## References

- 1. Committee on Science, Engineering, and Public Policy, "Report of the Research Briefing Panel on Neuroscience" (Washington, D.C.: National Academy Press, 1983).
- 2. This section was prepared by OTA based on material obtained in large part through the summer course in Neurobiology of the Marine Biology Laboratory at Woods Hole, Mass. The course was sponsored by the National Institutes of Health and the Grass Foundation. Other sources include course notes prepared for Harvard Medical School by David D. Potter and Edwin J. Furshpan, and several textbooks. The books used most extensively were: E. R. Kandel and J. H. Schwartz, *Principles of Neural Science (New York: Elsevier, 1981)*; and S, W. Kuffler and J. G. Nicholls, *From Neuron to Brain: A Cellular Approach to the Function of the Nervous* System (Sunderland, Mass.: Sinauer Associates, 1976).
- 3, Braun, P., et al., "Overview: Deinstitutionalization of Psychiatric Patients, a Critical Review of Outcome Studies," *American Journal of Psychiatry 138:736-749, 1981;* Feldman, S., "Out of the Hospital, Onto the Streets: The Overselling of Benevolence)" *The Hastings Center Report, June 1983*, pp. 5-7.
- 4, Sharfstein, S. S., Deputy Medical Director, American Psychiatric Association, personal communication, September 1983.
- 5. The phrase is taken from Dr. Gerald Klerman, cited in reference 4.
- Fleckenstein, A., "Specific Pharmacology of Calcium in Myocardium, Cardiac Pacemakers, and Vascular Smooth Muscle," Annual Review Pharmacology and Toxicolo# 17:149-166, 1977; Reuter, H., "Calcium Channel Modulation by Neurotransmitters, Enzymes, and Drugs," Nature 301:569-574, 1983.
- 7. Campbell, W. C., et al., "Ivermectin: A Potent New Antiparasitic Agent," Science 221:823-828, 1983.
- 8. Wang, C. C., "Current Problems in Antiparasite Chemotherapy," *Trends in Biochemical Sciences* 7:354-356. October 1982.
- 9. de Kretser, D. M., "Agents for Male Fertility Control," Trends in Pharmacological Sciences 4:221-223, May 1983; Harper, M. J. K., "Prospects for New or Improved Birth Control Technologies by the Year 2000 A. D.," working paper, vol. II, pt. A, for World Population and Fertility Planning Technologies, the Next 20 Years (Washington, D.C.:

- U.S. Congress, Office of Technology Assessment, OTA-HR-157, February 1982).
- Grabowski, H. G., and Vernon, J. M., "The Pharmaceutical Industry," Government and Technical Progress, a Cross-Industry Analysis, R. R. Nelson (cd.) (New York: Pergamon Press, 1982), pp. 283-360.
- 11. Idanphan-Heikkila, J., "New Drug Permits," National Center for Drugs and Biological, Food and Drug Administration, Department of Health and Human Services, June 1983.
- 12, Molner, S., contract on drug development prepared for OTA, May 1983.
- 13, American Psychiatric Association, *Diagnostic and Statistical Manual*, 3d ed. (Washington, D.C.: American Psychiatric Association, 1980).
- Bartus, R., "Workshop on Impacts of Neuroscience)" Office of Technology Assessment, July 27, 1983.
- Personal communication from officials at the National Institute of Mental Health and National Institute on Neurological and Communicative Disorders and Stroke, August 1983.
- Anger, W. K., "Neurobehavioral Testing of Chemicais: Impact on Recommended S~andards," Neurobehavioral Toxicology and Teratology, in press, 1983.
- 17. Cravioto, J., "Nutrition, Stimulation, Mental Development and Learning," *Nutrition Today*, September/October 1981, pp. 4-15; Correa, H., *Population, Health, Nutrition, and Development*, D. C. Heath & Co., 1975, Pp. 15-16.
- 18. Nelson, B, K., Brightwell, W. S., Setzer, J. V., and O'Donohue, T. L., "Prenatal Interactions Between Ethanol and the Industrial Solvent 2+thoxyethanol in Rats: Neurochemical Effects in Their Offspring," Neurobehaw" oral Toxicology and Teratology 4:395-401, 1982.
- 19. Voorhees, C. V., "Environmental Assaults on the Nervous System and Human Behavior: A New Health Challenge," symposium at the Annual Meeting of the American Association for the Advancement of Science, Jan. 8, 1982; citing Smith, D. W., "The Fetal Alcohol Syndrome," *Hospital Practice*, October 1979, pp. 121-128.
- Schaumburg, H. H., and Spencer, P. S., "Selected Outbreaks of Neurotoxic Disease," Experimental and Clinical Neurotoxicology, P. S. Spencer and H. H. Schaumburg (eds.), 1980, pp. 883-889.
- 21. Wood, R. W., Weiss, A. B., and Weiss, B., "Hand

- Tremor Induced by Exposure to Inorganic Mercury," Archives of Environmental Health 27:249-252, 1973.
- 22 Johnson, B. L., and Anger, W. K., "Behavioral Toxicology," Environmental and Occupational Medicine, W. N. Rom (cd.), 1983, pp. 329-350.
- 23 Silbergeld, E. K., "Experimental and Environmental Neurotoxins: Correlation of Behavioral and Biochemical Effects," Behavioral Models and the Analysis of Drug Action, M. Y. Spiegelstein and A. Levy (eds.), 1982, pp. 297-315; Silbergeld, E. K., "Current Status of Neurotoxicology, Basic and Applied)" Trends in Neuroscience 5:291-294, 1982.
- 24. Santos, Y., personal communication from the House Select Committee on Aging. Ms. Santos cited: National Institute on Drug Abuse, Series 30, #2: Inhalants, National Institute on Drug Abuse Clearinghouse, Washington, D. C., July 1978; Sharp, C. W., and Brehm, M. L. (eds.), Review of Inhalants: Euphoria to Dysfunction, Department of Health, Education, and Welfare, Publication No. 80-553, Washington, D.C., 1977; Wyse, D. G., "Deliberate Inhalation of Hydrocarbons—A Review," Canadian Medical Association Journal 108:71-74, 1973; another relevant reference is: Commission of Inquiry into the Non-Medical Use of Drugs, Final Report, Ottawa: Information Canada, 1973, see especially app. A-9: "Volatile Substances: Solvents and Gases.
- 25. The Effectiveness and Costs of Alcoholism Treatment, Health Technology Case Study 22, part of the OTA Assessment of Medical Technology and Costs of the Medicare Program (Washington, D.C.: U.S. Congress, Office of Technology Assessment, OTA-HCS-22, March 1983).
- 26. Enloe, C. F., "Thalidomide II," *Nutrition Today*, January/February 1982, pp. 16-17.
- 27. Hiatt, F., "One-third in Military Affected by Alcohol," Washington Post, Aug. 26, 1983, p. A13.
- 28. Nicholi, A. M., '(The Nontherapeutic Use of Psychoactive Drugs, A Modern Epidemic)" New *England Journal of Medicine* 308:925-933, 1983.
- 29. Terenius, L., "Characteristics of the Receptor for Narcotic Analgesics in Synaptic Plasma Membrane Fraction From the Rat Brain)" Acta Pharmacologia Toxicologic 33:377-384, 1973; DeWied, D., and Jones, J., "Neuropeptides Derived From Pro-opiocortin, Behavioral, Physiological and Neurochemical Effects," Physiological Review 62:976-1059, 1982; Marx, J. L., "Synthesizing the Opioid Peptides," Science 220:395-397, 1983; Rossier, J., and Chapouthier, G., "Brain Opiates," Endeavor, New Series 6:168-176, 1982.
- 30. Taste, D. L., et al., "Stanford Research Institute:

- Shift Work Practices in the United States," Department of Health, Education, and Welfare Document No. 77/148 available through the National Technical Information Service as PB-274-707, March 1977; Moore-Ede, M. C., Czeisler, C. A., and Richardson, G. S., "Circadian Timekeeping in Health and Disease: Part 2, Clinical Implications of Circadian Rhythmicity," New England Journal of Medicine 309:530-536, 1983.
- 31 Hearings before the Subcommittee on Oversight and Investigations, House Committee on Science and Technology, Mar. 23, 1983; Hamburg, D. A., et al., Institute of Medicine: Health and Behavior (Washington, D.C.: National Academy Press, 1982).
- 32. Czeisler, C. A., Moore-Ede, M. C., and Coleman R. M., "Rotating Shift Work Schedules That Disrupt Sleep Are Improved by Applying Circadian Principles," *Science* 217:460-463, 1982.
- 33. Commercial Biotechnology: An International Analysis (Washington, D. C.: U.S. Congress, Office of Technology Assessment, OTA-BA-218, January 1984).
- 34. Pharmaceutical Panel, Committee on Technology and International Economic and Trade Issues, Office of the Foreign Secretary, National Academy of Engineering, and Commission on Engineering and Technical Systems, National Research Council, The Competitive Status of the U.S. Pharmaceutical Industry (Washington, D.C.: National Academy Press, 1983).
- 35. Brown, G. L., et al., "Aggression, Suicide, and Serotonin: Relationships to Cerebrospinal Fluid Amine Metabolizes," American Journal of Psychiatry 139:741-746, 1982.
- 36. Bird, S., "Social Impacts of Neuroscience," see accompanying working papers for this report.
- 37. Benbow, C. P., and Stanley, J. D., "Sex Differences in Mathematical Ability: Fact or Artifact?" *Science* 210:1262-1264, 1980.
- 38. Gilligan, C., In a Different Voice: Psychological Theory and Women's Development (Cambridge, Mass.: Harvard University Press, 1982).
- 39. Frank, R. T., "The Hormonal Causes of Premenstrual Tension," Archives Neurology and Psychiatry 26:1053-1057, 1931.
- 40. Gonzalez, E. R., "Premenstrual Syndrome: An Ancient Woe Deserving of Modern Scrutiny," Journal of the American Medical Association 245: 1393-1396, 1981.
- 41. Schafer, A. T., and Gray, M. W., "Sex and Mathematics," Science 211:31, 1981.
- 42. "Mathematical Ability: Is Sex A Factor?" letters to Science 212:114-121, 1981.
- 43. Ross, A. O., "Behavioral Therapy With Children,"

- Handbook of Psychotherapy and Behavioral Change: An Empirical Analysis (2d cd.), S.L. Garfield and A. E. Bergin (eds.) (New York: Wiley, 1978), pp. 599-602.
- 44. Bazelon, D. L., "Statement Delivered at Workshop on Impacts of Neuroscience," Office of Technology Assessment, July 27, 1983.
- 45. Bazelon, D. L., "Governing Technology: Values, Choices, and Scientific Progress," *Technology in Society* 5:15-25, 1983.
- 46. Gutheil, T. G., and Appelbaum, P. S., "Substituted Judgment: Best Interests in Disguise," The Hastings Center Report, June 1983, pp. 8-11.
- 47. The President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research has issued several reports related to topics influenced by neuroscience. These are listed, and are available through the Government Printing Office: Summing Up, Defining Death, Making Health Care Decisions (covering informed consent), Screening and Counseling for Genetic Conditions, Implementing Human Research Regulations, and Protecting Human Subjects.
- 48. Arkin, H. R., "Forcible Administration of Antipsy-

- chotic Medication," Journal of the American Medical Association 249:2784-2785, 1983.
- 49. American Psychiatric Association, statement on the insanity defense, December 1982.
- 50, Mercer, J. R., Labeling the Mentally Retarded (Berkeley, Calif.: University of California Press, 1973).
- 51. Gomberg, I. L., and Atelsek, F. J., *Neuroscience Personnel and Training* (Washington, D. C.: American Council on Education, 1983).
- 52, Matthews, W., Director, Budget Office of the National Institute of Neurological and Communicative Disorders and Stroke, National Institutes of Health, personal communication, June 1983.
- 53. National Research Strategy for Neurological and Communicative Disorders, National Institutes of Health publication No. 79-1910, June 1979.
- 54. Matthews, W., Director, Budget of the National Institute on Neurological and Communicative Disorders and Stroke, National Institutes of Health, personal communication, September 1983.
- 55. General Accounting Office, U.S. Congress, Multiyear Authorizations for Research and Development, Publication No. PAD-81-61, 1981.