

## TRANSFORMATIONS

“That’s a hypercard. I thought you said Snow Crash was a drug,” Hiro says, now totally nonplussed.  
‘It is,’ the guy says. ‘Try it.’  
‘Does it fuck up your brain?’ Hiro says. ‘Or your computer?’  
‘Both. Neither. What’s the difference?’”

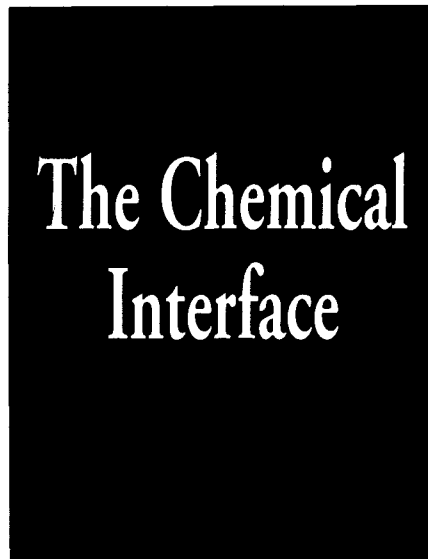
(Neal Stephenson, *Snow Crash*)

“You see control can never be a means to any practical end... It can never be a means to anything but more control... Like junk....”

(William Burroughs, *The Naked Lunch*)

The cyborg has many stories, histories, and prehistories. But for all of their scope and diversity, most of these accounts have ignored one of the cyborg’s earliest and most definitive features: its dependence on drugs. Before it was anything else, the cyborg was a junkie.

First named in a 1960 article by Clynes and Kline called “Drugs, Space and Cybernetics,” this early cybernetic organism emerged in the course of discussions about the biochemical, physiological, and electronic functioning of the human organism and the modifications which might facilitate its life in alien or extraterrestrial environments. [1] The cyborg was to be equipped with a prosthetic device, a sophisticated syringe known as the osmotic pressure pump capsule, and designed for “continuous slow injections of biochemically active substances at a biological rate.” Defining the cyborg as an entity which “deliberately incorporates exogenous components extending the self-regulatory control function of the organism,” Clynes and Kline explored the outer limits of human modification, and discussed their work on “a new preparation which may greatly enhance hypnotizability so that



pharmacological and hypnotic approaches may be symbiotically combined.” Their work dealt with the pharmacological possibilities of adjusting the organism’s metabolism, its ability to process food and fluids, its enzyme system, vestibular function, cardiovascular control, muscular maintenance, and perceptual abilities. It referred to ways of moderating sleep and wakefulness “through the use of that group of drugs known as psychic energizers, with adjunctive medication” already in use, and listed the challenges posed by variations in pressure and temperature, radiation, magnetic fields, and gravitational force, as well as discussing ways of combating the psychoses and relieving the “sensory invariance and action deprivation” which might await the traveller in space, and considering techniques for inducing unconsciousness, or limbo states, in times of dire emergency or pain.

Clynes and Kline’s cyborg has a history of drug use which extends through its military, medical and industrial pasts. Drugs lace its genealogies. The osmotic pressure pump with its permanent syringe, made their

cyborg the exemplary case of an organism indissoluble from its drugs, the addict taken to a new extreme. But when Clynes and Kline’s paper was recently republished, ‘drugs’ were dropped from its title. The article is now titled “Cyborgs and Space.” This change of name is indicative of the extent to which drugs have slipped out of mainstream discussions of the cyborg. They have, of course, been explored in some cyberpunk fictions, not least of all in Richard Kadrey’s *Metrophage*, Neal Stephenson’s *Snow Crash*, and much of William Gibson’s work. But while the role of artificial organs and other more spectacular prostheses has been amplified in the recent wave of discussions on the cyborg theme, the chemical interface has been conspicuous only by its absence.

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This neglect is only theoretical, of course. In practice, recent decades of medical and military practice and unauthorized street use have produced such a proliferation of drugs, users, and techniques of ingestion, that the chemical interface now constitutes one of the most sophisticated, widely explored and intimate of all the technical changes which can be made to the human. The drug-induced cyborg scrambles boundaries with far more insistence than its drug-free equivalents, providing one of the most fertile zones in which to trace the emergence of the cyborg and to explore the collapse of older distinctions between human and machine, nature and artifice, the intimate and the alien, the inside and the outside of bodies. As killers of pain and infection, drugs are also crucial to the success of the prostheses and transplants with which the cyborg is more usually associated. Operations without anesthetics had been as

imprecise as they were painful, and it was not until Joseph Priestly's late eighteenth century discovery of nitrous oxide that surgical techniques could be perfected on patients insensitive to the knife. Nitrous oxide was followed by ether, chloroform and, in 1805, the derivation of morphine from opium. The first anaesthetized operation was performed in 1846 to headlines which read: "HAIL HAPPY HOUR! WE HAVE CONQUERED PAIN!"

Drugs have also operated with the singular intimacy of substances coursing through the bloodstream, exercising direct effects on the very infrastructure of the body which other technologies are only now beginning to approach. One of the clearest implications of Clynes and Kline's research was that even the most unadulterated and sober organism is an already self-regulating biochemical machine, an open system predisposed to synthesizing, and interacting with, a wide variety of substances. This was a body whose self-regulating biochemical controls were not so much new, as newly exposed by its reconfiguration for survival in space. Its drugs were alien substances for use in alien environments but, at the same time, they were nothing more than quantitative extensions of the body's "natural" communications and defense systems. By virtue of their simple effectivity, drugs inform the body of its status as a finely tuned and malleable chemical machine whose reality is, at least to some extent, composed of a chemically-influenced set of perceptions and conceptions. As substances which mimic and connect with the action of those synthesized by the body itself, they made it impossible to say where human ended and cyborg began.

Many lines of high-level drugs research were pursued in the 1960s. But a series of psychedelic scandals in the sciences, the military, and the intelligence services provoked rumors of

a war on drugs and a clamp-down on research into several psychoactive substances by the end of the decade. Since then, with the exception of a few highly specialized or even classified programs of research, this war has muted and distorted all debate, research and experiment on drugs. Waged in an effort to regulate the chemical composition of individuals and populations, the war on drugs demands the control of all aspects of their research and development as well as their production, distribution and use. And while only a few of the substances discussed by Clynes and Kline have been directly at issue in the so-called war on drugs, prohibition has prejudiced even speculative research such as theirs.

By 1960, the chemical cyborg had many precedents. Medical research had pushed experiments on the chemical composition of the human organism to unprecedented extremes. A generation of women had been thrown into dependency on the first wave of tranquilizing substances; psychiatric patients had been treated with a wide variety of under-researched anti-psychotic drugs. But the most direct antecedents of Clynes and Kline's cyborg on drugs were the products of military experiment. Generations of soldiers, sailors and pilots had been supplied, sometimes unwittingly, with stimulants, depressants, and hallucinogens in an attempt to train even their internal chemistries to adapt to what would otherwise be untenable conditions and environments.

Such military uses of drugs have an ancient history. The Spanish conquistadors faced peoples who chewed coca to sustain themselves on long treks through high altitudes, and were thought to use peyote as a means of telecommunication. In the American Civil War, opium was given to soldiers orally in pill and tincture form, and morphine was dusted into wounds. And

with the development of the hypodermic syringe - the most immediate precursor to Clynes and Kline's osmotic pressure pump - in 1857, all this could be directly injected as well. The syringe was a military device which, like a gun, was to be used for shooting up, and also a prosthetic organ, a device added onto the body's existing means of ingesting substances. Freud's early experiments with cocaine were in part inspired by Aschenbrandt's use of cocaine with the Bavarian army. Opiates were widely used where the poppies now flower in the killing fields of the First World War and, in the Second World War, German troops used Methedrine, a brand of speed, to eliminate fatigue and maintain physical endurance. Coinciding with the emergence of cybernetics, neurochemistry, and a new interest in both human and machine intelligence, the 1940s synthesis of LSD amplified military interest in drugs. Operating in the new anti-Communist climate of the cold war, the CIA and the US military experimented with LSD and analogous hallucinogens with the same enthusiasm it applied to the production and distribution of drugs such as heroin and, later, cocaine. MKULTRA, a CIA program begun in the 1950s, explored the possibilities of using drugs such as LSD and other forms of manipulation to increase perceptual and conceptual skills, enhance hypnosis, protect against torture, alter personalities, influence thoughts, debilitate ambition and efficiency, and produce amnesia, confusion and even states of euphoria. The Vietnam War has been described as "a decisive point of intersection between pharmacology and the technology of violence." Chasing the dragon in slow-action replays, firing through a smoke screen of local weed, and playing the unwitting lab-rat in psychedelic experiments, "America's conscript army were 'wasted,' ('blitzed,' 'bombed out') on heroin, marijuana and LSD." [2]

The cyborg imagined by Clynes and Kline emerges from these intimate connections between medicine and military machines. In both their military and medical contexts, drugs effectively work as arms, weapons used to defend, augment, attack or otherwise manipulate the structure and function of the organism. [3] As medicines, they combat pain, infection and instability; in other capacities, they can heighten perception, increase endurance and, as in Clynes and Kline's case, completely reconfigure the organism to allow it to deal with any modifications to itself or its environment. The military drugs of the late twentieth century allow pilots to fuse with their planes, gunners to melt into their guns, and astronauts to synchronize with their ships. Next scene: obscene. "The presentation of the images from aerial combat will be projected directly into the pilot's eyeballs with the aid of a helmet fitted with optic fibers. This phenomenon of hallucination approaches that of drugs," as Paul Virilio writes. [4] This dream of an intimate technology jacked directly into the brain is only one of several ways in which drugs and other intimate technologies are now beginning to converge, in ways only hinted at by Clynes and Kline.

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All weapons are ambivalent. Substances sanctioned as medicines can be used to quite contradictory ends in both human individuals and cultures. If the war on drugs now struggles to gain control of the circulation of those substances circumscribed by international law, the modern, sanctioned use of drugs is only the tip of the iceberg of drug use which slides beneath the sober surfaces of modern culture.

As soon as its old church authorities and new medical institutions had begun to control the use of its home-grown medicines, Europe encountered a new wave of drugs with

enchantments of their own. Tobacco, hashish, opium and coca brought unprecedented benefits and problems to the Western world. In nineteenth-century England, the opiates were cheap, plentiful and without prejudice. They were used by workers, poets and everyone between: sick and healthy children alike were dosed on "Godfrey's Cordial" and a variety of other preparations containing opium. Laudanum was to be found in the majority of working class cupboards and, writing in the early 1820s, Thomas De Quincey was assured that in London "the number of amateur opium-eaters (as I may term them) was, at this time, immense." In Manchester, he was "informed by several cotton-manufacturers, that their work-people were rapidly getting into the practice of opium-eating; so much so, that on a Saturday afternoon the counters of the druggists were strewn with one, two, or three grains, in preparation for the known demand of the evening." [5] The cyborg-on-drugs is a throwback to opiated workers in the factory or the mill, hooked into the system, geared up for production, caught up in cycles of supply and demand.

Unlike their speedier heirs, the opiates functioned as fixatives and safety-valves, travel-sickness pills necessitated by the "eternal hurry" of the times, pain-killers demanded by the "colossal pace of advance." As De Quincey wrote, opium was also remarkably attractive: "happiness might now be bought for a penny, and carried in the waistcoat pocket: portable ecstasies might be had corked up in a pint bottle: and peace of mind could be sent down in gallons by the mail coach." [6] And while *Confessions of an English Opium Eater* was written with enthusiasm for the drug, De Quincey's second essay, *Suspira de Profundis*, was a profound sigh of despair at his enslavement to the drug.

By the end of the nineteenth century, amidst a proliferation of newly identified characters, another proto-cyborg had emerged: the addict. If the use of drugs had once been an activity, it now became the defining characteristic of users. 'Addict' was to be one of the twentieth century's most distinct identities, a subtly alien entity; an organism with another chemistry, different perceptions, capacities, desires; a character whose body, as William Burroughs was to write, "knows what veins you can hit and conveys this knowledge in the spontaneous movements you make preparing to take a shot... Sometimes the needle points like a dowser's wand. Sometimes I must wait for the message. But when it comes I always hit blood." [7]

The formulation of the addict was one of the earliest responses to the increasingly vociferous demands for drug control which marked the end of the nineteenth century. The contemporary war on drugs has its most immediate roots in the reformist movements which emerged in the United States at this point, and led to the first national drugs legislation in 1914. International drugs controls were put in place with the establishment of the United Nations in the wake of the Second World War.

By this time, opiates were hardly the only substances to be controlled. The nineteenth century had effectively produced its own narcotics, in an increasingly frantic effort to maintain equilibrium, kill the pain and heal the wounds of industrialization. [8] But subsequent decades of technological change were accompanied by a proliferation of drugs, many of which functioned to accelerate rather than to relieve the pace of change. Opium use may have countered the hyperactivity of everyday life, but in the late nineteenth century, a stressed-out America turned to the stimulation of coca and cocaine in

a literal effort to keep up with the times. There was a tendency to accelerate bodies in accordance with the speeds with which and environments in which they lived into the twentieth century. The synthesis of amphetamines was popularized by the introduction of Benzedrine, a nasal inhaler, in 1932, and by the late 1960s, McLuhan and Fiore were suggesting that the "impulse to use hallucinogens is a kind of empathy with the electronic environment," as well as "a way of repudiating the old mechanical world."

[9] Twenty years later, when the widespread use of MDMA coincided with the emergence of dance music and digital culture, a new generation of drug users reconfigured themselves to deal with the rhythms, connections and complexities made possible by their machines.

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Clynes and Kline's cyborg was born in the midst of long-standing, dispersed experiments—some more legitimate than others—with the pharmaceutical rewiring of the organism. Their prosthetic device was, in effect, an advanced syringe; their cyborg's drugs were sophisticated versions of substances already in use; their cyborg itself was an addict *par excellence*. And the drug-using past of the cyborg is of more than passing interest to its future. The addict, its immediate precursor, was formulated as a late nineteenth-century reaction to what was then increasingly perceived as the drugs problem. Like Foucault's figure of the homosexual, brought onto the scene at the very same time, the addict served to contain activities which were otherwise immeasurable and certainly impossible to regulate. The establishment of the category 'addict,' also served to obscure the fact that the sober are as chemically induced and dependent as their drug using equivalents.

And there is now a sense in which

the cyborg has also served to contain what might otherwise have been an impossible tangle of bodies, chemicals, information, machines, and all the components of a world which actually functions as a vast network of interconnected elements, inconceivable in its own terms. For all the talk of fusions, interactions, links and symbioses, the cyborg popularized by the scriptwriters of Hollywood and academic discourse has been configured as an individuated entity, an organized entity, a self-regulating organism intended to epitomize the modern ideal of self-controlled man. The late twentieth-century cyborg has classified, limited and contained the practices, experiments and explorations which turn both humans and cyborgs into soft machines.

By the same token, both of these figures threaten to expose the very conditions that their construction conceals: the addict and the cyborg problematize the possibility of natural, unadulterated bodies and challenge the modern individual's belief in its own individuality and self-control. And, in much the same way as the consolidation of the addict has produced a multitude of side-effects of its own—drug scenes, cultures, writings, movies, patterns of behavior, industries, economies, wars—so the cyborg has written manifestos, revolutionized conceptions of the human, and shown just how close the order of things is to becoming the disorder of networks. In perfect Foucauldian fashion, it both produces new conditions and possibilities, and also closes them down.

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While the chemical interface has been largely absent from subsequent mainstream discussion of cybernetics, organisms and cyborgs, this has hardly curtailed its continuing exploration at medical, military and street-level. Drugs are active substances, chemical

assemblages, soft technologies for soft machines, xenobiotic devices which interact with the organism to induce what can be profound changes in its structure and function. If there is a population of cyborgs, it lives with, and on, these materials.

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- [1] Manfred E. Clynes and Nathan S. Kline. "Cyborgs and Space," in: Chris Hables Gray (editor). *The Cyborg Handbook*. (London and New York: Routledge, 1995) pp. 29-34.
- [2] Nick Land. *The Thirst for Annihilation*. (London: Routledge, 1992) p. 47.
- [3] The entanglement of drugs with war can even be traced to the vegetable syntheses of many of the substances at issue in the war on drugs. There is substantial evidence to suggest that plants produce chemical weapons which are fatal to their primary predators, but have very different and inadvertent effects on other passing consumers. The chemical weapons with which catnip repels the attacks of certain insects have very different effects on cats, just as those produced in the coca leaf have very different effects on humans. And, whether they are synthesized in organisms or laboratories, the human use of drugs parallels operations at this vegetable scale.
- [4] Paul Virilio. *War and Cinema*. (London: Verso, 1992) p. 85.
- [5] Thomas De Quincey. *Confessions of an English Opium-Eater*. (London: Penguin, 1985) p. 3.
- [6] *ibid.*, p. 39.
- [7] William Burroughs. *The Naked Lunch*. (London: Corgi Books, 1968) p. 85.
- [8] As it happens, and at precisely the same time, opium was also fueling much of the rapid development which then encouraged its use: at the height of the British East India Company's involvement in the opium trade, the British Crown was receiving almost half of its revenue from the drug. Opium was the cure for an age to which it had already brought a sense of unease.
- [9] Marshall McLuhan and Quentin Fiore. *War and Peace in the Global Village*. (New York: Bantam Books, 1968) p. 77.