ALCOHOLISM IN A SHOT GLASS

A POSSIBLE BRIDGE BETWEEN THE NEUROCHEMISTRY OF DREAMING & BLACKOUTS

JEROME D. LEVIN PH.D.

Appendix:

A Possible Bridge Between the Neurochemistry of Dreaming and Blackouts

Jerome D. Levin Ph.D.

e-Book 2016 International Psychotherapy Institute

From *Alcoholism in a Shot Glass: What You Need to Know to Understand and Treat Alcohol Abuse* by Jerome D. Levin

Appendix:
A Possible Bridge Between the Neurochemistry of Dreaming and Blackouts

In this appendix I would like to explore and suggest a possible link between the neurochemistry of dreaming, the pharmacology of alcohol, the disruptive effect of alcohol on REM sleep, and palimpsets (blackouts). The theory of dreaming I am drawing on is Jonathan Winson's (1990), summarized in his article "The Meaning of Dreams." (See also Winson, 1985.)

There are a number of competing theories about the function and mechanisms of dreams. The best known of these are Freud's theory of the psychological meaningfulness of dreams as compromise formations, which give disguised expression to repressed,

forbidden wishes and drives; the Hobson-McCarley activation-synthesis hypothesis that dreams are the cortex's best fit interpretation of random stimulation from the brain stem and are inherently psychologically meaningless; and the Crick-Mitcheson reverse learning theory that holds that information overload from the day's experiences prevents orderly storage of relevant information into memory and that REM sleep with its concomitant dreaming erases spurious associations allowing the coding and storage of information to proceed. The later theory has been summarized as "We dream to forget." The trouble with this theory is that the dreamer has to "know" what to forget and what to retain for processing, and the theory provides no criterion for, nor mechanism of, such a discrimination. Hobson has abandoned the position that dreams are

psychologically meaningless and now holds that the order imposed on the random spikes from the brain stem is a function of the personal view of the world and of remote (childhood) memories of the dreamer.

Winson believes that dreams are meaningful and that they play a vital role in the processing of memory. He bases his theory partly on evolutionary evidence and partly on studies of the hippocampus, REM sleep, and theta rhythms. The hippocampus is a subcortical brain structure importantly involved in learning and in memory; REM sleep is the sleep stage during which dreaming occurs; and theta rhythms are brain waves that occur during survival behavior and during dreaming in most mammals. According to this theory, dreams are a nightly record basic to the mammalian

memory process, and a means by which animals form strategies for survival by evaluating current experience.

Sleep in healthy human adults normally follows a pattern of stages from hyponogogic to slow wave to rapid eye movement (REM) to slow wave to REM to slow wave to REM to slow wave to REM. A similar pattern prevails in all marsupial and placental mammals. REM sleep is under the control of the brain stem. Pontine-geniculate-occipital (PGO) electrical spikes go from the pons in the brain stem to the visual processing center in the occipital lobe of the cortex demonstrating electrochemical transmission along this path. At the same time, theta wave activity can be measured.

Theta waves are 6 cycles per second (CPS) brain waves found in the hippocampus of animals during survival behavior: predation in the cat, apprehension of danger in the rabbit, and exploration in the rat. Each of these behaviors is not rigidly genetically controlled and requires response to changing environmental conditions. Theta waves accompany the REM sleep of all of these species. They can be measured in the hippocampus where they probably play a vital role in memory processing. Egg laying mammals (montremes) do not have REM sleep, nor do they dream. This evolutionary evidence suggests that REM sleep has survival value for higher mammals. Winson argues that theta waves reflect neural processes whereby information essential for survival (Freud's "day residues") are reprocessed into memory during REM

sleep.

The basic mechanism of memory is believed to involve *Long-Term-Potentiation* (LTP), a process in which relatively enduring changes in nerve cells are induced by intense electrical stimulation. After tetanic (high frequency electrical) stimulation of the pathway from the cortex to the granule cells of the hippocampus, a single electrical pulse causes rapid firing, far above baseline, of the granule cell neurons. The potentiation of these neurons is considered a model for memory, a mechanism by which neural structure and function is altered. LTP is induced by activity of the N-methyl-D-aspartate (NMDA) receptor. This receptor molecule is embedded in the dentrites of the neurons of all of the above mentioned structures

and circuits. The NMDA receptor is activated by a neurotransmitter, the amino acid, glutamate. Glutamate opens a non-NMDA channel that permits the entry of sodium ions from the intracellular space depolarizing the neuron. NMDA is unique among receptor molecules because it can be further activated by glutamate opening a second channel that allows the influx of calcium ions (Ca^{2+}). Ca^{2+} serves as a "second messenger"; its presence in the cell provides additional electric stimulation eventuating in LTP. LTP is caused naturally by theta waves activating NMDA receptors. Thus, NMDA in the presence of theta waves provides the neurochemical basis for long-term storage of biologically significant information.

It has been demonstrated that hippocampal

neurons that fire during neural mapping of survival information also fire during REM sleep, which suggests that re-mapping or re-processing is occurring. Non-REM mammals (metromes) have a large amount of neo-cortex; REM mammals have proportionately less; they do not need it to interpret, integrate, and reprocess survival information. The information being re-processed is both motor and visual, and inhibition of motor, but not eye, activity is required if REM is not to be interrupted. And, indeed, motor inhibition is characteristic of REM states.

So each species processes information vital to its survival: location of food, means of predation, or escape strategies. In REM sleep this information is re-accessed and integrated with past experience to form a

survival strategy for the future. Since animals don't have language their dreams are visual, so are those of humans. This suggests that human dreams reflect individual strategies for survival. Experiments have demonstrated that people dream about current crises and try to work out strategies for dealing with them in their dreams. Dreams are hard to interpret because the associations the neocortex brings to them are complex. These associations tend to reflect childhood experiences. Dreams give us access to and themselves constitute an infrastructure by which new experience is compared to past and integrated.

This brings us to alcohol. The pharmacology of ethanol is still poorly understood but two types of mechanisms have been demonstrated (see chapter 1).

The classical theory holds that alcohol asserts its effect by disorganizing the fatty material in the cell membrane of the neuron, which in turn disorganizes and disrupts the functioning of the receptor protein molecules embedded in those fatty layers. The trouble with this theory is that effects of alcohol on these phenomena, particularly in low doses, is too small to account for the subjective and behavioral consequences of drinking. More recent theories have demonstrated and highlighted ethanol's direct effects on nerve cell receptors, particularly on the NMDA receptor (the recognition site for glutamate that activates the second messenger system by opening a channel for Ca^{2+}). The response of the neuron to glutamate is greatly reduced by alcohol. (The effects of alcohol on the GABA receptor also plays an important

role in intoxication.) But, as we saw above, the glutamate-NMDA-Ca^{2+} second messenger system is the basis of LTP which in turn is the basis of memory. Further, it is well known that alcohol disrupts and disturbs REM sleep, in fact, reducing it; and that REM rebound occurs when drinking ceases. NMDA plays a vital role in the hippocampal-neocortex re-processing that occurs during REM. If alcohol blocks NMDA functioning, preventing LTP during REM, this may be the mechanism of blackouts. The kind of blackouts where there is no recall at all may be due to the lack of REM re-processing that results from alcohol's blockage of LTP by the NMDA-glutamate-Ca^{2+} mechanism; while the kind of blackout that the drinker comes out of while still drinking may be due to blockage of primary memory processing by the same mechanism in the

hippocampus during awakeness.

Further, if Winson's dream theory is correct, we have another instance of an attempt at self-cure through the use of alcohol not only failing, but making things worse. If some people drink because they have difficulty coping, and dreaming is an important coping mechanism through which current information is fixed in memory and integrated with past experience, excessive drinking disrupts and diminishes this process. The heavy drinker is depriving himself of an important coping response and a vicious cycle is set up. A fundamental resource for understanding self and world is lost, and the anxiety engenders by that loss may well set up the next drinking episode.

About the Author

Jerome D. Levin, Ph.D., has treated addictions for over thirty years. He is the author of eleven previous books and has taught at Suffolk Community College, Marymount Manhattan College, St. Joseph's College, and the New School for Social Research, where he directed a program to train addiction counselors for over twenty-five years. He practices psychotherapy in Manhattan and Suffolk County, New York. You can contact Dr. Levin at jeromedlevin@gmail.com or (212) 989-3976.

References

Abraham, K. (1979). The psychological relations between sexuality and alcoholism. In *Selected papers on psychoanalysis* (pp. 80-90). New York: Brunner/Mazel. (Original work published 1908)

Alcoholics Anonymous World Services. (1952). *Twelve steps and twelve traditions*. New York: Author.

Alcoholics Anonymous World Services. (1976). *Alcoholics anonymous* (3rd ed.). New York: Author.

Alexopoulos, G. S., Lieberman, K. W., & Frances, R. J. (1983). Platelet MOA activity in alcoholic patients and their first-degree relatives. *American Journal of Psychiatry, 140*(11), 1501-1503.

Amark, C. (1951). A study in alcoholism: Clinical, social, psychiatric, and genetic investigations. *Acta Psychiatrica Neurologica Scandinavica, 70*, 1-283.

American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed. rev.). Washington, DC: Author.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Babor, T. F., Wolfson, A., Boivan, D., Padouco-Thomas, S., & Clark, W. (1992). Alcoholism, culture, and psychopathology: A comparative study of French, French- Canadian, and American alcoholics. In J. E. Helzer & G. J. Canino (Eds.), *Alcoholism in North America, Europe, and Asia* (pp. 182-195). New York: Oxford University Press.

Bales, R. F. (1959). Cultural differences in rates of alcoholism. In G. McCarthy (Ed.), *Drinking and intoxication*. Glencoe, IL: Free Press.

Balint, M. (1968). *The basic fault*. London: Tavistock.

Bandura, A., & Walters, R. H. (1963). *Social learning and personality development.* New York: Holt, Rinehart & Winston.

Barnes, G. E. (1979). The alcoholic personality: A reanalysis of the literature. *Journal of Studies on Alcohol, 40*, 571-634.

Barnes, G. E. (1983). Clinical and prealcoholic personality characteristics, In B. Kissin & H. Begleiter (Eds.), *The biology of alcoholism, Vol. 6. The pathogenesis of alcoholism: Psychosocial factors* (pp. 113-196). New York: Plenum.

Bateson, G. (1971). The cybernetics of "self': A theory of alcoholism. *Psychiatry, 34*, 1-18.

Bateson, G., & Ruesch, J. (1951). *Communication: The social matrix of psychiatry*. New York: W. W. Norton.

Beck, A. T. (1976). *Cognitive therapy and the emotional disorders.* New York: International Universities Press.

Begleiter, H., Porjesz, B., Bihari, B., & Kissen, B. (1984). Event-related brain potentials in boys at risk for alcoholism. *Science, 225*, 1493-1495.

Bentham, J. (1939). An introduction to the principles of morals and legislation. In E. A. Burtt (Ed.), *The English Philosophers from Bacon to Mill* (pp. 791-852). New York: The Modem Library. (Original work published 1789)

Berglas, S. (1985). Self-handicapping and self-handicappers: A cognitive/attributional model of interpersonal self-protective behavior. In R. Hogan and W. H. Jones (Eds.), *Perspectives in*

personality theory: Theory, measurement and interpersonal dynamics. Greenwich, CT: JAI Press.

Blane, H. T. (1968). *The personality of the alcoholic: Guises of dependency.* New York: Harper & Row.

Bleuler, M. (1955). Familial and personal background of chronic alcoholics. In O. Drethelm (Ed.), *Etiology of chronic alcoholism* (pp. 110-166). Springfield, IL: Charles C. Thomas.

Bohman, M. (1978). Some genetic aspects of alcoholism and criminality: A population of adoptees. *Archives of General Psychiatry, 35*, 269-276.

Bradshaw, J. (1988). *Healing the shame that binds you*. Deerfield Beach, FL: Health Communications.

Bunzel, A. (1940). The role of alcoholism in two Central American cultures. *Psychiatry, 3*, 361-387.

Butzel, R. (1982). Intoxication and withdrawal. In N.J. Estes & M. E. Heinemann (Eds.), *Alcoholism: Developments, consequences, and interventions* (2nd ed., pp. 102-108). St. Louis: Mosby.

Cadoret, R. J., O'Gorman, T. W., Troughton, E., & Heywood, L. (1984). Alcoholism and antisocial personality: Interrelationshps, genetic and environmental factors. *Archives of General Psychiatry, 42*, 161-167.

Cahalan, D., Cisin, H., & Crossley, H. (1969). *American drinking practices: A national survey of behavior and attitudes* (Monograph 6). New Brunswick, NJ: Rutgers Center for Alcohol Studies.

Cappell, H. & Herman, C. P. (1972). Alcohol and tension reduction: A review, *Journal of Studies on Alcohol, 33*, 33-64.

Child, I, Bacon, M., & Barry, H. (1965). A cross-cultural study of drinking. *Quarterly Journal of Studies on Alcohol* (Suppl. 3), 5-96.

Clark, W. B. & Cahalan, D. (1976). Changes in problem drinking over a four-year span. *Addictive Behaviors, 1*, 251-259.

Clark, W. B., & Midanik, L. (1982). Alcohol use and alcohol problems among U.S. adults. Results of the 1979 national survey. In *Alcohol consumption and related problems* (Alcohol and Health Monograph No. 1, DHHS Publication No. ADM 82-1190). Washington, DC: U.S. Government Printing Office.

Cloninger, C. R. (1983). Genetic and environmental factors in the development of alcoholism. *Journal of Psychiatric Treatment and Evaluation, 5*, 487—496.

Cloninger, C. R. (1987a). A systematic method for clinical description and classification of personality variants: A proposal. *Archives of General Psychiatry, 44*, 573-588.

Cloninger, C. R. (1987b). Neurogenetic adaptive mechanisms in alcoholism. *Science, 236*, 410-416.

Cloninger, C. R., Bohman, M., & Sigvardsson, S. (1981). Cross-fostering analysis of adopted men. *Archives of General Psychiatry, 36*, 861-868.

Cloninger, C. R., Sigvardsson, S., & Bohman, M. (1988). Childhood personality predicts alcohol abuse in young adults. *Alcoholism: Clinical and Experimental Research, 12*, 494-505.

Conger, J. J. (1956). Reinforcement and the dynamics of alcoholism, *Quarterly Journal of Studies on Alcohol, 13*, 296-305.

Conner, R. (1962). The self-concepts of alcoholics. In D. Pittman & C. Snyder (Eds.), *Society, culture and drinking patterns* (pp. 455-467). Carbondale: Southern Illinois University Press.

Cox, W. M. (1985). Personality correlatives of substance abuse. In M. Galizio & S. A. Mausto (Eds.), *Determinants of substance abuse: Biological, psychological, and environmental factors* (pp. 209-246). New York: Plenum.

Cox, W. M. (1987). Personality theory and research. In H. Blane and K. Leonard (Eds.), *Psychological theories of drinking and alcoholism* (pp. 55-89). New York: Guilford Press.

Cruz-Coke, R., & Varela, A. (1966). Inheritance of alcoholism: Its association with colour-blindness. *Lancet, ii,* 1282-1284.

DeLuca, J., & Wallace, J. (1981). *The fourth special report to the U.S. Congress on alcohol and health* [DHHS Publication No. (ADM)81-1291], Washington, DC: U.S. Government Printing Office.

Deutsch, H. (1965). Some forms of emotional disturbance and their relationship to schizophrenia. In *Neuroses and character types* (pp. 262-281). New York: International Universities Press.

Durkheim, E. (1987). *Suicide.* Glencoe, IL: Free Press.

Ellis, A. (1962). *Reason and emotion in psychotherapy*. Seacaucus, NJ: Citadel.

Ellis, A. (1988). *Rational-emotive therapy with alcoholics and substance abusers*. Oxford: Pergamon Press.

Fenichel, O. (1945). *The psychoanalytic theory of the neurosis.* New York: W. W. Norton.

Field, P. (1962). A new cross-cultural study of drunkenness. In D. Pittman & C. Snyder (Eds.), *Society, culture, and drinking patterns* (pp. 48-74). Carbondale: Southern Illinois University Press.

Fingarette, H. (1988). *Heavy drinking: The myth of alcoholism as a disease*. Berkeley, CA: University of California Press.

Freud, S. (1953). Interpretation of dreams. In J. Strachey (Ed. and Trans.), Standard edition of the complete psychological works of Sigmund Freud (Vols. 4 & 5, pp. 1- 628). London: Hogarth Press (original work published 1900).

Freud, S. (1955). Beyond the pleasure principle. In J. Strachey (Ed. and Trans.), *Standard edition of the complete psychological works of Sigmund Freud* (Vol. 18, pp.1-64). London: Hogarth Press (original work published 1920).

Freud, S. (1956). The ego and the id. In J. Strachey (Ed. and Trans.), *Standard edition of the complete psychological works of Sigmund Freud* (Vol. 19, pp. 1-66). London: Hogarth Press (original work published 1923).

Freud, S. (1957). On narcissism: an introduction. In J. Strachey (Ed. and Trans.), *Standard edition of the complete psychological works of Sigmund Freud* (Vol. 14, pp. 67-104). London: Hogarth Press (original work published 1914).

Freud, S. (1961). Dostoevsky and parricide. In J. Strachey (Ed. and Trans.), *Standard edition of the complete psychological works of Sigmund Freud* (Vol. 21, pp. 173-194). London: Hogarth Press (original work published 1928).

Freud, S. (1974). *Cocaine papers* (B. Byck, Ed.). New York: New American Library.

Freud, S. (1985). *The complete letters of Sigmund Freud to Wilhelm Fleiss* (J. M. Mason, Ed. and Trans.) Cambridge, MA: Harvard University Press. (Originally written 1897).

Fromm, E. (1941). *Escape from freedom.* New York: Rinehart.

Fromm, E. (1964). *The heart of man.* New York: Harper & Row.

Galanter, M. (1993). *Network therapy for alcohol and drug abuse: A new*

approach in practice. New York: Basic Books.

Gay, P. (1988). *Freud: A life for our time.* New York: W. W. Norton.

Gilman, A. G., Goodman, L. S., & Gilman, A. (Eds.). (1985). *Goodman and Gilman's The pharmacological bases of therapeutics* (7th ed.). New York: Macmillan.

Glover, E. (1928). The etiology of alcoholism. *Proceedings of the Royal Society of Medicine, 21.* 1351-1355.

Goldstein, G. (1976). Perceptual and cognitive deficit in alcoholics. In G. Goldstein & C. Neuringer (Eds.), *Empirical studies of alcoholism* (pp. 115-152). Cambridge, MA: Bollinger.

Goodwin, D. W. (1988). *Is alcoholism hereditary?* New York: Ballantine Books.

Goodwin, D.W., Schulsinger, F., Hermansen, L., Guze, S. B., & Winokur, G. (1973). Alcohol problems in adoptees raised apart from alcoholic biological parents. *Archives of General Psychiatry, 28,* 283-343.

Hall, T. (1989, March 15). A new temperance is taking root in America. *The New York Times*, pp. Al, A6.

Harris, L., and Associates, Inc. (1971). *American attitudes toward alcohol and alcoholism* (Study no. 2188). A survey of public opinion prepared for the National Insti¬tute on Alcohol Abuse and Alcoholism. New York: Louis Harris.

Hartocollis, P., & Hartocollis, P. (1980). Alcoholism, borderline and narcissistic disorders: A psychoanalytic overview. In W. Fann, I. Karacon, A. Pokomy, & R. Williams (Eds.), *Phenomenology and treatment of alcoholism* (pp. 93-110). New York: Spectrum.

Hartocollis, P. (1968). A dynamic view of alcoholism: drinking in the service of denial. *Dynamic Psychiatry*, 2, 173-182.

Heath, D. B. (1958). Drinking patterns of the Bolivian Camba. *Quarterly Journal of Studies on Alcohol, 19*, 491-508.

Heath, D.B. (1991). Continuity and change in drinking patterns of the Bolivian Camba. In D. Pittman & H. A. White (Eds.), *Society, culture, and drinking patterns reexamined* (pp. 78-86). New Brunswick, NJ: Rutgers Center of Alcohol Studies.

Hewitt, C. C. (1943). A personality study of alcohol addiction. *Quarterly Journal of Studies on Alcohol, 4,* 368-386.

Horton, D. (1943). The functions of alcohol in primitive societies: A cross-cultural study. *Quarterly Journal of Studies on Alcohol, 4,* 199-320.

Hull, J. G. (1981). A self-awareness model of the causes and effects of alcohol consumption. *Journal of Abnormal Psychology, 90,* 586-600.

Huxley, A. (1954). *The doors of perception.* New York: Harper & Row.

Irgens-Jensen, O. (1971). *Problem drinking and personality: A study based on the Draw- a-Person Test.* New Brunswick, NJ: Rutgers Center for Alcohol Studies.

Jacobson, E. (1938). *Progressive relaxation.* Chicago: University of Chicago Press.

James, W. (1902). *Varieties of religious experience.* New York: Longmans.

Jellinek, E. M. (1952). Phases of alcohol addiction. *Quarterly Journal of Studies on Alcohol. 13*, 673-684.

Jellinek, E. M. (1960). *The disease concept of alcoholism.* New Haven, CT: College and University Press.

Jellinek, E. M. (1962). Cultural differences in the meaning of alcoholism. In D. J. Pittman and C. R. Snyder (Eds.), *Society, culture, and drinking*

patterns (pp. 382-388). Carbondale: Southern Illinois University Press.

Jellinek, G. (1994). Heredity and premature weaning: A discussion of the work of Thomas Trotter, British Naval Physician. In J. Levin & R. Weiss (Eds.), *The dynamics and treatment of alcoholism: Essential papers* (pp. 28-34). Northvale, NJ: Jason Aronson. (Trotter's original work published 1804, Jellinek's article, 1943)

Jessor, R. (1987). Problem-behavior theory, psychosocial development, and adolescent problem drinking. *British Journal of Addictions, 82*, 331-342.

Jessor, R., Graves, T. D., Hanson, R. C. & Jessor, S. L. (1968). *Society, personality, behavior: A study of a tri-ethnic community.* New York: Hold, Rinehart & Winston.

Jones, K. L., Smith, D. W., Ulleland, C. N., & Streissguth, A. P. (1973). Pattern of malformation in offspring in chronic alcoholic women. *Lancet, i*, 1267-1271.

Jones, M. C. (1968). Personal correlates of antecedents of drinking patterns in adult males, *Journal of Consulting and Clinical Psychology, 32,* 2-12.

Jones, M. C. (1971). Personality antecedents and correlates of drinking patterns in women, *Journal of Consulting and Clinical Psychology, 36,* 61-69.

Julien, R. M. (1991). *A primer of drug action* (6th ed.). San Francisco: W. H. Freeman.

Jung, C. G. (1973). In G. Adler (Ed.), *C.G. Jung: Letters, Vol. 11, 1951-1961* (pp. 623- 625). Princeton, NJ: Princeton University Press. (Originally written 1961)

Kaij, L. (1960). *Alcoholism in twins: Studies on the etiology and sequels of abuse of alcohol.* Stockholm: Almquist & Wiksell.

Kaminer, W. (1993). *I'm dysfunctional, you're dysfunctional: The recovery movement and other self-help fashions.* New York: Vintage.

Kandel, D. B. (1975). Stages in adolescent involvement in drug use. *Science, 190,* 912- 914.

Kandel, D. B., Yamaguchi, K., & Chen, K. (1992). Stages of progression in drug involvement from adolescence to adulthood: Further evidence for the gateway theory. *Journal of Studies on Alcohol, 53,* 447-457.

Kant, I. (1929). *The critique of pure reason* (2nd Ed., M. K. Smith, trans.). London: MacMillan. (Original work published 1787)

Kazin, A. (1976, March). 'The giant killer': Drink and the american writer. *Commentary, 61(3),* 44-50.

Keller, M. (1958). Alcoholism: Nature and extent of the problem. *Annals of the American Academy of Political and Social Science, 315,* 1-11.

Kernberg, O. (1975). *Borderline conditions and pathological narcissism.* New York: Jason Aronson.

Khantzian, E.J. (1981). Some treatment implications of ego and self-disturbances in alcoholism. In M. H. Bean & N. E. Zinberg (Eds.), *Dynamic approaches to the understanding and treatment of alcoholism* (pp. 163-188). New York: Free Press.

Kierkegaard, S. (1944). *The concept of dread* (W. Lowrie, Trans.). Princeton, NJ: Princeton University Press. (Original work published 1849)

Kirkpatrick, J. (1977). *Turnabout: Help for a new life.* New York: Doubleday.

Klausner, S. (1964). Sacred and profane meanings of blood and alcohol. *The Journal of Social Psychology, 64,* 27-43.

Knight, R. P. (1937). The dynamics and treatment of chronic alcohol addiction.

Bulletin of the Menninger Clinic, 1, 233-250.

Knight, R.P. (1938). The psychoanalytic treatment in a sanatarium of chronic addiction to alcohol. *Journal of the American Medical Association, 111,* 1443-1448.

Kohut, H. (1971). *The analysis of the self: A systematic approach to the psychoanalytic treatment of narcissistic personality disorders.* New York: International Universities Press.

Kohut, H. (1977a). *The restoration of the self.* New York: International Universities Press.

Kohut, H. (1977b). *Psychodynamics of drug dependence* (National Institute on Drug Abuse Monograph 12, pp. vii-ix). Washington, DC: U.S. Government Printing Office.

Krystal, H., & Raskin, H. (1970). *Drug dependence: Aspects of ego function.* Detroit: Wayne State University Press.

Levin, J.D. (1981). A study of social role conflict in chronic alcoholic men afflicted with Alcoholics Anonymous (Doctoral dissertation, New York University, 1981). *Dissertation Abstracts International, 42-12B* 4970. (University Microfilms No. 8210924)

Levin, J.D. (1987). *Treatment of alcoholism and other addictions: A self-psychology approach.* Northvale, NJ: Jason Aronson.

Levin, J.D. (1991). *Recovery from alcoholism: Beyond your wildest dreams.* Northvale, NJ: Jason Aronson.

Levin, J.D. (1993). *Slings and arrows: narcissistic injury and its treatment.* Northvale, NJ: Jason Aronson.

Levin, J.D. & Weiss, R. H. (Eds.) (1994). *The dynamics and treatment of alcoholism: Essential papers.* Northvale, NJ: Jason Aronson.

Lex, B. (1985). Alcohol problems in special populations. In J.H. Mendelson & N. K. Mello (Eds.), *The diagnosis and treatment of alcoholism* (2nd ed., pp. 89-188). New York: McGraw-Hill.

Lipscomb, T. R., Carpenter, J. A., & Nathan, P. E. (1980). Static ataxia: A predictor of alcoholism? *British Journal of Addictions, 74,* 289-294.

London, W. P. (1990). Left-handedness and alcoholism. In S. Coren (Ed.), *Left-handed-ness: Behavioral implications and anomalies,* pp. 457-484. New York: Elsevier Science.

Loper, R. G., Kammeier, M. L., & Hoffman, H. (1973). MMPI characteristics of college freshmen males who later became alcoholics. *Journal of Abnormal Psychology, 82,* 159-162.

MacAndrew, C. (1965). The differentiation of male alcoholic outpatients from nonalcoholic psychiatric outpatients by means of the MMPI. *Quarterly Journal of Studies on Alcohol, 26,* 238-246.

MacAndrew, C. & Edgerton, R. B. (1969). *Drunken comportment.* Chicago: Aldine.

MacAndrew, C., & Geertsma, R.H. (1963). Analysis of responses of alcoholics to Scale 4 of the MMPI. *Quarterly Journal of Studies on Alcohol, 26,* 23-38.

Maccoby, M. (1977). Alcoholism in a Mexican village. In McClelland, D., Davis, W. N., Kalin, R., & Wanner, E. (Eds.). *The drinking man,* pp. 232-260. New York: Free Press.

Mahler, M., Pine F., & Bergman, A. (1975). *>The psychological birth of the human infant: Symbiosis and individuation.* New York: Basic Books.

Marlatt, G. A. & Gordon, J. R. (1985). *Relapse prevention: Maintenance strategies in the treatment of addictive behaviors.* New York: Guilford Press.

Masserman, J., & Yum, K. (1946). An analysis of the influence of alcohol in experimental neurosis in cats. *Psychosomatic Medicine, 8,* 36-52.

Masters, W. H., & Johnson, V. E. (1970). *Human sexual inadequacy.* Boston: Little, Brown.

McClelland, D. C., Davis, W., Kalin, R., & Wanner, E. (1972). *The drinking man: Alcohol and human motivation.* New York: Free Press.

McCord, W., & McCord, J., with Gudeman, J. (1960). *Origins of Alcoholism.* Stanford, CA: Stanford University Press.

McCord, W., & McCord, J. (1962). A longitudinal study of the personality of alcoholics. In D. J. Pittman and C. R. Synder (Eds.), *Society, culture and drinking patterns* (pp. 413-430). Carbondale, Ill.: Southern Illinois University Press.

Mello, N.K., & Mendelson, J.H. (1970). Experimentally induced intoxication in alcoholics: A comparison between programmed and spontaneous drinking. *Journal of Pharmacology and Experimental Therapeutics, 173,* 101-116.

Mello, N. K. & Mendelson, J. H. (1972). Drinking patterns during work-contingent and noncontingent alcohol acquisition. *Psychosomatic Medicine, 34,* 139-164.

Menninger, K. (1938). *Man against himself.* New York: Harcourt Brace.

Meyerson, A. (1940). Alcohol: A study of social ambivalence. *Quarterly Journal of Studies on Alcohol, I,* 13-20.

Murray, H. A. (1938). *Explorations in personality.* New York: Oxford University Press.

National Institute on Alcohol Abuse and Alcoholism (1983). *Fifth special report to the U.S. Congress on Alcohol and Health from the Secretary*

of Health and Human Services (DHHS Publication No. 84-1291).Rockville, MD: Author.

National Institute on Alcohol Abuse and Alcoholism (NIAAA) (1988). *Sixth special report to the U.S. Congress on alcohol and health from the Secretary of Health and Human Services* (DHHS Publication No. 85-0009).Rockville, MD: Author.

National Institute on Alcohol Abuse and Alcoholism. (1990). *Seventh Special Report to the U.S. Congress on Alcohol and Health from the Secretary of Health and Human Services* (DHHS Publication No. 90-1656). Rockville, MD: Author.

National Institute of Alcohol Abuse and Alcoholism (1994). *Eighth special report to the U.S. Congress on alcohol and health from the Secretary of Health and Human Services* (NIH Publication No. 94-3699). Rockville, MD: Author.

Park, P. (1973). Developmental ordering of experiences in alcoholism. *Quarterly Journal of Studies on Alcohol, 34,* 473-488.

Pavlov, I. (1927). *Conditioned reflexes.* Oxford, England: Oxford University Press.

Peninston, E. G. & Kulkosky, P. J. (1989). Brainwave training and B-endorphin levels in alcoholics. *>Alcoholism: Clinical and Experimental Research, 13,* 271-279.

Peninston, E. G., & Kulkosky, P. J. (1990). Alcoholic personality and alpha-theta brainwave training. *Medical Psychotherapy, 3,* 37-55.

Petrie, A. (1978). *Individuality in pain and suffering* (2nd ed.). Chicago: University of Chicago Press.

Pitts, F. N., Jr., & Winokur, G. (1966). Affective disorder—VII: Alcoholism and affective disorder. *Journal of Psychiatric Research, 4,* 37-50.

Polich, J., Armor, D., & Brainer, H. (1981). *The course of alcoholism.* New York: Wiley.

Polich, J., & Bloom, F. E. (1987). P300 from normals and adult children of alcoholics. *Alcohol, 4,* 301-307.

Pollock, V. E., Volavka, J., Goodwin, D. W., Mednick, S. A., Gabrielli, W. F., Knop, J., & Schulsinger, F. (1983). The EEG after alcohol administration in men at risk of alcoholism. *Archives of General Psychiatry, 40,* 857-861.

Porjesz, B., & Begleiter, H. (Eds.). (1983). *The biology of alcoholism, vol. VII: The pathogenesis of alcoholism, biological factors* (pp. 415-483). New York: Plenum Press.

Prochaska, J., & DiClemente, C. C. (1984). *The transtheoretical approach: Crossing the traditional boundaries of therapy.* Homewood, IL: Dow-Jones/Irwin.

Prochaska, J. V., DiClemente, C. C., & Norcross, J. C. (1992). In search of how people change: Applications to addictive behaviors. *American Psychologist, 47,* 1102-1114.

Propping, P., Kruger, J., & Mark, N. (1981). Genetic disposition to alcoholism: An EEG study in alcoholics and their relatives. *Human Genetics, 35,* 51-59.

Rado, S. (1933). The psychoanalysis of pharmacothymia. *Psychoanalytic Quarterly, 2,* 2-23.

Richards, H. J. (1993). *Therapy of the substance abuse syndromes.* Northvale, NJ: Jason Aronson.

Robbins, L. N., Bates, W. N., & O'Neal, P. (1962). Adult drinking patterns of former problem children. In D. J. Pittman & C. R. Snyder (Eds.), *Society, culture and drinking patterns* (pp. 395-412). Carbondale: Southern Illinois University Press.

Robbins, L. R., & Smith, E. M. (1980). Longitudinal studies of alcohol and drug problems: sex differences. In O. J. Kalant (Ed.), *Alcohol and drug problems in women.* New York: Plenum Press.

Roe, A. (1945). The adult adjustment of children of alcoholic parents raised in foster homes. *Quarterly Journal of Studies on Alcohol, 5,* 378-393.

Rohsenow, D. J. (1983). Alcoholics' perceptions of control. In W. M. Cox (Ed.), *Identifying and measuring alcoholic personality characteristics* (pp. 37-48). San Francisco: Jossey-Bass.

Rooney, J. F. (1991). Patterns of alcohol use in Spanish society. In. D. Pittman & H. R. White (Eds.), *Society, culture, and drinking patterns reexamined* (pp. 78-86). New Brunswick, NJ: Rutgers Center of Alcohol Studies.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80.*

Rush, B. (1994). An inquiry into the effects of ardent spirits upon the human body and mind. In J. Levin & R. Weiss (Eds.), *The dynamics and treatment of alcoholism: Essential papers* (pp. 11-27). Northvale, NJ: Jason Aronson. (Original work published 1785)

Sandor, S. (1968). The influence of ethyl alcohol on the development of the chick embryo.*Revue du-Embryologie et de-Cytologie, Serie Embryologie, 5,* 51-76.

Schuckit, M. A., & Gold, F. O. (1988). A simultaneous evaluation of multiple markers of ethanol/placebo challenges in sons of alcoholics and controls. *Archives of General Psychiatry, 45,* 211-216.

Shaffer, H. J. (1992). The psychology of stage change: The transition from addiction to recovery. In J. H. Lowinson, P. Ruiz, & R. B. Millman (Eds.), *Comprehensive textbook of substance abuse* (2nd ed., pp. 100-105). Baltimore: Williams & Wilkins.

Shaffer, H. J. (1994). Denial, ambivalence, and countertransferential hate. In J. D. Levin & R. H. Weiss (Eds.), *The dynamics and treatment of alcoholism: Essential papers,* pp. 421-437. Northvale, NJ: Jason Aronson.

Sher, K. J. (1987). Stress response dampening. In H. T. Blane & K. E. Leonard (Eds.), *Psychological theories of drinking and alcoholism* (pp. 227-271). New York: Guilford Press.

Shipley, T. E., Jr. (1982). Alcohol withdrawal and its treatment: Some conjectures in the context of the opponent-process theory. *Journal of Studies on Alcohol, 43,* 548-569.

Simmel, E. (1948). Alcoholism and addiction. *Psychoanalytic Quarterly, 17,* 6-31.

Skinner, B. F. (1938). *The behavior of organisms.* New York: Appleton-Century-Crofts.

Smith, M. O. (1989). *The Lincoln Hospital acupuncture drug treatment program.* Testimony presented to the Select Committee on Narcotics of the U.S. House of Representatives, July 25, 1989.

Sobell, M. B. & Sobell, L. C. (1978). *Behavioral treatment of alcohol problems: Individualized therapy and controlled drinking.* New York: Plenum Press.

Sobell, M. B., & Sobell, L. C. (1993). *Problem drinkers: Guided self-change treatment.* New York: Guilford Press.

Solomon, R. L. (1977). An opponent process theory of acquired motivation: The affective dynamics of addiction. In J. D. Maser & M.E.P. Seligman (Eds.), *Psychopathology: Experimental Models* (pp. 66-103). San Francisco: W. H. Freeman.

Spitz, H. I., & Rosecan, J. S. (1987). *Cocaine abuse.* New York: Brunner/Mazel.

Szasz, T. (1958). The role of the counterphobic mechanism in addiction. *Journal of the American Psychoanalytic Association, 6,* 309-325.

Tabakoff, B., Hoffman, P. L., Lee, J. M., Saito, T., Willard, B., & Deleon-Jones, F. (1988). Differences in platelet enzyme activity between alcoholics and nonalcoholics. *New England Journal of Medicine, 318,* 134-139.

Tarter, R. E. (1981). Minimal brain dysfunction as an etiological disposition to alcoholism. In R. E. Meyer (Eds.), *Evaluation of the alcoholic: Implications for research, theory, and treatment* (NIAAA Monograph Series). Washington, DC: National Institute on Alcohol Abuse and Alcoholism.

Tarter, R. E. & Alterman, A. I. (1989). Neurobehavioral theory of alcoholism etiology. In C. D. Choudron & D. A. Wilkinson (Eds.), *Theories of alcoholism.* Toronto: Addiction Research Foundation.

Tillich, P. (1952). *The courage to be.* New Haven, CT: Yale University Press.

Trimpey, J. (1989). *Rational recovery from alcoholism: The small book* (3rd ed.). Lotus, CA: Lotus Press.

Vaillant, G. E. (1983). *The natural history of alcoholism: Causes, patterns and paths to recovery.* Cambridge, MA: Harvard University Press.

Varela, A., Rivera, L., Mardones, J., & Cruz-Coke, R. (1969). Color vision defects in non-alcoholic relatives of alcoholic patients. *British Journal of the Addictions, 64,*67-71.

von Knorring, A. L., Bohman, M., von Knorring, L., & Oreland, L. (1985). Platelet MAO activity as a biological marker in subgroups of alcoholism. *>Acta Psychiatrica Scandinavica, 72,* 51-58.

Williams, G. D. & DeBakey, S. F. (1992). Changes in levels of alcohol consumption: United States 1983 to 1988. *British Journal of Addictions, 87 (4),* 643-648.

Wilsnack, S. C. (1973). Sex role identity in female alcoholism. *Journal of Abnormal Psychology, 82,* 253-261.

Wilsnack, S. C. (1984).Drinking, sexuality, and sexual dysfunction in women. In S. C. Wilsnack & L. J. Beckman (Eds.), *Alcohol problems in women: Antecedents, consequences, and interventions,* pp. 189-228. New York: Guilford Press.

Wilsnack, S. C. & Beckman, L. J. (Eds.) (1984). *Alcohol problems in women: Antecedents, consequences, and intervention.* >New York: Guilford Press.

Wilsnack, S.C. (1991). Sexuality and women's drinking: Findings from a U.S. national study. *Alcohol and Health Research World, 15(2),* 147-150.

Wilson, G., & Lawson, D. (1978). Expectancies, alcohol, and sexual arousal in women. *Abnormal Psychology, 85,* 358-367.

Winnicott, D. W. (1958). The capacity to be alone. In *The maturational processes and the facilitating environment* (pp. 29-36). New York: International Universities Press, 1965.

Winnicott, D. W. (1960). Ego distortion in terms of true and false self. In *The maturational processes and the facilitating environment* (pp. 140-152). New York: International Universities Press, 1965.

Winokur, G. (1974). The division of depressive illness into depressive-spectrum disease and pure depressive disease. *International Pharmaco-psychiatry, 9,* 5-13.

Winokur, G., Rimmer, J., & Reich, T. (1971). Alcoholism IV: Is there more than one type of alcoholism? *British Journal of Psychiatry, 18,* 525-531.

Winson, J. (1985). *Brain and Psyche: The Biology of the Unconscious.* New York: Anchor Press, Doubleday.

Winson, J. (1990). The Meaning of Dreams. *Scientific American,* November 1990. 86-96.

Wise, R. A. (1987). Psychomotor stimulant properties of addictive drugs. *Pharmacological Therapy, 35,* 227-263.

Witkin, H. A., & Oltman, P. K. (1967). Cognitive style. *International Journal of Neurology, 6,* 119-137.

Witkin, H. A., Karp, S. A., & Goodenough, D. R. (1959). Dependence in alcoholics. *Quarterly Journal of Studies on Alcohol, 20,* 493-504.

Wurmser, L. (1978). *The hidden dimension: Psychodynamics in compulsive drug use.* New York: Jason Aronson.

Zucker, R. A. & Gomberg, E. S. L. (1986). >Etiology of alcoholism reconsidered: The case for a biopsychosocial process. *American Psychologist, 41,* 783-793.

Zuckerman, M. (1979). *Sensation seeking: Beyond the optimal level of arousal.* New York: Wiley.