

Sexual Science in the 21st Century: Where are we going?

A personal note

John Bancroft

The Kinsey Institute for Research in Sex, Gender, and
Reproduction, Indiana University

At the end of what has been called the first century of sex research, we can say with some confidence that human sexuality remains an enigma -- less so, no doubt, than when Alfred Kinsey entered the scene, but still mysterious in many ways. There are many who would have it remain that way. In one sense I agree with them. The contrast between the absurdity of human sexual expression (in the existential sense) and the rational dignity that we like to bestow upon ourselves is part of our saving grace. The last thing I want to see happen is for sex to become well ordered and rational. But I do want to see this potentially positive and interpersonally important (if absurd) aspect of the human condition managed responsibly, both at an individual and a societal level.

Many of the more important problems affecting the human race are related to sex in one way or another, encompassing, with paradoxical irony, both mortality and morbidity associated with sexually transmitted disease and overpopulation. The relationships between men and women, which at a fundamental level are related to sex, present some of the greatest challenges for human societies, as a large proportion of women worldwide continue to suffer from lack of control over their reproductive health and lives in sexually stratified cultures. The need for sexual science is as great today as it has ever been.

As we approach the end of this millennium there is an

obvious need to take an interdisciplinary approach. We cannot expect to understand human sexuality unless we consider both biology and culture (and it is important to stress culture, not just environment) and the interface between them as it affects the individual, the dyad, and the group. Yet at the same time we are in the midst of an epistemological crisis affecting much of the academic world: the apparently irreconcilable divide between positivist or essentialist science and postmodernism. Sexual scholarship is particularly affected, with its need to integrate an understanding of biology, traditionally positivist in approach, with an understanding of culture. This integration has not yet been achieved. We have seen a major impact of gay, lesbian, and feminist studies, predominantly in the postmodern mode. And those of us in the positivist camp should not underestimate the importance of this impact. We are witnessing an influx of intellectual ability unprecedented in the history of sex research. But in the process we are seeing the field divide. We cannot expect to see into the next millennium without having some idea of how this crisis is to be resolved.

There are, I believe, grounds for optimism. This can be seen as a dialectic process and as the synthesis emerges, as it probably will over the next decade, the wilder forms of postmodern intellectual anarchy and the grosser forms of determinism from the positivists should give way in a move

towards an intellectually healthier field with a more humble and realistic approach to knowledge. We have a way to go, but we're moving.

It is no coincidence that Volume 35 (February 1998) of The Journal of Sex Research, dedicated to the Use of Theory in Research and Scholarship on Sexuality, appeared close to the time a workshop was hosted at the Kinsey Institute on the Role of Theory in Sex Research, with neither enterprise being aware of the other. The proceedings of the Kinsey Institute meeting will also be published (Bancroft, in press - a). Until recently, in the more traditional field of sexual science, theory has been notable by its absence. These two attempts to engage it reflect the fact that there are people who want to bridge the epistemological gap and reach a synthesis. When their number reaches a critical mass it will happen.

I find myself caught up in this process. Having, at the very beginning of my career, passed through a phase of enthusiasm for first, psychoanalysis, and then, by means of some reaction formation, modern learning theory, I have spent most of my career as a researcher disillusioned with theory, behaving much as a typical positivist. The most important factor in my return to theory has been the growing sense of being overwhelmed by complexity at both ends of the spectrum, from molecular and cell biology to the complexity of sociocultural determinants. I came

to realize that if I was going to take the interdisciplinary approach seriously, I needed to simplify the complexity. That is how I see theory: as generating models of reality which are simplified and manageable. There is room for many such models, varying in where their usefulness lies. Some are restricted to a narrow focus, while others have a broad integrative picture. But they are all models of reality. That is not a reason to abandon scientific method in the Popperian sense -- its value remains unchallenged, in spite of those such as Kuhn (1970) who question how much it is properly used -- but rather to see it as only part of the process.

In the more clinical aspects of sexual science, we find that sex therapy is also in crisis at the present time. In part this is because we in the field have not taken the task of demonstrating its efficacy and value seriously enough. And that, in turn, is because of the complexity of the task -- just what is it that sex therapy strives to achieve? We tend to conceptualize this in terms of the treatment of sexual dysfunctions, while most of the time we focus our sex therapy on the sexual relationship. This issue has been brought into sharper focus as a consequence of the Viagra phenomenon. What is the difference between treatment with Viagra and sex therapy?

A close look at sex therapy finds considerable potential efficacy when dealing with communication problems, emotional

insecurity, unresolved resentment, and inappropriate sexual meanings. In some cases, that is all the therapist needs to do for worthwhile benefits to ensue. But we are basically in the dark when we come to the interface between such psychological mechanisms and the physiological responses which are fundamental to the sexual experience (see Bancroft, 1997, for a fuller discussion of this issue). Thus, it is much more difficult to predict the outcome of therapy in terms of improvement in erectile function or ejaculatory control, or an increase in sexual desire. Until we have some understanding of what must clearly be psychophysiological mechanisms, we should not expect to make the next much-needed step in improving the efficacy of sex therapy. And to gain that understanding we must first formulate theoretical models which allow us to grapple with the inherent complexity of such mechanisms.

Let me illustrate, with examples from our own research, how the use of such models can enable the integrative process through interdisciplinary cooperation, exploiting new technologies as well as new methodologies.

For more than 20 years I have been interested in the concept of central inhibition of sexual response as a possible factor in explaining psychogenic sexual dysfunction (Bancroft, 1970). In the last few years we have had, perhaps for the first time, real research opportunities to grapple with the concept, and in the

next few years there will be substantially more research opportunities.

From these opportunities has emerged the theoretical model which is guiding our male research program at the Kinsey Institute -- the dual control of central brain activity relevant to sex (Bancroft, in press - b). According to this model, sexual response results from a balance between central excitatory and inhibitory mechanisms. Individuals vary, it is postulated, in their propensity for both excitation and inhibition. Most of us have levels of inhibition proneness which keep us out of trouble (i.e., are adaptive); those who have too much are vulnerable to sexual dysfunction, while those with too little are more likely to engage in high-risk sexual behavior as a result.

The breakthrough in studying this concept in relation to erectile function came with the availability of drugs which, when injected into the penis, induced erection. This gave us the opportunity to investigate the interaction between the psychological state and peripheral target organ effect (Granata, Bancroft, Del Rio, & Carani, 1995; Kim & Oh, 1992), resulting in convincing evidence that some form of inhibitory signal from the brain was counteracting and, in some cases, overwhelming the peripheral target organ effect.

In order to pursue this theoretical concept we needed measures of inhibition and excitation proneness. We have made

good progress in developing a questionnaire for this purpose, and in nonclinical samples we find encouragingly normal distributions of scores (Bancroft, Janssen, & Finn, 1999). It is now possible to compare men with high and low measures of inhibition proneness, and to demonstrate interesting and relevant differences in their psychophysiological responses to erotic stimuli which contain threatening elements of a kind likely to invoke an inhibitory response (Janssen, Finn, Vorst, & Bancroft, 1999). We are pursuing the high inhibition group as relevant to sexual dysfunction, and the low inhibition group as relevant to sexual risk taking and compulsive sexual behavior.

Two recent technological developments offer the opportunity to take this theoretical model for research into new and exciting waters. In collaboration with our colleagues in radiology, we have just started to use fMRI scanning to identify localized areas of brain activity during sexual response. Our hope is that, with this technology, we will be able to localize where activity occurs in the brain when our putative inhibitory system comes into play. It will be crucial to show that what appears to be inhibition of response is, in fact, associated with increased activity of a certain kind and is not just lack of activity. So far, brain-imaging techniques have been used very little in sex research. Stoleru and his colleagues in France made an important start with PET scanning (Stoleru et al., 1999). In their most

recent study they compared men with normal and low levels of sexual desire, and found localized areas of brain activity in the low desire men suggestive of inhibitory mechanisms (Stoleru et al., 1998). We are following this up with our fMRI studies.

The next question is what determines individual differences in propensity for central inhibition? To what extent are genetic mechanisms involved, and to what extent learning? We are in the midst of an exciting time in the neurobiology of personality. Until recently personality research was based largely on questionnaire studies. Now, important developments in the neurobiology of mental illness have been extended into studies of personality, and we can include personality traits, such as inhibition proneness, relevant to sexuality. Even more recent are techniques for identifying genetic markers of potential relevance to personality traits. Hamer (1998) has reported preliminary results using a technique to measure variations in a serotonin transporter gene, and showing an association between variants of the gene and frequency of sexual behavior. Serotonin is likely to play an important neurotransmitter role in our putative central inhibitory system. An exciting prospect for the early part of the next millennium is the demonstration of support for our dual-control model based on psychological, psychophysiological, brain imaging, and genetic methods of research. Here we have an example of interdisciplinary sex research exploiting new technologies in

the biological and clinical sciences.

My other examples illustrate the need to develop interdisciplinary approaches to studying the effects of reproductive hormones on human sexuality, in particular the need to investigate the interaction between the direct hormonal (i.e., biological) and the cultural influences on the behavioral outcomes. The first of these examples comes from our research into the effects of steroidal contraceptives on the sexuality and well-being of women, an issue of worldwide relevance to the acceptability of modern contraceptives. In a World Health Organization (WHO)-funded study, we investigated women from two different cultures: Scotland and the Philippines. In that study, the women had already been sterilized -- hence they did not need contraception -- but volunteered for the study. This allowed us to incorporate a placebo condition, and to study the direct hormonal effects of the oral contraceptive (OC), free from the complexities of fertility control. We found a significant negative effect of a combined OC on sexual interest, but only in the Scottish women (Graham, Ramos, Bancroft, Maglaya, & Farley, 1995).

How could direct hormonal effects such as these be different according to the culture? There are two obvious explanations: (a) the Scottish women reported much more positive sexual lives at the outset, whereas the Filipino women, while reporting higher

frequencies of sexual intercourse, also showed less interest and enjoyment and therefore less scope for the negative impact of the hormone; and (b) the possibility that, even though we went to some trouble to make our British methods of assessment meaningful to the Filipino women, we still may have been missing some crucial sexual meanings for women in that culture. If we did not have a clear picture of sexual well-being for Filipino woman, then we should not expect to identify adverse changes from the OC. Both explanations deserve consideration.

In a recent study at the Kinsey Institute (Sanders, Bancroft, Graham, & Klein, 1999), the effects of steroidal contraceptives in women actually taking them for contraceptive purposes were assessed. Subjects were assessed in considerable detail before they started on the OC, and then followed up over a year. The study design was based on a theoretical model that allowed the interaction between psychosocial variables such as motivation for parenthood, attitudes to contraception, and the direct hormonal effects of the OC. More than 40% discontinued the OC within the first year, nearly 30% within the first 3 months. Discontinuation within the first three months was associated significantly more with decline in sexual interest and an increase in negative mood since starting the OC, associations more marked than for any other possible side effect we measured. It is staggering how little research attention has been paid to

these two effects of OCs: sexuality and mood. These results not only replicate the findings in the Scottish women in our first study, they also raise the important question of whether adverse effects on sexuality are relevant to acceptance and continuation with such methods in other cultures.

We have a lot of basic methodological work to do before such cross-cultural studies are feasible. In each culture we will need to establish the criteria for sexual well-being for women, and how a decline in such well-being might be measured. When we started to ask such questions we were confronted with the uncomfortable realization that we have no clear idea of such criteria for American women and how they might vary with age, socioeconomic, or ethnic group. Sexual well-being is a good example of a social construct that probably varies across such dimensions, one with which we have hardly started to grapple. This also has relevance to sex therapy. To what extent do sex therapists impose their own constructs of sexual well-being in their treatment?

There is a further example of relevance to men. In recent years a substantial amount of work has been done in seeking a hormonal contraceptive for men to use. In contrast to the story for women, where our somewhat isolated attempts to evaluate the effects of steroidal contraception on the sexuality of women have been carried out several decades later than they should have

been, the potential for a male hormonal method to adversely effect male sexuality has been high on the research agenda (e.g., Anderson, Bancroft, & Wu, 1992). The most likely approach to such male contraception involves administration of relatively high doses of testosterone, to suppress spermatogenesis. Hence, a recent study evaluated a new androgen, MENT, which may be safer for long-term use with less likelihood of adverse effects on the prostate because it cannot be reduced to 5-hydroxy-testosterone. But would it be as effective as testosterone in maintaining normal sexuality? This question was tackled by comparing its effects in hypogonadal men, using a well-established method where previous androgen replacement is withdrawn from the hypogonadal subject and the androgen under investigation administered in a double blind experimental design. Such a study was carried out directly comparing MENT with testosterone (Anderson et al., 1999). Interestingly, of the 20 hypogonadal men studied, ten were from Scotland and ten from Hong Kong. Of the several studies of this kind demonstrating the clear effects of testosterone withdrawal and replacement on male sexuality, this was the first to involve hypogonadal men from a culture outside of Europe or North America. Whereas the most robust, predictable, and direct effect of androgens on male sexual response, the maintenance of full erections (i.e., nocturnal penile tumescence (NPT)) during sleep, was apparent in both cultural centers, the more subjective

and behavioral effects (predictably observed in previous studies) were less evident in the Hong Kong subjects. Furthermore, the effects of testosterone withdrawal on mood, typically an increase in depression and irritability and a reduction in cheerfulness, was not apparent in the Hong Kong subjects. Once again we are faced with the need to explain manifestations of a direct biological effect which differ in contrasting cultural contexts.

Whereas in the first example I looked forward to some new and exciting technologies, in my other examples I have focused on the importance of social constructs, such as sexual well-being, and how they can be conceptualized and measured. Here we need collaboration between sex researchers of both biomedical and sociocultural persuasions, and the exploitation of qualitative methodologies which have only received attention in recent years.

Thus, we can enter the next millennium with some new and exciting prospects on our research agendas. Such enthusiasm and optimism should, however, be tempered by a note of caution. At the end of this millennium political obstacles to sex research, particularly in the United States, are almost as great as they ever were, and funding for sex research remains hard to come by. And with the exception of the many excellent gay, lesbian and feminist scholars who have been focussing on sexual issues in recent years, there is a reluctance for the brighter, straight young academics to enter the field, particularly men. The

academic world actively discourages them from doing so. Sexual science has not yet achieved the level of academic respectability necessary to change that. This situation, in a self-fulfilling fashion, contributes to the continuing tendency to marginalize sex research.

I remain modestly hopeful, though by no means certain, that the painful awareness of our ignorance about sexuality with which the latest sexual crisis, the HIV/AIDS epidemic, has again confronted us, will result in a positive change in that respect. I would also like to believe that, with the traditions of the academic world becoming increasingly vulnerable, the fact that sexuality is so intrinsically interesting as well as demonstrably important will have the desired effect of increasing its academic respectability. I hope I live long enough to see it.

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