a place of knowledge application; it is a context wherein nurse-patient encounters generate important data for building nursing knowledge.
2. Knowledge production involves abstract thought and generation or refinement of nursing theory, at some level of theory.

Caveats and Conclusions

The characterizations of practitioner and researcher roles and other ideas put forth in the model admittedly are tentative and await further thought and dialogue. And the model begs for explanations about whether and how practitioners actually engage in the production of theory-based knowledge. Part of the answer lies in examining existing descriptions and theories about the various forms of human reasoning. Part of the answer will come from systematic study of practitioners in their daily work. And part of the answer resides in the goals and values nurses clarify concerning their science and practice.

Some may question the attention to nursing's epistemologic infrastructure in this column, given a general postmodern movement away from epistemology. But the concerns here shift from the classical normative epistemological stance to focus more on an empirical stance that seeks better explanation of the knowing process in nursing. Furthermore, this column, and Gary Rolfe's work that follows, provides evidence of a convergence of thought occurring independently across scholars, a phenomenon Lamb and Easton (1984) called *multiple discoveries*. In other words, multiple people are sharing discoveries, in this instance regarding an intensifying interest in the untapped role of practice in nursing knowledge production, a questioning of traditional views of science that have perpetuated the subordination of clinicians, and the pursuing of what it means to know, and identifying who are the legitimate knowers in nursing. It is hoped that more nurses will join the multiple discoveries unfolding concerning knowledge production in nursing practice.

References

Abbott, A. (1988). *The system of professions*. Chicago: University of Chicago Press.

Alcoff, L. M. (1995). The problem of speaking for others. In J. Roof & R. Wiegman (Eds.), *Who can speak? Authority and critical identity* (pp. 97-119). Chicago: University of Illinois Press.

Baird, D. (2004). *Thing knowledge: A philosophy of scientific instruments*. Los Angeles: University of California Press.

Connor, M. J. (2004). The practical discourse in philosophy and nursing: An exploration of linkages and shifts in the evolution of praxis. *Nursing Philosophy, 5*, 54-66.

Diers, D. (1995). Clinical scholarship. *Journal of Professional Nursing*, *11*(1), 24-30.

Doane, G. H., & Varcoe, C. (2005). Toward compassionate action: Pragmatism and the inseparability of theory/practice. *Advances in Nursing Science*, *28*(1), 81-90.

Ellis, R. (1969). The practitioner as theorist. *American Journal of Nursing*, *68*, 1434-1438.

Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., & Trow, M. (1994). *The new production of knowledge: The dynamics of science and research in contemporary societies*. Thousand Oaks, CA: Sage.

Hess, D. J. (1997). *Science studies: An advanced introduction*. New York: New York University Press.

Lamb, D., & Easton, S. M. (1984). *Multiple discovery: The pattern of scientific progress*. Trowbridge, UK: Avebury.

Larsen, K., Adamsen, L., Bjerregaard, L., & Madsen, J. K. (2002). There is no gap 'per se' between theory and practice: Research knowledge and clinical knowledge are developed in different contexts and follow their own logic. *Nursing Outlook*, *50*, 204-212.

Peplau, H. (1952). *Interpersonal relations in nursing*. New York: Putnam.

Peplau, H. (1992). Interpersonal relations: A theoretical framework for application in nursing practice. *Nursing Science Quarterly*, *5*, 13-18.

Paterson, J., & Zderad, L. (1976). *Humanistic nursing*. New York: John Wiley & Sons.

Pickering, A. (1995). *The mangle of practice: Time, agency, and science*. Chicago: University of Chicago.

Pickstone, J. V. (2000). *Ways of knowing: A new history of science, technology and medicine*. Manchester, UK: Manchester University Press.

Reed, P. G. (1996). Transforming practice knowledge into nursing knowledge—A revisionist analysis of Peplau. *Image: Journal of Nursing Scholarship*, *28*(1), 27-31.

Rolfe, G. (1996). *Closing the theory-practice gap: A new paradigm for nursing*. Oxford, UK: Butterworth-Heinemann.

Rolfe, G. (2000). *Nursing praxis and the reflexive practitioner: Collected papers 1993-1999*. London: NPI.

Rouse, J. (2002). *How scientific practices matter.* Chicago: University of Chicago Press.

Roy, C., & Obloy, M. (1978). The practitioner movement—toward a science of nursing. *American Journal of Nursing*, *10*, 1698-1702.

Shusterman, R. (1997). *Practicing philosophy: Pragmatism and the philosophical life*. New York: Routledge.

Nursing Praxis and the Science of the Unique

Gary Rolfe, RMN; PhD
Professor, School of Health Science, University of Wales, Swansea

Technical Rationality and the Theory-Practice Gap

The rise of research-based practice in the 1960s and 1970s and the growing influence of evidence-based practice over the past decade have served to establish technical rationality as the dominant discourse in nursing. The term *technical rationality* originated with Habermas (1970) and was employed by Schön (1983) to refer to the dominance of theory over practice (and hence of theorists over practitioners) and the one-way flow of information from research and researchers, through academic journals and textbooks, to nursing practice and practitioners. Under the rubric of technical rationality, new developments in nursing practice stem almost entirely from the findings of scientific (usually quantitative) research studies, and nurses are directed in their everyday practice by the writing of theorists.

However, the rise of theory (whether research-based *middle-range* theories or speculative *grand theories* and models) has also highlighted a gap or schism between theory and practice, in which the findings from research are not always smoothly translated or incorporated by nurses into their everyday practice. The most often cited resolution of the theory-practice gap was outlined by Hunt (1981) over two decades ago, and has been reiterated at regular intervals ever since. Hunt's explanations for the continued gap between theory and practice were the following: First, that nurses rarely read research reports; second, that when they do read them, they rarely understand them; and third, even when they do read and understand research reports, they are reluctant or unable to apply the findings to practice for a number of personal and structural reasons. For supporters of technical rationality, the resolution of the theory-practice gap is thus for practitioners to make a greater effort to read and apply the findings of *gold standard* (usually quantitative) research to their practice.

Despite a variety of challenges to the dominance of positivist and/or quantitative research methodologies as the driving force of technical rationality, very few writers have questioned the paradigm of technical rationality itself. This is, perhaps, hardly surprising, since most of these writers are themselves theorists rather than practitioners, and any challenge to the dominance of theory over practice is also, to a greater or lesser extent, a challenge to the dominance of theorists over practitioners. Thus, while most theorists appear happy with Hunt's (1981) suggestion that the existence of the theory-practice gap is due largely to a reluctance or inability by nurses to apply research findings to their practice, very few writers have dared to suggest that perhaps the problem is one of inappropriate findings resulting from inappropriate research methodologies.

This suggestion is based on the suspicion that the social sciences might perhaps not provide us with the most appropriate research methodologies for nursing. These methodologies emerged from the desire of early social philosophers such as Auguste Comte and Emile Durkheim to replicate the huge technical advances made in the physical sciences during the 19th Century, and were therefore based on a similar model to physics and chemistry. Furthermore, since these early social scientists wished to study large social groups, they opted for statistical methodologies, which sought to generalize from carefully selected samples to the populations which those samples represented. Even when qualitative methodologies were later developed in the social sciences, many of them attempted to make similar generalizations from samples to populations. For example, while Husserlian phenomenology is not concerned with *statistical* generalizations, it nevertheless combines data from several respondents in order to make general statements about the lived experiences of members of particular social groups. Similarly, ethnographers usually attempt to generalize at the level of societies, rather than individuals.

Toward a Nursing Science of the Unique

When these methodologies were introduced to nursing by the first wave of nurse researchers (most of whom had taken doctorates in the social sciences), the aim was similarly to theorize at the macro level of social groups; to construct theories about nurses and patients *in general*. While theorizing at this macro level is entirely appropriate in the social sciences, where we wish to say something about how societies function, we run into difficulties in nursing, where we are (or should be) concerned with individual nurses and individual patients in which no two settings of clinical encounters are ever the same. This can be seen from almost any definition of nursing practice, for example: Nursing consists of interactions between unique individuals, with unique experiences, and it always takes place in unique situations (Sarvimaki, 1988). Clinical nursing practice is (or, I would argue, should be) a series of unique encounters, each of which is different from all others. However, since the findings from social research are generalizable and relate to the average behavior of large groups, rather than to specific individuals within those groups, the application of research findings to practice is

Nursing Science Quarterly, Vol. 19 No. 1, January 2006, 4-8
DOI: 10.1177/0894318405284128

clearly problematic. The findings from social research are of an *order different* from those required by practitioners. As Gadamer (1996) pointed out,

> Once science has provided doctors with the general laws, causal mechanisms and principles, they must still discover what is the right thing to do in each particular case, and this is something which hardly seems to be predictable or knowable in advance. (p. **AUTHOR PLEASE INSERT PAGE NUMBER**)

It is tempting to regard this stance as anti-scientific, and thus as irrelevant to nursing science. However, I wish to propose a response to the problem of the theory-practice gap that is strongly scientific and yet, at the same time, not rooted in the paradigm of technical rationality.

This response takes as its starting point the distinction made by Toulmin (2003) between rationality and reason, and their respective roots in logic and rhetoric. Whereas technical rationality implies the singular *logical* application of theory to practice, the appeal to reason points toward a *rhetorical*, or discursive, science in which a two-way dialogue is opened up between theory and practice. However, this solution does not merely involve opening a channel of communication between theorist and practitioner, but rather in completely abolishing the distinction between the two. I am not simply advocating that practitioners should talk more to researchers, or even that they should attempt to publish in the nursing research journals, but that *they themselves* should become researchers. In other words, rather than practice being informed by science, nursing practice should reformulate itself as science if it is to address the problem of the theory-practice gap. What is required is not a science of large numbers, but a science of the unique. While the social sciences are concerned with theorizing about people, nursing science requires theories about individual persons.

This idea of nursing as a *practice* science rather than a *technical* science entails a re-examination of the aims of research. As Gadamer(1996) observed, we are concerned with a task of a quite different nature from traditional scientific research, of knowing the right thing to do in each particular case, rather than the thing that works most often in most situations. One way of approaching this task would be to conduct single-case research on the unique individuals that the nurse meets in each of her clinical encounters. While some traditional social research methods, such as case study and action research, sometimes do precisely that, it is hardly practical on an everyday basis. A more efficient, effective, and relevant approach for nursing would be for research to be integrated with practice itself, an approach referred to by Schön (1983) as reflection-in-action or experimenting-in-action. For Schön, while traditional research is applied to practice, experimenting-in-action regards research as a natural component of practice, and therefore as an activity in which all practitioners should be involved. This coming together of practice and research as part of the same act has also been referred to as *praxis* (Rolfe 1996).

Nursing praxis involves the nurse in generating *informal theories* about the unique clinical situations in which one is immersed, testing hypotheses derived from these theories by modifying practice, reformulating theories in response to changes in practice, re-testing new or revised hypotheses, and so on in a reflexive spiral. In this way, theory and practice are developed simultaneously in a process that involves the swift alternation between research and the application of that research as two sides of the same coin. Thus, the role of the researcher cannot be separated from the role of practitioner, because to practice is to research (Rolfe,1996).

Conclusion

The usual response when faced with the problems of technical rationality and the theory-practice gap is to reject the scientific method in favor of the artistry of nursing. In this column, I have attempted to place nursing artistry firmly within a scientific framework; to recast it, along with Schön (1983), as a form of on-the spot experimenting within clinical practice. That is not to say that the traditional technical-rationality model of science should be rejected; only that it should know its place. Findings from large-scale generalizable research are very useful when we require information about nurses, patients, or other social groups *en masse*; when, for example, we wish to make predictions about bed occupancy or response rates to medication. However, the essence of nursing is arguably the individual clinical encounter, and no two encounters are ever the same. The author of this column has therefore advocated a nursing science of the unique, a science of individual persons rather than groups of people, in which experimentation and practice are combined in a single act of nursing praxis, and in a single person of the practitioner-researcher. The following dialogue highlights points of interest from this column.

On Questioning the Paradigm of Technical Rationality and Knowledge Production

Pamela Reed (PR): = You wrote that very few writers have questioned the paradigm of technical rationality. Is that writers from the United Kingdom? It seems like I have seen considerable questioning of this paradigm in the literature, especially from those who conduct qualitative research here in the United States.

Gary Rolfe (GR): While many qualitative researchers in the United Kingdom have questioned (post) positivism, few have seriously questioned the relationship between theory and practice suggested by technical rationality. Thus, most qualitative researchers would still wish to produce generalizable knowledge and/or theory (although they might prefer the term *transferable* to *generalizable*) and would still wish their research findings to exert a direct influence over practice. The idea that the knowledge and theory generated by practitioners might be more important and relevant than traditional research knowledge is still re-

garded as challenging and perhaps threatening to many researchers.

On Practitioners' Ability to Participate in the Practice Approach to Knowledge

PR: How are you defining practitioners, that is, what educational level in nursing do they have? I ask because I think less educated nurses (less than masters or certainly less than a bachelors degree) may not be as capable of participating in this new approach to practice because they lack the theoretical background. Does your idea require a certain education level of nurse?

GR: I was using the term *practitioners* to apply to *any* qualified nurse who is working in a clinical practice setting. However, you have raised a very interesting question, particularly in relation to my distinction between rational (logical) and reasonable (rhetorical) judgments. It might be useful at this point to compare the distinction between rational and reasonable thinking with Benner's (1984), actually Dreyfus and Dreyfus's (1986), transition from novice to expert practitioner. For Benner, novice nurses work according to the technical rational paradigm by rationally applying existing theory to practice rather than by relying on their experiential reasoning or intuition. However, whether such a rational mode of practice is the natural way for novices to work, or whether it is simply that this is how we have taught (trained?) them to work is, I think, open to debate. In other words, is it possible to educate nursing students to think and act like researchers and to hypothesize about their practice (that is, to apply reasoning) from the very outset of their course of study? What theoretical background is required to reason rather than merely to rationalize about their practice, and is it available to beginners? Or, to use Gadamer's (1996) terminology, does wisdom (reason) only develop with experience, or is it a mode of thought open to the novice as well as to the expert? My personal view as an educator is that intelligent neophytes can quickly be taught to think and act reflexively, to theorize and reason about their own practice, rather than merely apply existing theory and research findings. Whether they should, of course, is another matter, and is largely the subject of my remarks in this column.

On the Types of Theories in Knowledge Production Among Practitioners

PR: Is there room in your proposal of knowledge production for practicing nurses to use existing scientific theories or knowledge in the process of developing their clinically-based theories?

GR: Most certainly. Although I am sometimes wrongly accused of rejecting research-based *scientific* knowledge in favor of something more woolly and nebulous, my position (briefly and probably over-simplified) is that nurses and other practitioners have knowledge from three broad sources at their disposal when engaging in a clinical encounter. First, there is *personal knowledge*, knowledge the nurses have about individual patients they are working with, gained mostly from the therapeutic relationships they have built up with patients. Personal knowledge also includes knowledge that the nurses have about themselves. Second, there is *experiential knowledge*, knowledge that the nurses bring to the clinical encounter from other, similar (but never identical) situations from their past experiences. Benner (1984) referred to this as the nurse's repertoire of past paradigm cases. And third, there is *propositional knowledge*, knowledge from research findings and textbooks that affirms information about general situations in which the nurses finds themselves.

I regard personal knowledge about individual patients (and about the nurse) as the most important and relevant knowledge when theorizing about the unique and personal clinical situation, followed by experiential knowledge about similar encounters in similar settings, followed by propositional knowledge about general situations. In answer to your question, then, existing scientific theories and knowledge play an important role in providing a general backdrop to inform the nurses' theorizing, and they also offer a vital fallback position when nurses have no personal knowledge about a patient and few similar cases in their experiential repertoire. You will note, however, that the usual *hierarchy of evidence*, with generalizable research findings at the top and personal knowledge at the bottom, has been completely reversed.

On the Science of the Unique, Definition of Science, and Popper's Theory of Knowledge

PR: I like your phrase *science of the unique*, but might it seem like a contradiction in terms, given the traditional view of science with its goal of generalizability of results. So, are you proposing that we redefine or extend our view of science in your use of that term?

GR: The short answer is that I believe that a science of the unique is a legitimate approach within our current concept and practice of science, and does not require any redefinition or extension of the term. The long answer raises two further questions. The first is whether we define science in terms of process or product; that is, by what scientists do or by the kind of knowledge (generalizable or otherwise) that they produce. The second question relates to what we mean by the traditional view of science. If by *traditional* we mean Bacon's (1989) original inductive method, then you are quite right to point out that there is a contradiction in terms. Induction involves collecting a number of individual examples and generalizing to the universal case. This is, of course, the logic by which many qualitative nurse researchers and also some quantitative nurse researchers operate. However, we also know about Hume's (1986) *problem of induction*; that is, that we can never make a *logical* leap from a finite number of individual instances (however large) to a universal principle.

This brings us to Popper's (1959) reformulation of the scientific method as *hypothetico-deductivism*. Popper rejected the view that science is defined according to its outcome in terms of producing generalizable laws and theories. In fact, he argued that science can never prove theories at all, but works by disproving or refuting hypotheses drawn from them. The *criterion of demarcation* between science and non-science therefore has nothing to do with outcome (generalizable or otherwise), but rather depends on whether theories are phrased in such a way that it is possible to devise ways of testing them. Furthermore, scientists are concerned not only with theories about the universal, but also about the particular. For example, one scientific theory might generate hypotheses about the motion of the planets in general, while another might generate hypotheses about the motion of one particular planet. Each theory is considered to be scientific to the extent that the hypotheses it generates are refutable, rather than according to whether it is generalizable.

PR: That's helpful. Also, as you probably already know, some philosophers of science think that Popper's (1959) theory of knowledge faces the same problem of induction in that one can never be sure that a given theory can never be falsified; that the next experiment might just refute the theory. Which leads me to be all the more open-minded about the possibility that clinical theorizing may give us an even more useful scientific method for developing knowledge, beyond Bacon (1989) and Popper!

GR: The fact that we can never be sure that a given theory can never be falsified is exactly Popper's (1959) point. We can be certain of nothing in science; all knowledge is provisional. I also think it is dangerous to start wishing for certainty (that way, madness lies!), especially in such an imprecise science as nursing. The point of clinical hypothesizing is to reduce the disparity between theory and practice and to generate theories that are more relevant to practitioners in their day-to-day work. This is not to say that these theories are true (unless we are taking a pragmatist stance on truth), but rather that they are useful. Rather than offering a scientific method that takes us beyond Popper, my view is simply that clinical hypothesizing is an accelerated version of Popper's hypothetico-deductivism that can compress into a single clinical encounter a process that sometimes takes decades in more traditional laboratory settings.

On On-the-Spot Experimenting and Science

PR: Is *on-the-spot experimenting* a proposal for another *scientific method* or method to build scientific knowledge outside of the traditional technical science model?

GR: This question is an extension of the earlier one about science. *On-the-spot experimenting* is concerned with formulating and testing hypotheses and plays an integral part in the hypothetico-deductive science of the unique. It is important to note in this respect that Popper regarded hypotheses as originating from many different sources, including *creative intuition* and everyday experience. The hypotheses formulated and tested on-the-spot by nurses in practice are therefore no less valid or scientific than those formulated by researchers in the laboratory.

On the Science of the Unique and Communities of Persons

PR: Can theories about individual persons also refer to theories about individual communities for those who do research at the community or systems level? Can we still have a science of the unique in terms of communities?

GR: Yes, I think we can, so long as we then resist the temptation to generalize from the community to its individual members. I used the example of individual persons because I was curious that the noun *person* has two different plural forms, and I wished to make the point that it is possible to conceptualize and work with the concept of multiple individual persons as well as with the collective concept of people.

On Micro Theories and Clinical Theorizing

PR: Is your idea of theories about individual cases similar to what nursing introduced several years ago as micro level or practice theories, in contrast to theories of the mid-range or more abstract levels? Though, I think you and I are envisioning a clinical theorizing that requires more abstract thought than that for micro-level theories.

GR: The concept of micro theory was introduced by the sociologist Merton (1968) in the 1960s to refer to small-scale or specific theories that can usually be tested by a single empirical study. Some writers regard micro theories as more or less identical to research hypotheses, so that any mid-range theory would generate a large number of micro theories, which could then be tested in a laboratory or practice setting. While such a concept bears similarities to my notion of informal clinical theories/hypotheses, there would appear to be a number of important differences. First, the purpose of micro theories is to test and refine mid-range theories, whereas the primary purpose of my informal theories is to test and refine practice interventions. Second, micro theories are usually constructed and tested by researchers, rather than by practitioners as part of their praxis. And third, informal theories are just that, informal and disposable. An informal theory is formulated and tested, practice is modified, and the practitioner/researcher casts it aside and moves on to the next informal theory. Informal theories are therefore largely instrumental and have little substantive knowledge-value in themselves.

On Scientific Knowledge and Patterns

PR: Doesn't scientific knowledge by definition describe *patterns* that apply to more than one case?

GR: While I agree that pattern description is one aim of science, I couldn't find a single definition of science that re-

gards even description, far less *pattern* description, as a necessary condition. I would, in any case, be very cautious about asserting anything of science by definition, since there appears to be no single definition that even the majority of scientists agree upon. However, I suspect that this question is actually a restatement of your earlier one about whether it is possible to have a science that applies to single cases. As a supplement to my earlier response, I would add Ridley's (2001) point that the universe is the ultimate unique single case, and to reject a *science of the unique* as unscientific would be to accept that science has no role to play, for example, in a study of the origin of the universe.

On the Meaning of Praxis

PR: Do you have the source you used to define praxis in your book? Praxis has several different meanings. I usually think of praxis as the *enactment of one's values*, rather than enactment of theories, but I have seen the terms used in various ways.

GR: If you are referring to my book *Closing the Theory-Practice Gap* (Rolfe, 1996), then my main source was Carr and Kemmis' (1986) excellent book *Becoming Critical*, where praxis is defined as *doing action*. You are absolutely right to say that the term praxis is used in a variety of different ways. Its original Greek meaning is difficult to translate, but is often conceptualized as doing action in contrast to *theoria* (theory) and *poietike* (making-action). You are also quite right to point to its original moral component of *phronesis*, which is to say, of acting justly and truthfully. However, I am using the term in its modern Marxist/critical theorist meaning of mindful action.

On the Theory-Practice Gap as Attributable to Using the Wrong Kind of Theory

PR: What reactions have you received from your colleagues about your ideas on the practice-theory gap?

GR: My formulation of the theory-practice gap as being a function of the application of the wrong kind of theory resulted in a great deal of debate when I first published it (Rolfe, 1993). However, it appeared to capture the imagination of many practitioners and some theorists, who saw it as a way of validating and empowering nursing practice and practitioners. The introduction and growing popularity of evidence-based nursing has recently revived an interest in the importance of practitioners formulating and testing their own hypotheses, and the challenge now is to explore how nurses can legitimate their own informal sources of evidence.

Beyond Intuition

PR: I am interested in how one might view it as no less valid or scientific than researcher-based theorizing. I find the idea of the practitioners formulating and testing their own hypotheses exciting, particularly since it goes beyond mere intuition and preserves the link to science and theory in knowledge production.

GR: Part of my incentive for this work is precisely the desire, as you put it, *to go beyond mere intuition*, since I always find it frustrating when practitioners claim that their mode of practice is tacit or based on gut feelings. While I appreciate that the intricacies of clinical practice might be difficult to put into words, I nevertheless share Schön's (1983) that, "When people use terms such as 'art' and 'intuition', they usually intend to terminate discussion rather than to open up inquiry . . . . These attitudes have contributed to a widening rift between the universities and the professions, research and practice, thought and action" (pp. vii-viii). I hope that my comments in this column and the subsequent dialogue between us will be read as a simple and honest attempt to *open up inquiry* in the spirit of scholarly collegiality.

References

Bacon, F. (1989). *The great instauration*. Arlington Heights, IL: Harlan Davidson.

Benner, P. (1984). *From novice to expert*. Menlo Park, CA: Addison-Wesley.

Carr, W., & Kemmis, S. (1986). *Becoming critical*. London: Falmer Press.

Dreyfus, H. L., & Dreyfus, S. E. (1986). *Mind over machine*. Oxford, United Kingdom: Basil Blackwell.

Gadamer, H. G. (1996). *The enigma of health*. Oxford, United Kingdom: Blackwell.

Habermas, J. (1970). *Toward a rational society* (J. Shapiro, Trans.). Boston: Beacon Press.

Hume, D. (1986). *A treatise of human nature*. New York: Penguin Classics.

Hunt, J. (1981). Indicators for nursing practice: The use of research findings. *Journal of Advanced Nursing*, *6*, 189-194.

Merton, R. K. (1968). *Social theory and social structure*. New York: Free Press.

Popper, K. R. (1959). *The logic of scientific discovery.* London: Hutchinson.

Ridley, B. K. (2001). *On science*. London: Routledge

Rolfe, G. (1993). Closing the theory-practice gap: Model of nursing praxis. *Journal of Clinical Nursing*, *2*, 173-177.

Rolfe, G. (1996). *Closing the theory-practice gap*. Oxford, United Kingdom: Butterworth Heinemann.

Sarvimaki, A. (1988). Nursing as a moral, practical, communicative and creative activity. *Journal of Advanced Nursing*, *13*, 462-467.

Schön, D. (1983). *The reflective practitioner.* London: Temple Smith.

Toulmin, S. (2003). *Return to reason*. Cambridge, MA: Harvard University Press.