Making Addiction a Brain Disease: A Social History of Addiction Neuroscience

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Jerome H. Jaffe

... I have fought this issue of "relapsing brain" disorder" since somebody decided that this is the current mantra. The model of dependence that we favor is a complex interplay between environment and what may very well be a longlasting sense of greater sensitivity to drugrelated stimuli. Obviously, to the extent that aspects of drug dependence involve learning and changed responsivity to stimuli there are changes in the brain....

The Opium Problem (1928)



Death in morphin [sic] poisoning is a brain death.

The central nervous system is the most severely affected in morphin poisoning. The alterations in this, because of their intensity and regular occurrence, are in the foreground of the pathologico-anatomic picture of poisoning.... Death in morphin [sic] poisoning is a brain death. In the most acute form of poisoning, distinct brain alterations are already apparent a matter of a chronic brain process, which had been going on for some time, overlaid by acute alterations." W. Weimann, Zur pathologischen Anatomie der akuten und chronischen Morphiumvergiftung, Medezin 1926, v. 8, pp. 205-220; translated and quoted in Terry and Pellens, p. 290.

His brain has become addicted, but not his liver

The medical interest lies in the fact of the man accustomed to a poison becoming sick. He is sick because the poison taken habitually, while it fixes certain cells and confers on them increased activity or passivity, also renders these or other cells unserviceable for other functions, non-resistant to other influences.... His brain has become addicted, but not his liver. The morphinist has acquired high tolerance in certain regions of the brain.

E. Joel, Zur Pathologie der Gewohnung, Therap. Gegenwart 1923, v. 64, p. 397-

403, 441-447; quoted in Terry and Pellens, 384.







should be a narcotic-cure farm in every state of the Union. It is a deplorable fact that ONLY A FEW of the states

Narcotic Law should be compelled by local public opinion. Failure to adopt the measure will be inexcusable.





Committee on Drug Addiction (CDA)

- 1. scientific investigation of narcotics and analysis of chemical & biological literature on addiction alkaloids;
- 2. formulation of rules and regulations for legitimate use of alkaloids having addiction properties;
- 3. education of physicians and public;
- 4. "replacement of all present use of addiction alkaloids by *substitutes* having no addiction properties"

William C. White, CDA chair, 1929-1947

"Since no one drug can function for all of these uses, it is necessary to replace the legitimate uses of morphine with a number of substitutes.

. . .

[This] should render morphine an unnecessary commodity in international commerce."



PRE-WORLD WAR II 1930s

- Charted Morphine Abstinence Syndrome
- Showed patent medicine "cures" ineffective
- Determined addicts were not less intelligent than non-addicts
- Showed body shape and size (morphology) irrelevant
- Developed methods to track physiological tolerance, severity of dependence, and intensity of withdrawal

First Generation

Biophysicist Howard L. Andrews; Ralph Brown Robert H. Felix (founding director of NIMH) Justin K. Fuller (former CMO Ft. Leavenworth) Michael Pescor; Biochemist Fred W. Oberst Surgeon William F. Ossenfort (later CMO **Atlanta Penitentiary**) **Clinical Psychiatrist Victor H. Vogel** Physiologist Edwin G. Williams



Second Generation

- Harris Isbell succeeded Himmelsbach as research director in 1945
- Chemist Anna J. Eisenman, among first women to graduate from Yale University
- Biophysicist Karl Frank; H. Franklin (Frank) Fraser; Harris Hill; Conan Kornetsky; Richard Belleville in psychometrics
- Abraham Wikler

Abraham Wikler



Modal addict, 1935 White male, age 45 or older, casual labor or unemployed, "drifter"





Section on Analgesics, National Institute of Arthritis and Metabolic Diseases, c. 1958 Standing I. to r: J. H. Ager, J. G. Murphy, E. L. May, N. B. Eddy, L. J. Sargent and E. M. Fry Seated I to r: T. D. Perrine, E. L. Atwell, W. Ness, F. Gilliam and J. Cochin



Harris Isbell



Harry J. Anslinger, FBN Chief

An egotist will enjoy delusions of grandeur, the timid individual will suffer anxiety, and the aggressive one will resort to acts of violence and crime. Dormant tendencies are released and while the subject may know what is happening, he has become powerless to prevent it.... The drug has a corroding effect on the body and on the mind, weakening the entire physical system and often leading to insanity after prolonged use.

POST-WORLD WAR II Late 1940s/early 1950s • Discovered methadone effective for detox...but 'postaddicts' liked it too much

- Calculated methadone dosage for medically assisted detox on clinical side
- Demonstrated barbiturates addictive and withdrawal life-threatening
- Warned barbiturate users not to operate heavy machinery
- Showed 'delirium tremens' (d.t.s) were signs of alcohol withdrawal

POST-WORLD WAR II 1950s

- Reversed opiate overdose with nalorphine
- Developed criteria, reliable methods to predict abuse liability of new compounds
- Studied role of conditioning in relapse, and relapse after long drug-free periods
- Advanced "drug dependence" as term to destigmatize "addiction"

The Relation of Psychiatry to Pharmacology

"augmentation of a tendency to respond invariably under varying environmental conditions in accordance with those reaction patterns which are most 'stable' for the individual" (Wikler 1957, 246).

Seymour Kety

"[I]t is the human brain, which is heir to disorders that one cannot produce in lower animals like schizophrenia and other mental illnesses, it is the human brain that experiences profound sorrow, laughter, jests, incites, and it's the human brain that can speak and reveal its' inner workings to some extent." (ACNP Oral History Interview with Seymour Kety, p. 4)

NIH Clinical Research Center

The New York Times.

Facsimile of New York Times article, July 3, 1953

July 3, 1953

Revolutionary Center for Medical Research Dedicated



View during opening ceremonies at the fourteen-story Clinical Center Building, which was dedicated yesterday in suburban Bethesda, Md. Other buildings are in the foreground. it will contain all modern atomic energy means of treating patients as well as laboratories to prepare medications containing radioisotopes. An unusual feature of the radiation wing is the provision of rooms for patients, making possible supervised control of radioisotopes for diagnosis and treatment.

Dr. Sebrell emphasized that psychological and spiritual factors in the treatment of patients suffering from often-incurable long-term diseases had received their place in the Clinical Center. This phase even included the calling in of color experts to supervise the entire decoration.

On the top floor, where the operating rooms are finished in soft green tile, is a huge gymnasium-like room that will be used for the type of physical rehabilitation pioneered by Dr. Howard A. Rusk, director of the Institute of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center, and associate editor of THE NEW YORK TIMES.

There also is a dignified chapel, with a revolving stage presenting in turn the altars of the Protestant, Catholic, and Jewish faiths. It will always be open for meditation.

Each Floor Has Sunroom

Medical and psychiatric social work and recreational therapy will be carried out through the wards. A central sunroom on each floor will serve as a gathering place for ambulatory patients.

More than ninety doctors are now on the staff of the seven



POST-WORLD WAR II 1960s – 1970s

- Developed Addiction Research Center Inventory (ARCI) to classify drugs
- Provided first pharmacologic evidence of existence of multiple opiate receptors
- Pioneering studies of buprenorphine as treatment for opiate addiction





Tsung-ping Su

The glory of Lexington was that from a description of human pathology could come a pharmacological hypothesis. Lexington was a network of researchers asking very basic questions all the time, totally protected from political factors in ways that allowed us to be free to explore anything. That period has influenced me . . . to link the molecular to the global picture of the addictive process.



Addiction Research Center findings

- Narcotic antagonists can reverse overdose
- Dangers of barbiturates, warning labels
- Methadone can assist detoxification
- Conditioning to social and environmental cues plays role in relapse
- Some changes in addicts persist after drug exposure
- Addiction Research Center Inventory (ARCI)



NIDA Old Behavioral & New Neuro Buildings



The Decade Of The Brain 1990 - 2000

NEW YORK TIMES BESTSELLER

WILLIAM COPE MOYERS WITH KATHERINE KETCHAM



"Wittiam Cope Moyers's lucid, measured tale of his own plunge into crack addled hell [is] frightening in its very realism." --USA Today





Research has taught us that addiction is a complex disease, influenced by a multitude of highly entangled factors, with genetic, behavioral, environmental, and developmental factors all contributing.

William Dewey, Letter to Friends of NIDA, 2008

Evelyn Fox Keller, Secrets of Life, Secrets of Death, 398)

"All these differences seem to reveal a space indicating the operation of choice in the construction of scientific knowledge. Yet the moment we attempt to juxtapose the representational plasticity of scientific theories with their instrumental efficacy, this space seems to disappear before our eyes, leaving in its place an aura of inevitability."

Glantz and Pickens, 1992

"Drug abuse is a far more complex phenomenon than previously thought, and it is now recognized that drug abusers represent a highly heterogeneous group, and the patterns leading to dependence are diverse...."

[W]hat are called "behavioral effects" are not isolated, elementary changes in "consciousness," "perception," "emotion," "ideation," or "learning," which are simply increased or decreased by "stimulants" or "depressants," but complex patterns of change, proceeding in time, ... and dependent not only on the drug administered, but also on biographical and environmental factors as well as on the activities of the observer. . . . (Wikler 1957).