

Jaak Panksepp (Ed.): *Textbook of Biological Psychiatry*.
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\$119.

The *Textbook of Biological Psychiatry* is aimed at a number of related disciplines who occupy their professional work at what Jaak Panksepp calls “the middle level of analysis where mental faculties can be related credibly to objective brain systems in ways which may be clinically productive” (p. 27). The book gives clinicians the information needed to perform state-of-the-art treatment, and at the same time it presents a conceptual framework with which to evaluate research that will be coming through our journals over the next period. Dr. Panksepp’s diplomatic and yet innovative stance pervades a work that represents many schools of thought and perspectives on both psychiatric disorders and clinical treatments.

The textbook is divided into three sections, “Foundational Concepts,” “Core Psychiatric Challenges,” and “Future Prospects.” In the first section, the reader is oriented in the most sophisticated way to basic ways of thinking about psychiatry, in which Dr. Panksepp gives his history of the field in the twentieth century. In the second chapter, he begins a discussion, cowritten with Mario Liotto, of radiological brain imaging and affective neuroscience. State and channel functions are a key idea here—that is, discrete informational/cognitive thinking can flow through distinct brain circuits—categorized and discussed by imaging changes in brain blood flow during an fMRI study. In contrast, moods are generated in a brainstem/limbic fashion. Drs. Panksepp and Liotto have an elegant illustration that shows the initiation and maintenance of an emotional state by switching off cortical regions, resulting in brainstem/limbic dominance—a structural/functional

diagram of how we “lose it.” As I know from repeated experience, at times of intense emotional upheaval I cannot think straight. Dr. Panksepp presents cogent explanatory neuroscience concepts that underlie this very common human experience.

Dr. Panksepp has suggested a number of concepts that are major potential innovations in neuropsychiatric thinking. The foremost of these is his synthesis of decades of rat research to create his seven “basic emotional systems,” which are then discussed. Dr. Panksepp has been able to delineate many of the neural pathways and neurotransmitters involved in the SEEKING, RAGE, FEAR, PANIC, PLAY, LUST, and CARE systems. These are distinct although presumably interrelated systems; one or another may be dominant at any particular time, determined by the interaction of the animal and the environment, with the SEEKING system in a sense as foundational for the potential activation of all the other discrete systems—massive lesions of the SEEKING system create akinetic mutism (AKM) and wipe out all emotion and affective arousal. Underlining the critical importance of emotion for all motivated behavior, this syndrome of midbrain AKM (discussed by Watt & Pincus in some detail in Chap. 3) shows the wipe-out of any spontaneous behavior and a very poor prognosis.

Dr. Panksepp’s basic emotional systems are delineated via helpful diagrams of rat brains, and yet they ring true introspectively and find many useful applications in patient care. This argues that the prototype states are part of our mammalian heritage and are remarkably well conserved phylogenetically in primate and hominid lines. For example, the SEEKING system is a rough neurobiological correlate to the psychoanalytic concept of drive. At the simple level of homeostatic demands, it informs our seeking of food, water, and other supplies; however, if

the midbrain is sufficiently exposed to addictive chemicals, the system can create drug cravings. Dr. Panksepp shows the ventral tegmental projections of this dopaminergic system coursing up through the lateral hypothalamus, where the homeostatic demands can generate the desire for food or water. Further on, the prefrontal system decides on optimal ways to satisfy the midbrain cravings, while the amygdala weighs the safety of approach to satisfying foods or persons.

The PANIC system is built into animals to insure that there will be a dysphoric signal if juveniles drift too far away from adults. The PANIC signal can be muted with antidepressant medications. FEAR is a different system, activated by physical dangers, prototypically the dangers reflected by predators or more dominant members of one's own species, but it can be potentially focused by cognitive processes onto any danger, which helps one to understand why anticipatory anxiety remains after panic attacks have been put into remission with medication. RAGE, a prototype state driving defensive and affective attack, is clearly separated from the cold aggression of predators such as wolves, rats, or humans, who are simply looking for a meal under the aegis of the SEEKING system. Love (CARE) and LUST are nicely differentiated via Dr. Panksepp's discussion of male and female neuropeptide-system differences. Maternal behavior and social bonding are spurred by oxytocin, which is stimulated by skin contact (including, powerfully, by massage) and orgasm. As he explains, both male and female sexual urges are abetted by oxytocin, although this neuropeptide is facilitated by estrogen and progesterone. In contrast, arginine-vasopressin is promoted by testosterone, spurs male sexual urges, and diminishes female sexual behavior.

Next comes Douglas Watt and David Pincus's chapter on consciousness—basically, what is it, and how does it work? Two qualities of their work stand out: a comprehensive review of the literature on this perplexing question, and a solid clinical grounding in lesion-based changes in consciousness. Their conclusion is that “consciousness reflects globally integrative processes derivative of neurodynamical interactions between multiple contributing brain systems, particularly communication between the critical triad of thalamus, brainstem and cortex.” In a final section discussing the difficulty of being more specific, they break the question down into evolutionary, neurodynamic, anatomic, and neurodevelopmental perspectives. In case the reader might be concerned that the discussion is too concrete and mechanistic, the final sentence in this section reads: “These considerations suggest that consciousness first develops within the milieu of a primary attachment to mother/parenting figures, and in the context of *affectively guided orienting toward and interacting with a primary caregiver.*” The “Foundational” section ends with chap-

ters on “Stress, sleep and sexuality,” “Psychobiology of personality disorders,” and a more technical description of “Functional neuroimaging.”

The “Core Psychiatric Challenges” section begins with Helen Mayberg's chapter on depression, which describes her work on imaging brain structure and function. Among other things, one learns that decreased frontal lobe function is a consistent finding in depression. Treatment responders to fluoxetine show decreased blood flow to limbic-paralimbic and striatal areas and increased blood flow to brainstem and dorsal cortical increases (prefrontal, anterior cingulate, posterior cingulate, parietal). Dr. Mayberg then explains that responders to cognitive-behavioral therapy show different brain changes: “lateral prefrontal decreases, similar to those seen with interpersonal psychotherapy, as well as medial frontal decreases and hippocampal and rostral cingulate increases. These CBT-specific changes are particularly interesting given current cognitive models and the known roles of rostral cingulate and hippocampus in emotional monitoring and memory and lateral and medial frontal cortices in perception, action, and self-reference.”

Fredric Busch and Barbara Milrod, both psychoanalysts, write about panic disorder with a neuro-psychoanalytic sensibility. Their discussion ranges from anatomical considerations of potential roles played by periaqueductal grey and the nucleus of the solitary tract, through the false suffocation-alarm model of Klein, to a comparison of cognitive-behavioral and psychoanalytic models and treatments. I learned that, in contrast to antidepressants, benzodiazepines can damp the response of the patient to psychotherapy.

This 300-page section on core clinical issues also includes chapters on mood disorders, schizophrenia, posttraumatic stress disorder, panic disorder, obsessive-compulsive disorder, and the various kinds of dementia. My experience was that the most thought-provoking section was that by Dr. Panksepp, this time writing with Bradley Peterson, about “The biological basis of childhood neuropsychiatric disorders.” The genetics and neurobiological substrates of childhood disorders such as “fragile X” or “Williams syndrome” can now be explained to a significant extent. Thus we can understand how a genetic change leads to a biological change which leads to a behavioral change.

The final, “Future Prospects” section again had a series of interesting conceptual chapters. Oliver Turnbull and Mark Solms reprise their book, *The Brain and The Inner World* (Solms & Turnbull, 2002). Potential neural-system substrates of old concepts in psychoanalytic thought are suggested in fascinating cases of patients with specifically demarcated brain lesions, and by the changes in thinking wrought by these lesions. Frontal lesions lead to “primary-process thinking”: confabulation, exemption from mutual contradiction, timelessness,

replacement of external reality by psychic reality, and mobility of cathexis. For example, a man with bilateral frontal lesions was delighted to meet on the neurology service a friend who had died 20 years earlier. A woman with frontal disease greeted her husband during his visits, but also insisted that her husband was the patient in the next bed when her real husband was not present.

The third section includes an informative chapter on somatic treatments by Nahas, Lorberbaum, Kozel, and George which begins with electroconvulsive treatment but goes on to magnetic seizure therapy, transcranial magnetic stimulation, and vagus nerve stimulation. Psychoanalyst Marcia Kaplan discusses combining psychoanalysis and psychopharmacology. Gardner and Wilson explain "Sociophysiology and evolutionary aspects of psychiatry." I found their review of the research showing lower-status animals more prone to substance abuse fascinating.

A major problem in the psychiatric literature is the ubiquitous and potentially distorting influence of the pharmaceutical industry on the clinical evaluation of virtually any psychotropic medication. As Marcia Angell (2000) wrote in a *New England Journal of Medicine* editorial introducing an article comparing the treatment of depression with nefazodone, with psychotherapy, or with both, "Young physicians learn that for every problem, there is a pill (and a drug company representative to explain it)." As *NEJM* representatives "spoke to research psychiatrists about writing an editorial on the treatment of depression, we found very few who did not have financial ties to drug companies that make antidepressants," and eventually the journal resorted to a reviewer from Scotland. From this perspective, I found Dr. Panksepp's last chapter, cowritten by Jaanus Harro, a most innovative and "scientifically autonomous" discussion of psychopharmacology. They discuss the issue of psychotropics from the vantage points of affective neuroscience; evolved emotional operating systems in the mammalian brain; and social neuroscience—the neural systems underlying social experiences.

Drs. Panksepp and Harro discuss many potential novel and foundational concepts for all of psychopharmacology. They note here that any pill (or, for that matter, any supportive ministrations) will help due to placebo effects: simply giving any medication or supportive attention stimulates brain endorphins and upregulates serotonin. Dr. Panksepp gives an alternative conceptual basis for psychotropics in emphasizing the neuropeptides as critical modulators (such as corticotrophin-releasing hormone, cholecystokinin, orexin, opioids, oxytocin, etc), offering a more specific way of tweaking the prototype emotional systems than is afforded by psychiatry's current emphasis on the classical monoamines. A great case in point here, outlining the promise of the peptidergic approach, is found in narcolepsy, where Panksepp ex-

plains that an autoimmune attack or receptor mutation leads to loss of orexin neurons. New pharmacotherapeutic agents with orexigenic activity may allow treatment of disorders of wakefulness without the side-effects of amphetamines. So while the specific "how to" of basic psychiatric disorders is covered under the "Core Psychiatric Challenges" section, Dr. Panksepp's final chapter envelope of "Neuropeptide goals and strategies" outlines heuristic connections between a "big-picture" view of affective controls in the brain, and the nuts and bolts of clinical therapeutics that are potentially the agents of our future psychiatry.

Returning to his neuro-psychoanalytic sensibility, Dr. Panksepp concludes this chapter with a summation that follows specific information, such as: "several lines of evidence suggest that periconscious, affective processing of emotion takes place subcortically, in areas such as the brainstem, hypothalamus, and amygdala, while cognitive appraisal of emotions takes place in the prefrontal cortex and the anterior cingulate cortex." Panksepp notes that during the twentieth century, the various instinctual operating systems of the mammalian brain (reflected in his concept of the prototype emotional states) were largely marginalized in both psychiatry as well as neuroscience, with only psychoanalysis hinting at their outlines, in such concepts as the "id" and the "dynamic unconscious." These operating systems could and should become a fundamental focus point for psychiatry, particularly in the twenty-first century.

This book should be of help to persons who are at a training level and are wishing to acquaint themselves with basic concepts. This textbook would also be of value to someone trained as a psychologist, neuropsychologist, psychiatrist, psychoanalyst, neurologist, or neuroscience researcher who might want to be more informed regarding the contributions of related disciplines. And finally, as one who has suffered through reading many abstract and detailed papers with the perpetual feeling that there must be many more important developing areas that I had to be unaware of, Dr. Panksepp gives us his review of the entire scope of biological psychiatry and then has a stable of experts each giving cogent, interesting overviews of their specific areas.

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