

Epilogue

What did we learn from the interdisciplinary interaction in this colloquium? And what kinds of answers were provided to the questions that originally guided the organization of this colloquium? What are the tasks ahead to further the understanding of sexual motivation, appetite and desire?

In the search for an architecture of the steering of sexual behavior and sexual experience several concepts have been suggested. For example, Holstege and Broers refer to an emotional motor system, Herbert to a 'sexual' brain, Everaerd, Laan, Both and Spiering to a 'sexual system'. All these proposals have in common that specific sexual steering mechanisms are embedded in general control mechanisms of the brain. Tracing studies provide a graphic example of this point of view. Most authors embrace parallel processing or a systems approach to accommodate the complexities of interacting neural units and chemical messages. It is evident from work in this domain that no linear approach will be able to account for the multitude of facilitating and inhibiting neural interactions. For the time being, it is to be expected that with the increase of techniques to explore the brain and its functions, more complexities will be revealed.

All authors address the classic motivation question: how is action generated? There were different answers and on different levels, ranging from brain systems to dyadic interactions. The drive hypothesis, formulated for example by Freud, did not return in any of the presentations. What remains of that early debate about drive and homeostasis is the unresolved problem of how to conceive of an action mechanism. Herbert suggests that some hypothalamic homeostatic mechanism may be involved. The hypothalamus monitors the current level of gonadal steroids to set levels of sexual interest and sexual behavior. Once the hypothalamus has generated this set point a host of very complex processes has to follow before sexual expression is brought forth. All authors accept the primary role of sexual sensitivity or readiness of the brain over the influence of external sexual stimuli. Herbert's suggestion implies that we make a further step and have to accept that hypothalamic difference detection is a crucial requirement for sexual desire and behavior.

Although the importance of the hypothalamic detector remains to be established it may help clarify another important issue. Some authors, e.g., Wallen and Levin, assume some endogenous process that generates desire. According to Wallen, this endogenous process seems to be stronger and variable in men as compared to women. According to Levin this is a spontaneous process, possibly without the influence of an external (or internally generated) sexual stimulus. Limerence as conceived by Tennov is also an expression of a readiness to react with sexual love. The limerence reaction

springs into action full-blown and is unaltered by will or culture. Alternately, Everaerd, Laan, Both and Spiering hypothesize that unconscious processing of sexual stimuli may be responsible for the experience of spontaneity. In all views, there is an important role for sensitivity of the brain for sexual stimuli and its readiness to act on these stimuli.

The contributions of Heiman and Marshall widen the scope of the discussion because the validity of our considerations about sexual desire are now tested against clinical and social problems. Both authors seem to share the consensus about the neuroscience background with the other authors. However, they make clear that to understand the variations in sexual desire (e.g., hypoactive and hyperactive desire) we have to account for important developmental events and for relational-systemic aspects. The fine analysis of the phenomenological core of desire by Heiman helps us understand the complex meaning of desire and the many uses of desire. The observation that sexual desire makes sexual experience feel better, led her to distinguish desire *for* sexual action from sexual desire *during* sexual activity. Desire for sexual action may be associated with numerous meanings, concerns, hopes and expectations, which are not necessarily realized in sexual action. Marshall adds to Heiman's view because he proposes that developmental problems, here intimacy and attachment problems in childhood relationships, may be the cause of serious sexual disorders and sexual offending behavior.

What did we learn? There are now very useful paradigms to look into the generation of sexual action at very different levels of aggregation in animal and human organisms. Homology of brain systems among mammals may further our understanding of basic mechanisms (e.g., brain sensitivity for sexual stimuli, motor systems that generate specific sexual responses), but there are many constraints. Motivation, appetite and desire in animals are derived from behavioral indicators. However, desire in humans is an experience, which can be communicated mainly through verbal report.

What is ahead to further our understanding of sexual motivation, appetite, and desire? To improve interactions among researchers it should be specified which animal or animal brain system has validity as a model for human studies. To what extent are paradigms comparable? For example, which behavior in humans is comparable to lever pressing in male rats to get access to a female? This is particularly important when a paradigm is used to define a crucial concept, for instance, 'wanting' in the case of lever pressing.

Sexual excitement in humans is often associated with peripheral arousal (the feedback paradigm). It still is not clear to what extent peripheral feedback is necessary for sexual desire and sexual excitement. It would be more informative to monitor central arousal (a direct paradigm, measured, for example, with neuro-imaging or neurochemical probes), because knowledge about the time course of neural events could help resolve questions about what is experienced during sexual desire (e.g., peripheral arousal, central arousal). There is a need for a conceptual analysis of sexual desire as it is related to, for example, emotions, concerns, and motives. This may assist in arriving at better definitions of sexual desire, and it may induce ideas about what has to be regulated in cases of too little or too much desire.