

HERV-W Ecology of Psychosis: A New Prescription for Health, Equality and
Citizenship in a Post-Genomic World

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UNTITLED

What I believed lost
I have gained.
What was confused
Has suddenly cleared.
And now I see
The path ahead.
And now I see
All I have to win
All I have to conquer.
I see now with
Fantastic joy
And with freedom.¹

¹ The above poem written by a young artist after treatment for first episode psychosis and reveals psychotic illness involves variation. It highlights recovery from the condition is achievable contrary to pessimistic views promoted in Western cultural discourse and practices.

INTRODUCTION

In the 19th and 20th century in parallel with social Darwinism² applied to the races, science was used to justify the genocide of people with neuropsychiatric disease with theories that defined them as defective and unfit. Thomas Malthus and Herbert Spencer are perhaps the most well known for advocating weeding out the sickly in society,³ but the notion of a genetically mentally deficient class, and eugenics as outgrowth, was supported widely around the world.⁴ Few realize preventive medicine introduced in the 19th century by liberal social reformers⁵ led to the mass sterilization of individuals with schizophrenia, which culminated in a "right to die" campaign⁶ in Germany before WWII to eliminate 'unworthy' genes from the population. It is estimated 70,000⁷ "non-functional psychotics" who were declared "mentally dead"⁸ were murdered from 1939 to 1941 by psychiatrists and "ancillary staff, from nurses to transport teams to the hospital janitor."⁹ The euthanasia project was a gateway for the later large-scale killing of psychiatric

² Social Darwinism was based on Herbert Spencer's *laissez-faire* market theory of social evolution derived from the works of Thomas Malthus and Jean-Baptiste de Lamarck. Spencer believed evolution progressed from the homogenous to heterogeneous and changes in societies arose as a consequence of social differentiation, which persisted if they were well adapted to the environment. He believed progress was a necessity and the imperfect in society would be kept in check by the 'invisible arm' of nature. For more details on Spencer's social theory see "Herbert Spencer," *Prospects* 24, No. 3/4, 1994.

³ Herbert Spencer, *The Man Verses the State* (1884), 45.

⁴ In support of negative eugenics several states in the U.S and the provinces of Alberta and British Columbia in Canada, passed compulsory laws to sterilize people with mental deficiencies who were thought to transmit their disability to offspring as a preventive medical measure. In Sweden, a law was passed in 1934 to sterilize mentally retarded and mentally ill people without their consent, and in 1941 sterilization of individuals with so-called defective hereditary natures and severe physical disabilities was permitted as part of national welfare policy. Sweden's eugenic ideals that targeted primarily women existed in other Nordic countries and helped shape German biopolitics along with the United States through international associations, academic and social networks. For information on eugenics in Scandinavia see *Eugenics and the Welfare State: Norway, Sweden, Denmark, and Finland* edited by Gunner Broberg and Nils Rol-Hansen.

⁵ In the 19th century Francis Galton developed medical genetics and introduced the idea of selective breeding in humans for social improvement. His ideals based on the natural laws of Thomas Malthus and Charles Darwin led to the eugenic movement, which sought to improve the human race by controlling reproduction. Liberal social reformers and progressives first adopted Galton's eugenic vision in the form of positive and negative eugenics in Britain and the United States, but state controlled programs later spread across borders and political ideologies. For an analysis of Galton's heredity beliefs and their evolution in Europe see *Modernism and Eugenics* by Marius Turda.

⁶ Elof Axel Carlson, *The Unfit: A History of A Bad Idea* (New York: Cold Spring Harbor Laboratory Press) 2001, 323-327.

⁷ E Fuller Torrey and Robert H. Yolken, "Psychiatric Genocide: Nazi Attempts to Eradicate Schizophrenia." *Schizophrenia Bulletin* 36 (2010), 28.

⁸ Elof Carlson records functional psychotics and the mentally retarded were considered mentally dead by German psychiatrists. See page 324 of his *book* cited above.

⁹ Rael Stous, "Psychiatric Genocide: Reflections and Responsibilities," *Schizophrenia Bulletin* 35(2010), 208.

patients, Jews, and others regarded as degenerate^{10 11} and targeted in an effort to steer human evolution. Shockingly, Western socio-political ideals continue to rationalize and vindicate science's and genetics' involvement in the elimination of genes of people with psychotic illness into the human race through technically adapted social theories, socio-economic policies, genetic research, and high-risk-individual and genetic counselling strategies. The recent discovery that genetic material consists of 8 % ancient human endogenous retroviruses (HERVs) and 42% repeated and mobile genetic elements,¹² however, reveals the deficiencies of reducing biology to practice. HERV-W research in particular poses a fundamental challenge, since inflammatory forms of schizophrenia¹³ involve dynamic interplay between the environment and primate genetic material, genes, phenotypes, and development pathways within the epigenome.¹⁴ Schizophrenia has been uncovered to be highly complex where culture and biology operate interdependently to produce the disease, rather than it being a fixed state and capable of simple eradication.¹⁵

As a result of advances in the field of epigenetics it is now recognized human ecology is plastic and evolves,¹⁶ therefore, it is necessary to revise historical claims that psychosis is a static homogenous condition on a regressive continuum that facilitates eugenics. To

¹⁰ Heinz Haefner, "Comment on E.F. Torrey and R.H. Yolken: "Psychiatric Genocide: Nazi Attempts to Eradicate Schizophrenia" (Schizophr Bull. 2010; 361/1:26-32) and R.D. Strous: "Psychiatric Genocide: Reflections and Responsibilities" (Schizophr Bull. Advance Access Publication on February 4, 2010; doi:10.1093/schbul/sbq003)." *Schizophrenia Bulletin* 36 (2010), 451.

¹¹ The Romani, Sinti, physically disabled, homosexuals, political dissidents, religious groups and citizens of invaded countries were exterminated by the Nazi's as well. It is estimated between 200,000 and 275,000 psychiatric patients and 6 million Jews were euthanized during the holocaust, while the total death toll of the historical crime is more than 11 million people.

¹² Herve Perron and Alois Lang, "The Human Endogenous Retrovirus Link between Genes and Environment in Multiple Sclerosis and in Multifactorial Diseases Associating Neuroinflammation," *Clinical Reviews in Allergy & Immunology* (2009), 4.

¹³ Up to 50% of major psychoses are thought to be associated with neuroinflammation in subcortical regions of the brain. See www.terrapinn.com.2012/european-antibody-congress/presentation-2011-novel-antibody-therapy-approach-in-multiple-sclerosis-and-schizophrenia-114417.stm

¹⁴ In "Confronting the Enigma of Revolution: Natural and Social Science in Transition" I redefined the classic term epigenome based on the research of Herve Perron as a fluid interdependent system, which links genetic and epigenetic inheritance systems.

¹⁵ A discussion has been raised on a Schizophrenia Research Forum whether or not the genocide of people with schizophrenia during the Nazi era in Germany achieved Social Darwinian goals of preventing mental illness in the next generation. Heinz Haefner offers epidemiological studies indicate that large scale attempt to reduce the reproduction rate of people with schizophrenia did not reduce risk. For citation see footnote 11.

¹⁶ For a review of the dynamic role of viruses in human cellular evolution see "Endogenous Viruses: Insights Into Viral Evolution and Impact on Host Biology" by Cedric Feschotte and Clement Gilbert.

break with essentialist biases¹⁷ that assume schizophrenia is genetically determined and unchangeable I will outline core tenets in the discourses on mental pathology by John Locke, John Stuart Mill, Sigmund Freud, and Michel Foucault revealing they are linked by a common language infrastructure.¹⁸ I will disclose that both biological and social environmentalists recycled a fatalistic market-oriented view of psychotic illness founded on classical physics and marginalized affected individuals in society in class arrangement based on rationality.¹⁹ I will then present an alternative ecological model based on HERV-W research supporting it with findings from the fields of epigenetics, early psychosis intervention, and social psychiatry. To establish schizophrenia is an open system involving a variety states of health generated by the environment,²⁰ I will close a historical mind-body gap in liberal psychology and provide first person social recovery graphs along with studies on material inequality in first episode psychosis. I will conclude by discussing eugenic ideals in modern psychiatry that emerge from HERV-W biology as well as offer health rights-based policy direction and insights on human rights theory. Overall, I plan to show we are at a gene-environment interface in epigenetics, and it is time to re-evaluate concepts in science that could validate eugenics on a forced basis in society again in the future.

¹⁷ Paul Griffith explains in *Transformations of Lamarckism: From Subtle Fluids to Molecular Biology* on pages 320-322 that psychological essentialism holds members of a species share an inner essence, which causes them to share typical properties of that kind. He further provides the concept entails expectations about heredity and the notion of DNA closed to the environmental influence involves teleology.

¹⁸ In "Confronting the Enigma of Revolution" I revealed the historical discourse on psychosis shares the same underlying logical tenants based n Charles Darwin's tree of life classification system, consequently, continuity can be found between theorists tackling the subject. This is supported by Natalie Gontier's analysis that the shift to information transmission to information emerging metaphors concerning the nature of genetic material has not reached evolutionary linguists and psychology. See page 178 in "Genes, Brain and Language: An Epistemological Examination of How Genes Can Underlie Human Cognitive Behaviour".

¹⁹ Peter J. Bowler points out on page 285 in *Evolution: The History of an Idea* that the hallmark of eugenics and social Darwinism was the ranking of individuals within a single society into higher and lower classes. The system promoted the idea of linear hierarchy of progress and reflected deep social psychological and ethnic prejudices that prevailed in the 19th and early 20th century.

²⁰ In part one of my thesis I recorded Herve Perron suggests schizophrenia is heterogeneous and may involve several different conditions. HERV-W research further reveals inflammatory-based psychotic disorders share common pathways with other central nervous system diseases and some forms of cancer, therefore, schizophrenia may be an obsolete term. New language is needed to reflect the diverse physical nature of psychotic illness, but in my work I use commonly accepted language.

Call to Action

This paper is the second instalment of an investigation into the role of value in the historical discourse on psychosis. My thesis introduces a novel ecological model based on HERV-W research to begin a dialogue on formulating appropriate mental health policies, laws, and practices that support health equality and citizenship of people with neuropsychiatric disease around the world. For all intents-and-purposes it is a 'call to action' for mental health care community partners and policy analysts to come together and investigate schizophrenia and related disorders in view of 21st century science, particularly the rapidly developing field of epigenetics. Currently, we are at a point in history in the development of science where we understand that microbes are involved in syphilis, an ailment which was once thought to be a psychiatric disorder,²¹ and some cancers can be effectively treated or cured. In view of the present state of knowledge the elimination of genes for treating psychotic illness is unethical, not to mention needless, as new technology is beginning to provide safe primary preventive interventions and hope to all those who are affected.

MECHANIZATION OF THE HUMAN MIND

Beginning in the 17th century with the empirical teachings of John Locke, a view of psychotic illness defined in terms of a regressive process has been reprocessed in liberal philosophy and persists possibly through behavioural and symbolic inheritance systems outlined by epigeneticists Eva Jablonka and Marian Lamb.²² Locke was the first to develop a theory of mind based on a continuity of consciousness and, following Thomas

²¹ W.D. Nicol, M.B., M.R.C.P., "The Relation of Syphilis to Mental Disorder and The Treatment of G.P.I. By Malaria," Delivered before the M.S.S.V.D. Annual General Meeting, July 15th, 1933. See <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1046860/pdf/brjvendis00230-003.pdf>

²² For additional information on epigenetic inheritance systems that involved changes to the phenotype but not underlying DNA see *Evolution in Four Directions: Genetic, Epigenetic, Behavioural, and Symbolic Variation in the History of Life* by Jablonka and Lamb.

Hobbes, boldly redefined the term nature founded on Newtonian physics by arguing that sense and experience was the basis for intellectual production.²³ As a tell-tale sign of interdependency between politics, physics, and biological science in history the moral and political theorist advanced the notion that human activity opposed to divine inheritance could form the basis of private property.²⁴ He posited the mind was like "white paper, void of all characters..." and is open to development of ideas through interaction with the environment, rather than was filled with innate ideas.²⁵ Revealing the influence of philosophic rationalism of his predecessors at the same time,²⁶ Locke forwarded in the state of nature reason served as a guide for the "preservation of the Life, Liberty, Health, Limb or Goods of... [oneself and others]."²⁷ In other words, he argued men were born free and rational, but did not necessarily exercise either²⁸ ²⁹ to create an unequal system of mental development that forms the basis of liberal rights theory.³⁰ ³¹ In the shift Locke incorporated Hobbes's geometrical theory of the human being depicted as

²³ Before Locke social nature was defined by Thomas Hobbes as lawless, which justified the need for monarchical form of government. As a materialist he believed nothing but matter existed. His early mechanical philosophy was a theory a positive law and sovereign authority.

²⁴ Locke developed a pseudoscientific biological model of property rights to justify private property before the overthrow of the English monarchy during the Glorious Revolution in 1688. See *Two Treaties of Government*.

²⁵ John Locke, *Book II: Locke's Essay Concerning Human Understanding*, Chapter I, section 2.

²⁶ Philosophic rationalism formally began with Rene Descartes who introduced the act of thinking defines a person's existence. He introduced dualism into Western philosophy and argued innate (metaphysical) knowledge was accessed through reason. For Descartes cognitive abilities defined personhood, which was a central in John Locke and other liberal theories as well. A key difference among empiricists, however, was that the capacity for knowledge although innate was acquired through experience. Using language of his time John Locke was the first to define intelligence as a biological trait that involved a process of development through interaction with environment in his *An Essay Concerning Human Understanding*. He likewise assigned mental deficiency as a trait that limited self-awareness in his uneven mental development scheme, which J.S Mill supported.

²⁷ John Locke, *Two Treaties of Government* (New York: New American Library, 1960), 311.

²⁸ John Locke, 350.

²⁹ Locke argued in his chapter 6 of the *Two Treaties of Government* that children are not born into a full state of equality. They are otherwise born ignorant and it is the parent's responsibility to inform a child's mind. He further provided the mentally deficient are ignorant and are never set free from authoritative rule of government, or parents due to their lack of capacity to know the law. Locke excluded people with mental disorders from his social organization formula based on their capacity to understand laws of nature, which set up a genetic view of their mental state and the historical association of psychosis with infant development.

³⁰ Locke's theory formed an important school of rights theory based on the equality of opportunity, not condition.

³¹ Edwin Fruehwald from Hofstra University School of Law advances in a behavioural biology model of rights that there is no equality in the natural world. According to Fruehwald under social contract equality exists in the form of opportunity only, not equality of outcome. He posits if everyone were made equal the survival chances among individuals in society as a whole would diminish. See "A Biological Basis of Rights", Hofstra University School of Law, 32. Available on-line at <http://ssrn.com/abstract=1440247>

"a system of self moving, self-guiding matter in motion".³² Like Hobbes, he sought to work out the relationship of men to the state, however, he used a hybrid mechanical model that bridged old and new physics³³ to reconceptualise reason in a new synthesis to accommodate social changes.

Early Systems Theory

The enlightenment empiricist's theory of mind corresponded with his labour theory of property and value, which held that activity produced energy by the "industrious and rational"^{34 35} transformed passive nature into useful wealth before and after the introduction of money.³⁶ For Locke, both mental and physical labour was the arbitrator of value before the formation of society and differences in capacity for work was predetermined under the rubric of natural law.³⁷ Predating John Baptiste de Lamarck's organic theory of development by over a century,³⁸ he created an early system of interaction that generated motion to increase moral and material reward³⁹ unequally assigned to some to individuals in the state of nature through a process of self-actualization.^{40 41 42} By combining Newtonian physics with economic concepts, Locke

³² C. B. Macpherson, *The Political Theory of Possessive Individualism: Hobbes to Locke* (New York: Oxford University Press, 1962), 18.

³³ John Locke was a proponent of mechanical philosophy, which was developed by Rene Descartes and Thomas Hobbes and before them Galileo and Kepler. The theory was based on a machine model of nature that separated immaterial and physical objects and held external force was necessary to propel matter. Locke depicted the psyche as inert matter, which moved through space in relation to other objects in a process of progressive development. Thomas Hobbes, on the other hand, rejected Cartesian dualism and argued thought was pure matter in perpetual motion. He favoured atomism marked by a view of the physical universe made up of extended continuous small bumps that are intrinsically indivisible. See chapter two and three of *Leviathan* for Hobbes's mental discourse.

³⁴ John Locke, 340.

³⁵ On page 333 of *Two Treatises of Government* Locke argued God gave the world to men in common, but qualified he gave it to the industrious and rational not the fancy or covetousness of the quarrelsome and contentious. The passage reveals the biodeterministic persistence of divine inheritance in his property theory, which justified unequal and unlimited property rights.

³⁶ John Locke, 343.

³⁷ John Locke, 343.

³⁸ French Zoologist John Baptiste de Lamarck developed an early theory of evolution based on activity of animals in nature. An animal's labour in nature was thought to spontaneously produce new organs in a single generation. Conversely, inactivity led to extinction.

³⁹ Blessing which means 'favour from God' is perhaps the best word to describe the unequal assignment of capacity for moral and material growth in the state of nature by John Locke. Although he would have no concept of genetic inheritance, Locke would be familiar with divine inheritance to explain his biodeterministic theory of pleasure and labour.

⁴⁰ Locke's interactive theory of mind introduced the concept of friction to propel development in psychic space, which is significant because in Newtonian physics space is empty and objects require external force to generate (accelerated) motion.

predated Einstein's general relativity conceptually by filling psychic space, considered empty like the universe, with complex ideas considered archetypes produced by the mind.^{43 44} Notably, most people were considered incapable of developing composite thinking, since they were thought to be naturally prone to over preoccupation with sensory pleasure.⁴⁵ Consistent with the principle of inertia in mechanical physics⁴⁶ intellectually deficient people were sub-classed as idiots whose mental life was passive and contained "little matter", or madmen whose minds were incapable of cohering ideas and producing meaningful activity.⁴⁷ Locke's rustic logic⁴⁸ reified madness further in another division as an outgrowth of "violent imagination" and wrong ideas were alleged to be disorganized at different rates in affected people.⁴⁹ Similar to Hobbes who described the condition as "rage" and "the abuse of words",⁵⁰ his early psychology described psychotic illness as a natural state of war. He placed both idiots and madmen

⁴¹ In John Locke's *Book II: Locke's Essay Concerning Human Understanding*, Chapter I sections 2-8 Locke described ideas are formed by experience, which produce sensation and then undergoes an internal process of reflection to generate understanding. In section 7 he asserted simple ideas that form the basis of more complex ones are unequally distributed based both on a person's number of experiences and internal capacity for reflection. Like his property theory of value, he placed constraints on mental development.

⁴² In section 27 of the *Two Treatises of Government* Locke posited that every man possesses property in his person and whatever he takes from the state of nature becomes his because his person is mixed with it through the act of appropriation. Revealing structural inequality in his philosophy, however, slaves and the mentally deficient were not included in Locke's theory of private property. Slaves were considered property themselves who produced value for slave owners and the mentally disordered were considered incapable of labour, which Locke depicted as a condition of human life. (i.e. section 35) In effect, slaves and the mentally deficient in common did not possess capacity to labour as their own property and thus value realizing potential except through others.

⁴³ Complex ideas were made by the made out of simple ones through a process of 1) combining several simple ideas to compound ones 2) juxtaposing ideas to view them relationally and 3) abstraction. See chapter XII in *Book II: Locke's Essay Concerning Human Understanding*.

⁴⁴ John Locke, *Book II: Locke's Essay Concerning Human Understanding*, Chapter IV, section 5.

⁴⁵ In chapter IV of his psychological manuscript outlining knowledge formation Locke points out solidity fills mental space through a process that involves resistance, which builds on his concept of activity operating as a catalyst for complex thinking. The lack of self-reflection leads to simple sensory thought according to Locke.

⁴⁶ H.W. Warren explained inertia in *Recreations in Astronomy* as 1) a body that is at rest has no motion at all or 2) if a body is in motion it will continue in straight line unless forces acts on it. The concept of inertia was central in Locke and Thomas Hobbes corpuscular theories of mind. Hobbes believed the mind was inert and mental development was propelled by force, which degenerated back to an inert state. Locke accepted the idea of origin of mind as inert, but made a case for progressive intellectual growth in the property classes. See chapters 1-6 in *Leviathan* for details on Hobbes' psychology.

⁴⁷ John Locke, *Book II: Locke's Essay Concerning Human Understanding*, chapter XI, section 13.

⁴⁸ Locke was an early proponent of psychologism. His logic is classified as psychological individualism and J.S. Mill went on to develop the logical system further. For a history of psychologism see "Is Logic All in Our Heads? From Naturalism to Psychologism" by Francis Pelletier and colleagues.

⁴⁹ John Locke,, section 13.

⁵⁰ Thomas Hobbes, *Leviathan*, Edited by C.B. Macpherson (England: Penguin Books, 1968), 140, 146.

on the level of animals^{51 52} along a continuum of degeneracy with slaves,⁵³ which effectually introduced class consciousness in liberal theory. As a key insight, the lack of cognitive differentiation functionally exposed assigned individuals to extinction.⁵⁴

As a product of inductive reasoning Locke's dualistic model of development justified excluding the mentally deficient and races from entry into the social contract.⁵⁵ More divisively, the lowest classes in his physics derived hierarchy were segregated on a species level from the human race setting up a deep-rooted pattern of social, economic, and political discrimination. As for general classes, political scientist C. B Macpherson pointed out Locke saw them as otherwise wanting to preserve their lives by joining society. As a distinction only individuals with property were considered full members in civil society, however.⁵⁶ Not venturing far from Hobbes who argued that the nature of man was in a state of war like "mad-men",⁵⁷ labouring classes were considered underdeveloped and at risk of lapsing into degeneracy.⁵⁸ It was believed only men of estate developed rationality and freedom, therefore, they exclusively formed, and benefitted from, social organization and power. They were the benevolent and virtuous

⁵¹ John Locke, chapter XI, sections 9-15.

⁵² In chapter five of the *Two Treaties of Government* Peter Laslett explained that the distinction that set man apart from beasts during Locke's generation was reason. The absence of reason identified man as a brute, furthermore, unreasonable behaviour set apart an individual as an animal and justified his mistreatment.

⁵³ Slaves were considered property received through just war and had no value outside the slave relationship. See section 85 in the *Two Treaties of Government*.

⁵⁴ Inertia implies homogeneity and death. It is critical to recognize in evolution the lack of differentiation is an evolutionary impossibility, and suggests the concept applied to brain disorders is rooted in the Christian concept of the 'fall'. In microphysics the notion of matter at rest is an absurdity because it exists only as energy according to Gaston Bachelard.

⁵⁵ In chapter 9 of *Two Treaties of Government* Locke argued men united and joined society to protect their Lives, Liberties, and Estates. He provided in section 128 that if it were not for the corruption and viciousness of degenerate men there would be no reason to leave the state of nature and form political society. Locke's social contract did not include the mentally deficient, or slaves who lost their life, liberty and estate in conquest and laid the foundation for their marginalization. Highlighting the complete annexation of the mentally incapacitated individuals that persists in modernity John Stuart Mill made a case for the right of slaves to work for a fair wage in his paper entitled "The Negro Question". The right of people with psychiatric disease to work is yet to be firmly established and this is critical point because in liberalism labour defines a person as human, while the exchange of labour on the market determines access to political and legal rights.

⁵⁶ C.B. Macpherson, 248.

⁵⁷ Thomas Hobbes, 183-186.

⁵⁸ In his book the *Political Theory of Possessive Individualism* C.B. Macpherson posited that Locke held labourers who had no property did not and could not lead a fully rational life. They were viewed as incapable of knowing the laws of nature. In a major catch-22 Locke believed men who violated nature's laws became degenerate. See pages 222-227 and 240-241.

few, while everyone else was considered trapped in a competitive struggle for survival,⁵⁹ which hindered their chances for a fully realized life.⁶⁰

Expanding the Hierarchy in Liberalism

David Ricardo,⁶¹ a friend of Thomas Malthus who generalized the idea of illness as natural⁶² was the first person to transform liberalism from a theory of individual human development into an organized class-based system.⁶³ Drawing a parallel between politics and science in support of the historical shift to class, John Stuart Mill later argued in an essay on political economy that truths organized themselves into classes according to natural affinities.⁶⁴ ⁶⁵ As a sign of the times, he reformulated natural law steeped in theology and justified uneven social development with a structured theory of external interaction based on mechanical principles⁶⁶ and established a liberal credo based on self-improvement and self-government. In his treatise, *On Liberty*, the 19th century utilitarian presented liberty existed in human consciousness⁶⁷ and elevated the freedom of thought⁶⁸

⁵⁹ C.B Macpherson, 224-227.

⁶⁰ C.B. Macpherson argued the source of differential rationality for Locke was socially acquired, and then became permanent on page 246 of *Political Theory of Possessive Individualism*. I suggest human psychic variation was considered innate based on natural laws of reason. For an outline of Locke's the natural laws of reason see chapter 6 of *Two Treatises of Government*.

⁶¹ Adam Smith is considered the father of the classical school of economics, but David Ricardo is credited with developing political economy into a formal system. In the history of the Classical School of economics there is debate about when and who was involved in the shift from laissez-faire economics to political economy marked by state interventionism. Jeremy Bentham is credited with supporting both laissez-faire and state intervention depending upon the utility in the given context. After his death the utilitarian school split on this and related issues of democracy and class.

⁶² Thomas Malthus who supported laissez-faire economics expanded Locke's illness concept by arguing illness was a normal state on the general level of society. He developed a theory of mind in his essay to Mr. Godwin that limited the capacity of the mentally deficient and working class to develop reason, which justified limiting their reproduction.

⁶³ David Ricardo, *On the Principles of Political Economy and Taxation* (1817), Chapter 1, Section VII.
www.marxist.org/referecne/subject/economics/ricardo/tax/cho1.htm

⁶⁴ John Stuart Mill, "On The Definition of Political Economy; and on the Method of Investigation Proper to It". *Essays on Some Unsettled Questions in Political Economy* (1844). "See 2nd paragraph.

⁶⁵ Mill held that the mind is composed of sensations and ideas that are organized by various associations. He developed a pseudo-scientific form of mental chemistry where repeated stimuli created associations in the mind to form cognition. For a primer on the psychological theory see "Psychology: The Beginnings" by Dr., C. George Boeree

⁶⁶ J.S. Mill's theory sought to interpret natural law in terms of laws of force in Newtonian physics and chemistry principles, rather than fall back on Locke's notion of inherited rationality. For information on his scientific rationale see John Mill's works *On Nature* (1874) and *Of the Composition of Causes* (1859)

⁶⁷ For Mill freedom existed on the mind and developed along a progressive continuum. Mill argued true ideas and intelligence were considered higher than the opinion of the masses with moderate intellect. It is worth noting in his psychological model of freedom was dependent on intelligence, therefore, the mentally deficient were completely excluded from his rights theory. It must be understood that although the mentally deficient were assigned sentience, they were equated with animals who were not considered moral agents.

⁶⁸ John Stuart Mill, 15, 16, 33, 34.

⁶⁹ to protect the emerging property class from general society who was considered incapable of separating truth from opinion. Mill defended the right of intellectuals to freedom from public tyranny,^{70 71} which he considered more threatening than political oppression because in liberal psychology the environment was the wellspring for intellectual growth.⁷² For early environmentalists, experience was heritable,⁷³ so the threat to freedom from the community identified as irrational was greater than from the state.⁷⁴

In the language of physics, Mill redistributed rights in social space by amalgamating the classes into a homogenous group. A single class was then sub-divided in a branching pattern⁷⁵ to set the populace apart from mental and material property owners. In a pioneering division Mill made a distinction between the middle class who were "moderate in intellect, but also moderate in inclinations" and the lazy and impassive lower classes with a weak conscience to justify their marginalization.^{76 77 78} His model of class consciousness set apart people who pursued "animal pleasures" as polar opposites of geniuses declared more individual than others^{79 80} and functioned as an "accumulating force... [to] push a favoured few right up to the top and out" of his social hierarchy like

⁶⁹ Mill equated freedom of thought with mental well-being and assigned mental-wellbeing as foundational to all other forms of well-being, which represents a formal shift to logical psychologism in liberalism. See page 49-50 in *On Liberty*.

⁷⁰ John Stuart Mill, 13.

⁷¹ Mary Ann Glendon, *Rights Talk: The Impoverishment of Political Discourse* (New York: The Free Press, 1991), 52-53.

⁷² Locke established knowledge developed through accumulated experience through interaction with the environment, which Mill also advanced although for him it was social process. Herbert Spencer further explained the evolution of intelligence as occurring as a result of a coordinated group of external phenomenon that produced a coordinated group of internal changes. See page 413 in *Herbert Spencer, The Principles of Psychology (1855)*.

⁷³ Lamarckian evolutionary concepts of heredity dominated the 19th century in Central Europe and North America. It was believed that long-term habits would develop new traits and be passed onto progeny. For a review of heredity ideas in the 19th century see "Parent and children: idea of heredity in the 19th Century" by John Weller.

⁷⁴ Like Emmanuel Kant, Mill believed animal nature was innate and discipline and education did not forge it into human individuality. As a result, he sought to segregate the upper classes from the masses through a ridged moral system of law. For comments on Kant's thinking on nature and education by Slavoj Žižek see *Cognito, Madness and Religion: Derrida, Foucault and then Lacan*.

⁷⁵ A branching pattern of social differential from homogeneity to heterogeneity depicted by speciation in Darwinism can be seen throughout liberal discourses.

⁷⁶ John Stuart Mill, 64.

⁷⁷ John Stuart Mill, 55.

⁷⁸ Mill outlined in his essay *On Nature* that the poor are evil, sickly, incapable of exerting themselves, and are sometimes mentally feeble. See page 142.

⁷⁹ John Stuart Mill, 72.

⁸⁰ John Stuart Mill. 57, 60.

other progressivists.⁸¹ As an observation by perpetuating Locke's psychologism Mill excluded the mentally deficient from his purview of rights.^{82 83} In doing so, he bound up individuals with psychiatric illness by denying them citizenship and stigmatizing and punishing illness through a ridged moral behavioural system. As morbid consolation in a reverse system of equality Mill denied liberty embodied in rights to the lower classes as a whole with his moral distribution scheme, which did not recognize the influence of culture in human social conduct.

It is important to recognize Mill's scientific theory of freedom and rights cast a death blow to the class on the lowest rung of the vertical social ladder that became symbolic of primordial mind in liberal history.⁸⁴ Like psychologist James Mark Baldwin, who later introduced anti-social mental traits caused by a defect in "physical heredity" required sanctions and punishment,^{85 86} unusual social behaviours caused by psychiatric disease were considered individual rights that infringed on society⁸⁷ and justified social isolation and legal action. Although not punishable by law, drunkenness, gambling, laziness, and even uncleanness were shortlisted as acts of volition⁸⁸ injuring happiness and hindering

⁸¹ Stephan Jay Gould, *Full House: The Spread of Excellence From Plato to Darwin* (New York: Three Rivers Press, 1996), 27.

⁸² Ellen Frankel Paul advanced in "J.S. Mill: The Utilitarian Influence in the Demise of Laissez-Faire" *Journal of Libertarian Studies* on page 146 that idiots, lunatics, and children were considered incapable of acting for themselves. Like John Locke they would have been excluded from benefitting from the law. (See footnote below). People with psychiatric disabilities continue to be marginalized in human rights law through the separation of mental health and health rights.

⁸³ In chapter 6 of the *Two Treatises of Government* Locke identified people with mental deficiency were incapable of knowing the law and as a consequence were incapable of freedom represented by it.

⁸⁴ In 400 B.C Greek physician Hippocrates viewed mental illness as a disease caused by the malfunction of the body fluids, rather than a curse by the Gods. Plato saw madness as divine and in the 15th century delusions and hallucinations were associated with demon possession. Later in the 19th century psychosis was equated with moral degeneracy and primal mind. For a history of schizophrenia see "Notes on the History of Schizophrenia" by Theocharis Chr. Kyzirdis

⁸⁵ Bruce H. Weber and David J. Depew ed. *Evolution and Learning: The Baldwin Effect Reconsidered* (Cambridge MA: The MIT Press, 2007), 199.

⁸⁶ Mark Baldwin developed a theory known as organic selection in 1895 where instinctual and acquired behavioural traits in populations are inherited. Similar to John Locke and J.S. Mill, Baldwin's early niche construction hypothesis limited the capacity of some people in society for conscious learning as a result of an inherited defect. Baldwin articulated a distinction between natural disposition and social learning in chapter 2 of *Social and Ethical Interpretations in Mental Development: A Study in Social Psychology*. He argued in order for people to learn they must not have hereditary tendencies to be antisocial. The predisposition to learn was a prerequisite for developing psychic complexity through a process of self-reflection like other liberal progressive psychologists depicted.

⁸⁷ John Stuart Mill, 82.

⁸⁸ Mill's argued in his theory of social choice people who exhibited immoral behaviour had a weak conscience and impassive nature, which implied they were incapable of moral choice. In a major contradiction he went on to advance social ostracization and

social improvement.⁸⁹ Today the approach has perpetuated medical⁹⁰ and social neglect, and in too many cases, suicide.⁹¹ Tragically, stigma and discrimination and other injustices are intrinsic in the liberal mental health legal discourse now reduced to "rights talk",⁹² since it narrowly comprehends mental disorders in terms of psychological symptoms and does little to promote life, health, and well-being. Individuals, "rubberstamped damaged goods in big red letters on their foreheads,"⁹³ are provided negative rights to make up for the loss and is arguably inadequate.

Transition to Open Thermodynamic Systems

In a radical turn in the 20th century Sigmund Freud reformulated class consciousness in liberalism by creating a self-propelled system of development based on internal activity in the mind.⁹⁴ I mentioned his phenomenological approach in the first half of my thesis, but it is worth going over here because it played a pivotal role in the discourse on psychosis. Reflecting the work of G. W. F. Hegel,⁹⁵ Karl Marx, and other theorists⁹⁶ the psychoanalyst formulated a "thermodynamic psychology" by conceptualizing entropy

punishment are justified if people chose immorality when it infringed on the rights of others. His circular logic is completed by his proposition choice is necessary for moral and intellectual development.. See pages 55, 56, 72.

⁸⁹ John Stuart Mill, 74.

⁹⁰ Marion Leboyer and David Kupfer report the most common causes of natural death from bipolar disorder are cardiovascular disease and cerebrovascular disease. See page 12 in "Bipolar Disorder: New Perspectives in Health Care and Prevention."

⁹¹ A collaborative study by suicide researchers reports 5-13% of people with schizophrenia die by suicide.

⁹² Mary Ann Glendon defines rights talk in her book *Rights Talk: The Impoverishment of Political Discourse* as the legalization of popular culture where laws are increasingly seen as the carrier of values shared in society and frame social controversies in terms of clash of rights. See chapter 1.

⁹³ The quotation is derived from the unpublished manuscript of a young adult who recovered from first episode psychosis.

⁹⁴ I identified dialectics based on physics principles was utilized as the method to generate friction to act as a catalyst for psychic development in "Confronting the Enigma of Revolution". Freud developed a theory of self-reflecting mind based on the interaction of the id, ego, and super-ego.

⁹⁵ Hegel developed a phenomenological theory of madness where the mind differentiated itself in a system parallel to the rational mind. Based on a theory of interaction from the interior of illness schizophrenia was seen as conscious awareness of contradiction between withdrawal into the feeling soul and objective consciousness. The disorder clumped with several others under the category of mania and was an attempt to show that madness was not static, but evolved through experience. In "Confronting the Enigma of Revolution" I pointed out Hegel and Freud similarly depicted psychosis as a regression to a primitive (symbolic) state of mind. For details on Hegel's contribution to the field of psychology see *Hegel's Theory of Madness* (Albany: State University of New York Press, 1995).

⁹⁶ Freud's theory of mind introduced the psyche was governed by Euclidian laws of physics like Immanuel Kant. It also reflected ideas by his supervisor at the University of Vienna (i.e. Ernest Wilhelm von Brucke) who proposed the concept of psychodynamics in 1874 in lectures on physiology in collaboration with physicist Hermann von Helmholtz who was one of the formulators of the first law of thermodynamics.

defined as the tendency for physical systems to evolve to higher state of disorder⁹⁷ as a "model for the life of the mind itself."^{98 99} Like Malthus's theory of mind that limited mental growth,¹⁰⁰ Freud attacked the idea of cognitive perfectibility with a reverse system of evolution. He introduced a sociological concept of time symmetry¹⁰¹ by stretching abnormal psychology across society where he quantified several mental conditions and behaviours on the same continuum.¹⁰² Essentially, Freud changed the trajectory of mental development from consciousness to unconsciousness on the level of civilization, which reduced the space between intellectual property owners and degenerate classes. On a micro level, he sub-divided mental pathology into discrete units and reclassified mankind as socially produced "toxic" individuals.^{103 104} Predictably in his effort to equalize the classes though, the psychoanalyst excluded people with psychosis from his pathological estate.¹⁰⁵ In step with other libertarians they were considered unable to generate productive thought and assigned as a sub-class predisposed to self-dependence.^{106 107 108}

In effect, degenerate and middle classes were unified by Freud, but the mentally deficient

⁹⁷ The mechanical theory of heat based on a single arrow of time was introduced by Rudolf Clausius in 1850. His 2nd law of thermodynamic explains irreversibility in nature and is considered the central dogma in molecular biology, since it does not recognise time reversal symmetry.

⁹⁸ Matteo Pasquinelli, "Introducing Four Regimes of Entropy: Notes on Environmental Fatalism and Energo-Determinism," *Beyond Entropy Symposium, Fondazione Cini* (2010), 2.

⁹⁹ Matteo Pasquinelli identifies Freud's death drive followed the entropy arrow in his essay *Beyond the Pleasure Principle*.

¹⁰⁰ In *An Essay on the Principles of Population As It Affects the Future Improvement of Society with Remarks on the Speculations of Mr. Goodwin, M. Condorcet, and Other Writers*, Thomas Malthus argued that man is born into chaotic matter and equated the mind with matter to make a case for internal restraints on mental growth. His progressive model provided man's mind was corrupt and inert and identified food supported life (which played a key role in his catastrophe theory) and helped form mind into reason. Malthus presented an asymmetrical biodeterministic model of mind based on metaphysical precepts by arguing well-formed minds are created by God and crowned with immortality. Malformed minds on the other hand were doomed to perish. See pages 36-40 or chapter 18 and 19 for additional details.

¹⁰¹ In *What's Next: Future Dispatches in Science* on page 47 the modern physics concept of time symmetry is explained as time that is equal in the past and future.

¹⁰² See chapter 2 in *Civilization and Its Discontents* for details on pathological categories marked by social withdrawal and isolation.

¹⁰³ Freud described mental pathology as toxic and explained people withdraw from the pressure of reality based on discontinuous hierarchical model in chapter 2 of *Civilization and Its Discontents*.

¹⁰⁴ Psychosis is represented as a construction of a delusion represented by an infantile state and is representative of Freud's discontinuous theory of mind.

¹⁰⁵ In "Confronting the Enigma of Revolution" I identify Freud presented the ego as evolving through historical psychic paradigms set in motion by sexual guilt based on his Oedipus complex. Psychosis is depicted as a devolution to an earlier infantile state. See pages 29-31.

¹⁰⁶ Thomas Hobbes also forward the idea that people with mental disorders were prone to sensory preoccupation. See page 140 in *Leviathan*.

¹⁰⁷ See footnote 10 on page 36 in *Civilisation and Its Discontents* by Freud.

¹⁰⁸ In *Civilization and its Discontents* on page 35 Freud explain people with psychosis born with a specially unfavourable instinctual constitution are prone to psychosis. He perpetuated the hierarchical model of animal nature established by John Locke.

escaped reclassification like Mill's intellectual property group.¹⁰⁹ They remained rigidly fixed at the bottom of the social hierarchy as unproductive intellectual labourers,¹¹⁰ which was assigned as an act of choice in contradiction of Freud's argument.¹¹¹

Microeconomic Theory of Mind

Taking the place of fluid mechanics to close the gap between the classes in the late 20th century, Michel Foucault argued abnormal behaviours in society were produced by a network of discourses and practices using strategic logic.^{112 113} Conceptually, his open system of power transformed individuals by constructing their values through a positive feedback loop,¹¹⁴ which stretched over the field of social space like gravity in celestial space.¹¹⁵ Applying quantum physics, like Thomas Kuhn who advanced language as a social and political instrument, Foucault distinguished a "lumpy"^{116 117} pattern of development identified as dialectics¹¹⁸ in my first paper and forwarded historical epistemes separated past and present history.¹¹⁹ Influenced by French epistemologists,¹²⁰

¹⁰⁹ Mill outlined in *On Liberty* on page 21 only 1% of the population in history was capable of discerning truth from opinion. In a curious parallel 1% of the population are reported to suffer from schizophrenia in gene-centric prevalence studies. Statically, 98% of the population are a part of the liberal middle class hierarchy, opposed to the 99% Mill reports.

¹¹⁰ As a distinction from Locke and Mill who did not discriminate normal and pathological states in people with mental illness Freud assigned simple thought to people with psychosis in the pre-psychotic phase. In effect, he applied use-value to individuals like the rest of the lower classes before regression to psychosis.

¹¹¹ In *Civilization and Its Discontents* Freud describes psychosis as rebellion. See page 36.

¹¹² Peter Atterton, "Power's Blind Struggle For Existence: Foucault, Genealogy and Darwinism," *History of Human Sciences* 7, 1994, 10.

¹¹³ In *The Birth of Biopolitics* Foucault wrote on page 42 he used strategic logic to establish connections between disparate terms that remained disparate.

¹¹⁴ In "Power's Blind Struggle for Existence: Foucault, Genealogy and Darwinism" Peter Atterton provided Foucault's system of power based on Darwinism tended to become hegemonic as a result of positive feedback of discourses and behaviours that were repeatedly selected. See page 10.

¹¹⁵ According to Pamela Major-Poetzl Foucault utilizes concepts from Clerk Maxwell's electromagnetic field theory, which denotes the energy between particles determines electrical action. She posits Foucault's work on archaeologies may be considered field histories where there are no material actors, only a web of interrelationships in a neighbourhood. See page 63-65 in her book referenced above.

¹¹⁶ Pamela Major-Poetzl, 71, 73, 78.

¹¹⁷ In quantum physics energy is not continuous, but exists in small but discrete units. Brian Green explains on microscopic scales space and time is not smooth, but is frantic and jittery because during inflation in space gravity forces matter to form clumps. Once clumps are formed, they attract more matter to increase in size. This process known as inflationary cosmology is thought to have resulted in the formation of galaxies and stars. For more information see chapter 11 of *The Fabric of the Cosmos: Space, Time and the Texture of Reality*.

¹¹⁸ John Grant from Brock University in Ontario, Canada argued that despite Foucault's claim to the contrary his operational logic of power and resistance is evidence of dialectics in his work. See "Foucault and the Logic of Dialectics," *Contemporary Political Theory* 9, No. 2, (2010).

¹¹⁹ Episteme was coined by Foucault and is qualitatively more broad than Thomas Kuhn's paradigm, which only addressed scientific knowledge. It is an apparatus covering the entire field of science that allows for scientific validity of statements in any given epoch in

he advanced madness (as he coined it) like scientific knowledge was comprised of moments of spacetime¹²¹ in an attempt to achieve greater social equality. Connecting Foucault to the past, however, he created a dualistic theory of mind and assigned psychosis as an inevitable product of repressive culture like Freud by adopting the pattern of anatomical complexity in Liberalism.¹²² His early writing depicted "the very sick patient" undergoing reverse natural evolution,¹²³ but as a key difference described the state as a "void" that entailed a disappearance of "complex coordination and spatial orientation", not a return to an imaginary past.^{124 125} For Foucault, the disordered mind was filled with activities represented by consciousness as an alternative.^{126 127} Later on, he characterized the "schizophrenic world" as simple thought attributed to normal classes in liberal psychology and redefined the sensory state as "variable and heterogeneous meaning according to the period...".^{128 129} Transcending classical theorists, schizophrenia was transformed from unproductive space to fractured individuality with

history. The concept of discontinuous paradigms in history that Foucault depicted as an entirely new 'grille' is derived from French philosopher Gaston Bachelard's theory of epistemological rupture, which denotes a break from everyday experience that limits progress in science. Bachelard reportedly influenced Kuhn and several others.

¹²⁰ Gaston Bachelard and Georges Canguilhem were both teachers of Foucault's and their historical epistemology and psychoanalysis of science is evident in his work. Bachelard's founding archaeology of physics Pamela Major-Poetzel records on page 120 of her book is comparable to Foucault's archaeology of psychiatry.

¹²¹ Stephen Gould advanced a parallel concept of (geological) time marked by long periods of stasis and rapid punctuated change in his neo-Darwinian theory of evolution.

¹²² Stephen Gould defined progress as the tendency for life to increase in anatomical complexity, or any other criterion that puts homo sapiens on top of a supposed heap in *Full House: The Spread of Excellence From Plato to Darwin*. I suggest Foucault followed the early liberal pattern of progress like Freud in reverse.

¹²³ Foucault's early model of schizophrenia followed a progressive deteriorating pattern. See pages 44-47 in *Madness: The Invention of an Idea*.

¹²⁴ Michel Foucault, *Madness: The Invention of An Idea*, trans. Alan Sheridan (New York: Harper Perennial Modern Thought,) 2011, 28-30.

¹²⁵ Pamela Major-Poetzel, 108

¹²⁶ In part one of his book *Madness: The Invention of an Idea* Foucault argued psychosis was a suppression of higher functions that operated on the level of consciousness, rather than was a regression to unconscious life (or sick personality) as Freud did. Similar to other liberals, however, Foucault presented the condition as a phenomenological process involving a separation between simple and complex thought, which was marked by impaired consciousness, or chaos. For a critique of Foucault's' early concept of psychosis read chapter 4 in *Michel Foucault's Archaeology of Western Culture* by Pamela Major-Poetzel.

¹²⁷ Foucault introduced perceptual variation to psychosis as a distinction from Freud's' homogenous model.

¹²⁸ By assigning limited mental activity based on Locke's labour theory of value to people with schizophrenia Foucault assigned they were capable producing use-value.

¹²⁹ Pamela Major-Poetzel, 116.

quantum concepts.¹³⁰ His evolving work explained mental illness broadly as a retreat from a hostile world, defective language,¹³¹ ¹³² and an element of reason and history¹³³ although the expansions were quantitative, not qualitative. Paradoxically, the assigned post-structuralist imposed structure onto psychology, despite his criticism of others for doing so.

In general, Foucault argued psychiatric disease was caused by colonization of the mind¹³⁴ through micro level "invisible hand"¹³⁵ market knowledge and practices,¹³⁶ which reduced the capacity for abstract labour in genetically susceptible individuals.¹³⁷ His socio-political model of cognition presented serious mental disorders as a closed system¹³⁸ caused by a resistance to power¹³⁹ and effectively diminished those affected as a group like his compatriots to *economic human* narrowly capable of self-interest.¹⁴⁰ ¹⁴¹

Unavoidably, since his work was founded on liberal discourses, Foucault marginalized

¹³⁰ By assigning simple thought to people with mental disorders during the illness state Foucault introduced solidity to psychic space, which theoretically acknowledged their humanity. It must be recognized he placed constraints on humanity at the same time, since fragmented simple thought represented incomplete mental development. For his review of psychosis depicted as 'frozen identity' see page 28-29 in *Madness: The Invention of an Idea*.

¹³¹ Pamela Major Poetzl, 111, 116.

¹³² Foucault posited mental illness was a product of language of psychiatry in chapter 6 of his book *Madness and Civilization* he presented patients with delirium as being treated for imaginary illness with an imaginary cure, which in the process pathologized the condition. Both mental illness and psychology as a therapeutic discipline are depicted as a (socially constructed) systems based on language with nothing in common with the previous age.

¹³³ In *Madness and Civilization* Foucault used a binary model of reason and unreason to explain the history of madness from the middle ages to the Enlightenment. In his book, he depicted serious mental illness as the absence of work and crisis of reason according to Jacques Derrida. See footnote 147 for more commentary on Foucault's novel interpretation of classical reason as well as a reference for Derrida.

¹³⁴ In Foucault's theory discourse language is a constitutive component of the social world and is involved in meaning making according to Lile Chouliraki in *The SAGE Handbook of Cultural Analysis*.

¹³⁵ Foucault depicted the liberal market economy in his discourse on governmental rearticulation through imagery of circulation and regulation through incentives according to Ute Tellmann. Reference is available on page 13 in "Foucault and the Invisible Economy".

¹³⁶ Michel Foucault, *The Birth of Biopolitics*, trans. Graham Burchell (France: Palgrave-Macmillan, 2010), 19.

¹³⁷ Foucault stated in his original preface of *Madness and Civilization* that madness was a void marked by an absence of work, which was sometimes accessible through its original and crude language. See page 106 in the *Passion of Michel Foucault* by James Miller.

¹³⁸ In thermodynamics a closed system can exchange energy, but not matter with its surroundings. It is largely sealed from the environment, therefore, entropy toward greater disorganization occurs. Stephan Gould pointed out in his book *Full House* on page 24 entropy only exists in closed systems, which aligns Foucault's model of schizophrenia with 19th century thermodynamic theory. It is important to point out Foucault's logic assigned the psyche was partly open to environmental influences, however. By comparison Freud depicted the mind as a totally closed system of internal development. The advancement allowed Foucault to argue mental illness had its own internal meaning, rather than was a regression to a symbolic primitive state.

¹³⁹ According to Dr. Emma Bell from Brighton University, Friedrich Nietzsche's concept of resentment shares commonalities with schizophila. She offers Foucault and countless other theorists cultivated Nietzsche's commitment to suffering in their theories to challenge social norms and people with psychiatric illness were commonly portrayed as existential radicals resisting social power. For Bell's review of madness as protest see *Imagine Madness: Madness, Revolution, and Resentment and Critical Theory*.

¹⁴⁰ In liberal tradition people with serious mental disorders are described as being preoccupied with simple pleasure.

¹⁴¹ Mary Ann Glendon suggested economic man depicted as calculated and self-interested first emerged with Adam Smith and was perpetuated by his followers on page 69 in her book *Rights Talk*.

people with psychotic illness outside the social commons by presenting them as incapable of producing exchange value like the rest of society.^{142 143} He did this by embracing the underlying assumption that psychosis is genetic and debilitating through his analysis of the social relations of severely ill patients in psychiatric literature.¹⁴⁴ As a matter of course, dependence on cultural information¹⁴⁵ led the post-modern thinker to perpetuate the common sense belief unhealthy biology is natural advanced by Hobbes and Locke.¹⁴⁶ Like Freud earlier, Foucault blurred the line between the normal and pathological and forwarded mental illness as a universal and fixed product of society. However, in a new epistemological development, he argued "pathological reaction" formed the basis of reality^{147 148} and reduced individuals with psychosis to objects using mathematics that discovered shape in space.¹⁴⁹ Details cannot be provided here, but both classical and radical liberals defined neuropsychiatric disorders in terms of Locke's labour theory of

¹⁴² Self-reflection involves exchange with the external or internal environment and is prerequisite for mental development in liberal psychology. Liberal theorists denoted people with psychotic illness were incapable of intellectual exchange and becoming productive agents in the social world in various capacities.

¹⁴³ J.S. Mill provided in *Principles of Political Economy with Some of Their Applications to Social Philosophy* that the word Value always means value in exchange in political economy. For reference read Book III Chapter 1 section 111.1.4.

¹⁴⁴ Cultural hegemony has been maintained by narrowly focusing on liberal socio-political discourses along with the experience of chronically ill patients presented in hospital-based research in Western psychiatry. In a n added layer of complexity that must be acknowledged Anglophone research methodologies are used in Western and non-Western studies of psychotic illness. The lack of non-Western cultural representation in psychiatric research is a well recognized problem, which Jonathan Burns draws attention to in his study of poverty in first episode psychosis in South Africa. See "Dispelling a Myth: Developing World Poverty, Inequality, Violence and Social Fragmentation Are Not Good for Outcome in Schizophrenia".

¹⁴⁵ For a description of epigenetic transmission of cultural information see chapter 6 in *Evolution in Four Dimensions* by Eva Jablonka and Marion Lamb.

¹⁴⁶ In the conclusion of his book *Madness: The Invention of an Idea*, Foucault outlined reason ceased to be an ethic and became a nature and madness became a process alienating nature in the history of psychology. He also offered freedom was an inseparable essence of nature and that man at the level of being is both madness and freedom. Foucault advanced the idea of psychosis as intrinsically human, rather than an unnatural (or bestial) state to overcome the depiction of people with mental disorders as Other. Like Malthus and Freud, he expanded the early liberal concept of illness as a natural state, but entrenched it further by setting reason, madness, and freedom relationally in nature. Foucault's famous portrayal of madness as the twin of reason was a response to Descartes who he held struck madness from the realm of normative reasoning and production. His case against Descartes famously disputed as "structured totalitarianism" by Jacques Derrida can be found in chapter 2 (i.e. Cognito and the History of Madness) of Derrida's book *Writing and Difference*.

¹⁴⁷ Pamela Major-Poetzl, 147.

¹⁴⁸ Unlike Freud and other liberal theorists, Foucault held that the sick personality had its own unique structure characterized by spatial-temporal distortions and distorted perception. According to Pamela Major-Poetzl (on pages 108-110 of her book), however, Foucault did not question the concept of time underlying earlier evolutionary and historical perspectives. Instead, he accepted the coherence of traditional psychological theories, which is why we can see the historical depiction of psychosis as degeneration in his work.

¹⁴⁹ In a synthesis of rationalism and empiricism Immanuel Kant introduced time and space organized sense experience in his *Critique of Pure Reason*. In Kant's model thought was intrinsically governed by laws of physics, which Freud, Gaston Bachelard, and Foucault incorporated in their work in a critical interpretation. As a distinction, Freud developed a model of unconscious subject founded on Kant's Euclidian formula, while Bachelard and Foucault developed the non-Euclidian concepts of unreflective subject and constituted subject. For a review of the shift to non-Euclidian geometry founded on mathematical relations widely applied in 20th century see chapter 1 in *The New Scientific Spirit* by Bachelard.

value, and schizophrenia became emblematic of unproductive property in the history of capitalism.¹⁵⁰ In step with classical physics which grew out of Cartesianism¹⁵¹ the condition was used as a logical tool to create kinetic energy to drive the production of knowledge and justify the unequal distribution of power and wealth in liberal theory.¹⁵² Inappropriately, considering the fallout I will discuss later, psychosis in Western philosophy represents humankind's inherent incapacity to self-develop individuality, except for the select few predestined for freedom based on laws of reason.¹⁵³

HERV-W ECOLOGY OF PSYCHOSIS

From today's standpoint, we see defining psychotic illness externally through mathematics has generated a metaphysical monologue¹⁵⁴ and the untenable proposition that psychosis is untreatable. Worse, it has led to the systematic exclusion of individuals with psychosis (and by extension their families) from enjoying the benefits of citizenship in countries around the world. Considering the short-comings of Western market principles in the international economy and their wide application in science,¹⁵⁵ I echo several years after students in France who protested mathematics in economics as "an end in itself [*please*] deliver us from abstraction!"^{156 157} An answer to that call comes from

¹⁵⁰ People with schizophrenia were considered incapable of maximising utilities, or power identified as two key features of liberal democracy by C.B Macpherson in his "Essay on Democracy". In effect, they were amputated from liberalism's self-development plan.

¹⁵¹ Cartesianism is a rational philosophy developed by Rene Descartes who held that the mind and body are separate and knowledge is derived through reason from innate ideas, rather than sense experience. Isaac Newton's mechanical physics that introduced motion at a distance evolved from the work of Descartes who held motion occurred locally as a result of collision of objects. Euclid axioms were used by Descartes, Newton and others for grounding non-formal deductive geometrical reasoning. For more details read pages 72-78 in the book *Bachelard: Science and Objectivity* by Mary Tiles.

¹⁵² Mental disorders were forwarded as an object to act as a catalyst for the development of individual and group subjectivity in liberal socio-political theory. They were a starting point for historical (logical) opposition between reason and unreason.

¹⁵³ For Foucault, madness is a silent (internal) resistance to power and practicing resistance practices freedom, which is based on the classical liberal notion that what makes a person human is freedom from dependence on others. In his radical interpretation of liberalism, the thinker provided an intangible model of freedom. For a discussion on Foucault's ethics involving powerlessness of the subject to function in networks of power see "Foucault on Freedom and Capabilities" by Saul Tobias.

¹⁵⁴ I suggest the liberal historical discourse on psychosis is a fragmented monologue joined together by common scientific logic. Interestingly, Foucault depicted severe mental illness as a disconnected monologue like his strategic logic in contrast to youth with psychosis who present psychosis as fluid.

¹⁵⁵ In the book *Chimera and Consciousness* edited by Lynn Margulis and colleagues Dorian Sagan uses modern thermodynamic theory to argue purposeful human-like organized behaviour exists in nature.

¹⁵⁶ Ira Basen, "Economics Has Met The Enemy, and Its Economics." *The Globe and Mail* . October 18, 2011, 2-3.

neurovirologist Herve Perron and a growing number of other epigenetic scientists who introduced space and time limits into the study of schizophrenia.¹⁵⁸ Together, they are investigating the interplay of individuals with neuropsychiatric disease with the environment across the lifespan and discovered genes are only one indicator in mental pathology. This is significant because understanding the complex mechanisms involved helps to establish why people with brain disorders have been used to rationalize social inequality in history. More importantly, it assists with conceptualizing new models to guide international mental health policy, law, and practice.

Epigenome Eco-System

As an alternative to mechanical systems theory HERV-W research offers a synergistic model to explain schizophrenia, which shares common pathways with MS and cancer. An ecological framework that first emerged in the late 20th century helps make sense of psychosis by providing a conceptual base for an interdisciplinary approach to the study of the genome with the intent of preventing disability. Perron forwards the epigenome (as I recommend calling it despite restricted use in epigenetics)¹⁵⁹ is a highly plastic system where genetic viruses, human DNA and epigenes that determine traits in individuals intermingle with the environment to create a unified system of continuous genetic evolution.¹⁶⁰ Unlike classical and molecular quantitative genetics, gene expression does not occur in a vacuum, instead genetic material as an ecological

¹⁵⁷ 70 students at Harvard University walked out of their economics class in November 2011 to protest an overly conservative bias in the school's introductory economics course. Students were worried about how the bias affects them, the university and society.

¹⁵⁸ Early psychological interactive models of psychosis present space and time as separate, which reflects mechanical philosophy. Herve Perron introduces real-time in his model of schizophrenia as a distinction from other scientists.

¹⁵⁹ Epigenome is commonly described as the constellation of epigenetic marks on eukaryote cells.

¹⁶⁰ See "HERVs Expression in Autism Spectrum Disorders" by E. Balestrieri and colleagues for an evolutionary gene-environment model of Autism.

community¹⁶¹ of nearly 50% viruses contain copies that can be mobile, merge,^{162 163} and transcribe into proteins that control genes¹⁶⁴ and epigenetic regularity mechanisms.¹⁶⁵ Along with bacteria,¹⁶⁶ viruses and genes¹⁶⁷ are an integral part of cellular development,¹⁶⁸ which together provide the physical basis of hereditary.¹⁶⁹ As I will describe later, the evolving state of DNA structure involves triggering agents throughout an individual's life that shape Mendelian and epigenetic genes as part of its function.¹⁷⁰ Like a card game, where a player's hand changes as a result of interface with the all the cards and other players, genetic novelty is generated by the complex events between microbes and genes in their cellular and external milieu. The "fused system"¹⁷¹ actually forces the scientific community to rethink boundaries where phenotypic variation known to alter the risk of acquiring disease is mischaracterized as a "two track system of inheritance"¹⁷² that is only causally connected.^{173 174} It turns out, human endogenous

¹⁶¹ The epigenome can be compared to a symbiome advanced by Jan Sapp who describes every eukaryote is a complex community composed of chromosomal genes, organellar genes, bacterial symbionts and viruses. See *Genesis: The Evolution of Biology* (New York: Oxford University Press, 2003), 235.

¹⁶² Cedric Feschotte and Clement Gilbert, "Endogenous Viruses: Insights into Viral Evolution and Impact on Host Biology," *Nature Reviews* 13 (2012), 286-288.

¹⁶³ Raul Alelu-Paz and Iganacio Iturrieta-Zuazo, "Human Endogenous Retroviruses: Their Possible Role in the Molecular Etiology of the Schizophrenia", *Open Journal of Genetics* 2, no. 1 (2012), 71.

¹⁶⁴ David J. Lewkowicz, "The Biological Implausibility of the Nature-Nurture Dichotomy & What it Means for the Study of Infancy," *National Institute of Health*, 2011, 334-335.

¹⁶⁵ Cedric Feschotte and Clement Gilbert, 289.

¹⁶⁶ Scott F. Gilbert, *Transformations of Lamarckism: From Subtle Fluids to Molecular Biology*, eds. Snait Gissis and Eva Jablonka (Cambridge: The MIT Press, 2011), 285-286.

¹⁶⁷ David J. Lewkowicz outlines genes are an embedded part of development on page 336 in his article cited in footnote 165.

¹⁶⁸ Many genes require a particular combination of environmental signals and activation factors, which influences their expression pattern. This highlights that genes and development are inseparable.

¹⁶⁹ In *Transformations of Lamarckism* on pages 303-305 Snait Gissis and Eva Jablonka summarize Ehud Lamm's depiction of the genome as a unified genetic-epigenetic system, which is responsive to ecological or genomic stress defined in terms of organizational responses. They outline Lamm's concept of genomic plasticity that links DNA and development, but does not include modifiable viral DNA as a part of an inheritance system. The emerging field of paleovirology challenges geneticists and epigeneticists to rethink heredity concepts.

¹⁷⁰ Cedric Feschotte and Clement Gilbert, 289, 291-292

¹⁷¹ In agreement with Herve Perron's depiction of unified evolving DNA structure David J. Lewkowicz posits in a critique on the nature/nurture dichotomy in the field of genetics that organisms are involved in continuous dynamic interplay with the environment. He provides that genes function in the context of reciprocal internal and external environmental interactions and coined the term 'fused system' to explain the complex cascade like process that determines the structure and function of genes. As a distinction, Lewkowicz's model does not consider HERV's and their role in the genetic system. For more details see "The Biological Implausibility of the Nature-Nurture Dichotomy & What it Means for the Study of Infancy".

¹⁷² Christina L. Richards, Oliver Bossdorf and Massimo Pigliucci. "What Role Does Heritable Epigenetic Variation Play in Phenotypic Evolution?" *Bioscience* 60, no. 3 (2010), 235.

¹⁷³ Michel Morange verifies in "How Phenotypic Plasticity Made Its Way Into Molecular Biology" Mendel selected plants and data that fitted his laws, therefore, he 'selected out' phenotypic plasticity from his gene experiments. In *Evolution in Four Dimensions on*

retroviruses may be the missing link between genotypic and phenotypic inheritance, since ancient retroviruses are stimulated indirectly and directly by the environment and regulate epigenetics through a self-sustaining feedback loop. Perron shows viral genes are activated by exogenous viruses and compounded by epigenetic changes to phenotype cellular structures,¹⁷⁵ which in turn induce further alterations to epigenes and switch on genes in HERV-W related disorders.¹⁷⁶ To complete the cycle phenotype changes¹⁷⁷ and co-viral exposures over a lifetime promote chronic activation of HERV-W translating into disease flare-ups for patients.¹⁷⁸ When you add recombining and moving viral genetic elements to the mix,¹⁷⁹ the epigenome functions as a responsive "super-organism system of inheritance"¹⁸⁰ where cultural signals are passed on from parents to offspring as a unit of information and persist over several generations.¹⁸¹

pages 373-374 Eva Jablonka and Marion Lamb argue it is necessary to tease apart various hereditary and developmental systems before integrating them, but do not offer an integrated theory of inheritance.

¹⁷⁴ Environmental epigenetics has changed the current definition of heritability to include environmentally mediated changes to the (classic) epigenome that are retained following mitosis, meiosis, single generation inheritance and multigenerational inheritance despite the absence of direct inciting environmental events. See section 15 in "Epigenetic Principles and Mechanisms Underlying Nervous System Functions in Health and Disease" by Mark F. Mehler.

¹⁷⁵ In epigenetics phenotype changes can occur several ways including through cell division where genes are switched on based on the 1) history of ancestors and by 2) alterations to germ line chromatin structures. Chromatin as a vehicle for epigenetic variation and inheritance is widely studied and involves histone proteins, which facilitate chemical reactions in the body. Altered methylation which is a part of chromatin can produce disease by destabilizing genes. DNA methylation is a key factor in HERV-W related diseases, since it suppresses the expression of viral proteins.

¹⁷⁶ Wenjie Huang et al, "Implication of the env Gene of the Human Endogenous Retrovirus W Family in the Expression of BDNF and DRD3 and Development of Recent-Onset Schizophrenia," *Schizophrenia Bulletin* (2010), 11.

¹⁷⁷ Ehud Lamm records on page 350 in *Transformations of Lamarckism* that pathogen attacks can cause small scale changes genomic changes and wider genomic repatterning. Herve Perron introduces exogenous pathogens affect HERV-W viral DNA directly and causes large morphological epigenomic changes and genomic repatterning.

¹⁷⁸ Antonina Dolei and Herve Perron describe a parallel pathogenic feedback loop in MS where virus release is unregulated by proinflammatory cytokines, which in turn is overproduced in response to MSRV (HERV-W) and correlates with disease severity. See page 7 in their article "The Multiple Sclerosis-Associated Retrovirus and Its HERV-W Endogenous Family: A Biological Interface Between Virology, Genetics, and Immunology in Human Physiology and Disease".

¹⁷⁹ For a n easy to read primer on mobile genetic elements that move DNA around the cell's epigenome and add to its flexibility see "What Makes Each Brain Unique" on page 26 in the March 2012 issue of *Scientific American* magazine.

¹⁸⁰ In symbiogenetics it is recognized that new states of order in plants can occur on the level of genes through symbiosis and interaction with the environment. Epigenetics is thought to play a key role in adjusting coding systems of hereditary in an ongoing process of reorganization of the genetic system. Similar processes are involved in human inheritance, however, HERV-W research reveals the environment also causes direct changes to viral DNA and modifies genetics, which is then inherited. In a synthesis of evolving gene concepts the epigenome can be described as a single interdependent complex that realizes genetic environmental information.

¹⁸¹ In "The Multiple Sclerosis-Associated Retrovirus and its HERV-W Endogenous Family: A Biological Interface Between Virology, Genetics, and Immunology in Human Physiology and Disease" on page 5 HERV-W is described as consisting of several families and copies on chromosomes that can recombine to produce new variants. Also, viral fragments integrate in the genome and these are said to be important non-Mendelian genetic rules that help to understand HERV-W biology.

The molecular interplay involved in genetic and epigenetic inheritance is complicated and is still developing, so attempts to update parameters are ongoing. Still, we can see gene theory has reached a new synthesis and that this represents a major shift in science.¹⁸² In support of my thesis, a situation now exists where scientific knowledge has outsized Western values and theories and the systems informed by them require reevaluating and restructuring.¹⁸³ Change of course is welcome considering the historical discourse on psychosis has remained qualitatively static for 350 years. As I pointed out, Western scientists categorized individuals with psychotic illness as largely incapable of mental growth though external and internal processes of exchange with the world. Naively, in view of gene-environment interface research, in genetic texts the afflicted are regarded as "repetitive life histories" analogous to the gradually forming concept of the gene as the blueprint of hereditary.¹⁸⁴ As a reminder of the perils of reductionism, Perron established humans are universally open to environmental inputs and change and that the environment is susceptible to influence and modification in return. In his organic system, disease occurs at different rates in people and can be modified, since HERV-W and epigenes operate interdependently and adds to the epigenomes plasticity.¹⁸⁵ In agreement with modern thermodynamic theory schizophrenia is time reversible¹⁸⁶ and that is a game changer in genetics and epigenetics as well as for those coping with the disease.

¹⁸² The study of phenotypes in schizophrenia has shifted to the (viral) gene from the diagnostic level of behaviour, which is transformative in psychiatric genetics. For a brief on phenotype definition see page 14-17 in *Psychiatric Genetics: Methods and Reviews* edited by Marion Leboyer and Frank Bellivier.

¹⁸³ Based on emerging HERV-W concepts in the new era of systems biology a conceptual model has emerged with sufficient explanatory power to supersede the old paradigm rooted in ideology in psychiatry. For a historical review of paradigms in psychiatry see "Paradigm Failure in Functional Psychosis: Review and Implications" by Patrick McGorry.

¹⁸⁴ The phrase repetitive life histories was coined by F.R. Little and denotes the narrow depiction of heredity by geneticists according to Jan Sapp. For reference see page 139 in *Genesis: The Evolution of Biology*.

¹⁸⁵ Herve Perron and Alois Lang, 5-6.

¹⁸⁶ Living organisms are not closed mechanical systems, so the single arrow of time depicted by the 2nd law of thermodynamics does not apply.

HERV-W Microevolution

The "homebody"¹⁸⁷ retrovirus involved in human reproduction by forming placenta in pregnancy, and conceivably assisting in the development of human language and cognition¹⁸⁸ closes the gap between the genotype and phenotype presented as separate in epigenetics. It also equalizes the classes depicted by liberal psychology, since it reveals difference in mental development is set in physiology and exists on a normal continuum. Schizophrenia can be understood as a coherent response to changes in the brain that occur from dynamic interplay between biology and culture, rather than a genetic trait prone to deviation, or retreat from social norms. This is important and I hope others are convinced because it helps to understand the genesis of some types of psychiatric illness and may provide clues to others. As a primer, HERV-W genes mediate cell fusion in the evolution of placenta which helps feed, oxygenate, and provide immune protection to an embryo during a woman's pregnancy.¹⁸⁹ HERV-W generates phenotype variation beginning in the perinatal period and altered expression in placental cells^{190 191} contributes to pre-eclampsia^{192 193} and increased risk of schizophrenia in fetuses in susceptible individuals.¹⁹⁴ In a "chain reaction"¹⁹⁵ process infection with influenza identified as a

¹⁸⁷ Journalist Douglas Fox wrote an article entitled the "Insanity Virus" in the June 2010 issue of *Discover* magazine where he coined the term homebody retrovirus to depict HERV-W's integration into human DNA.

¹⁸⁸ Luis Villareal, "Can Viruses Make Us Human?" *JSTOR* 148, no. 3 (2004), 318.

¹⁸⁹ For a synopsis of the role of HERV-W in pregnancy see "A Virus for Life" by Vivienne Gerritson at web.expasy.org/spotlight/back_issues/050/

¹⁹⁰ X Lee et al, "Downregulation of Placental Syncytin Expression and Abnormal Protein Localization in Pre-eclampsia." *Placenta* 22, no. 10 (2001), 811.

¹⁹¹ Hypoxia has been found to reduce HERV-W (syncytin 1) in placenta and HERV researchers have demonstrated the flu virus alters expression as well. The finding establishes environmental viruses may cause pre-eclampsia. For a study on the impact of influenza A virus on HERV-W genes see "Transactivation of Elements in the Human Endogenous Retrovirus W Family by Viral Infection" by Christoffer Nellaker and colleagues.

¹⁹² BS. Holder, CL. Tower, VM. Abrahams, and JD. Aplin, "Syncytin 1 in the Human Placenta." *Placenta* 33, no. 6 (2012), 460-6.

¹⁹³ A. Vargus and colleagues posit HERV-W and HERV-FRD renamed syncytin 1 and 2 indicates severity of pre-eclampsia and can be used as markers for early diagnosis. See abstract "Reduced Expression of Both Syncytin 1 and Syncytin 2 Correlates with Severity of Pre-eclampsia" at www.ncbi.nlm.nih.gov/pubmed/21493955

¹⁹⁴ R.H. Yolken et al, *Retrotransposition, Diversity and the Brain*. Eds. F.H. Gage and Y. Christen (Berlin: Springer, 2008), 66,68.

¹⁹⁵ In MS Herve Perron explains a chain reaction cascade occurs where infectious events in different periods of life provide critical components for future pathogenic interactions. See figure 3 in "Microbial Agents Triggering Endogenous Retroviruses with Genetic Susceptibility Loci with Expression of Superantigen and Gliotoxic Molecules: A Plausible "Immuno-virogenetic" Cascade Causing Multiple Sclerosis."

major risk factor in schizophrenia¹⁹⁶ immediately before and after a child's birth activates normally silent HERV-W.¹⁹⁷ DNA is not heavily methylated at this point, so a fetus or newborn infant's viral genes are modified by environmental viruses through genetic shuffling and copies are inserted into DNA setting up future vulnerability.¹⁹⁸ To complicate matters, the infecting agent Herpes Virus type 2 can be passed onto children during pregnancy by mothers and activate HERV-W later in life.^{199 200} These findings are significant, since they confirm epigenetic pathways are involved in psychotic disorders and HERV-W operates synergistically with the environment and chromosome genes as part of an integrated system.²⁰¹

In the epigenome latency is the rule for HERV-W,²⁰² but in the development course marked by critical periods environmental viruses trigger HERV-W protein production and act as an "immunotoxin" and initiate an innate immune "pro-inflammatory" response that causes glial cell death.^{203 204 205} According to Perron and colleagues viral infections during childhood and adulthood are secondary risk factors that intrude across the blood brain barrier to elicit the process through HERV-W activation.²⁰⁶ In multiple sclerosis a "hit and run" scenario occurs where viral co-factors induce HERV-W protein secretion

¹⁹⁶ Marion Leboyer, "Human Endogenous Retrovirus Type W (HERV-W) in Schizophrenia: A New Avenue of Research at the Gene-Environment Interface," *The World Journal of Biological Psychiatry* (2001), 6.

¹⁹⁷ Herve Perron and Alois Lang, 5.

¹⁹⁸ Herve Perron et al, 1022.

¹⁹⁹ Herpes Virus 2 is commonly known as genital herpes. The sexually transmitted infection can be considered an endogenized environmental risk factor when it is passed onto offspring during pregnancy.

²⁰⁰ Marion Leboyer et al, 7.

²⁰¹ WenJie Huang et al, "Implication of the Env Gene of the Human Endogenous Retrovirus W Family in the Expression of BDNF and DRD3 and Development of Recent-Onset Schizophrenia," *Schizophrenia Bulletin* (2010), 11.

²⁰² According to Cedric Feschotte and Clement Gilbert in "Endogenous Viruses: Insights Into Viral Evolution and Impact on Host Biology" ERV insertions are silenced in embryonic and adult tissues through repressive epigenetic marks. Failure to maintain or contain the marks can lead to waves of infection and perturb local gene expression. See page 289.

²⁰³ Herve Perron et al, "Endogenous Retrovirus Type W GAG Envelope Protein Antigenemia in Serum of Schizophrenic Patients," *Biological Psychiatry* (2008), 1021-1022.

²⁰⁴ Joseph M. Antony et al, "Human Endogenous Retroviruses and Multiple Sclerosis: Innocent Bystanders of Disease Determinants?" *Biochimica et Biophysica (BBA) Molecular Basis of Disease* 1812 (2011).

²⁰⁵ The central nervous system consists of about half neurons and glial cells make up the rest. Glial cells provide support and protection for neurons.

²⁰⁶ Herve Perron posits that whether a person develops MS or schizophrenia is determined by the immune systems response to HERV-W.

and then are barely detectable after the early infection phase.²⁰⁷ What is measurable and associated with disease severity in MS and schizophrenia is the overall load of HERV-W, which is the target of detection and treatment strategies. As a critical point it is suggested environmental factors act as a catalyst and determine the progression of neuroinflammatory disorders, while genes are involved in the control of inflammatory immune responses.²⁰⁸ This is identified as a bridge to explain the trajectory of chronic illness that persists in youth with first-episode psychosis, for example, despite early diagnosis and treatment.²⁰⁹

Reconceptualising Stress in the New Ecology

In the HERV-W ecosystem, internal and external environmental factors mingle on multiple levels during a person's lifespan and through genetic reshuffling and Mendelian inheritance generates variation in schizophrenia. There are several internal factors like immunological disturbances,²¹⁰ immune genes, hormones,²¹¹ and two X chromosomes in women that doubles risk for HERV-W related disease.²¹² External factors include spring-winter births, maternal infections, urban environments, and stress. Stress is a major epigenetic modifier because it is involved in triggering perinatal risks and inducing first-episode psychosis by expressing HERV-W near neuronal cells. In addition, episodic and chronic illness is caused by repeated stress exposures that stimulate HERV-W and viral

²⁰⁷ Herve Perron et al., 3.

²⁰⁸ Marion Leboyer et al, 2.

²⁰⁹ In 2007 a study at the EPPIC early psychosis program in Melbourne, Australia led by Henry Harris determined the prevalence of psychotic disorder was higher in schizophrenia than other forms of first-episode psychosis. In a sample of 765 first episode psychosis patients after ten years 49% were reportedly never actively psychotic, 31.6 experienced a continuous course of illness, and 17.1 suffered episodic illness while 2.2% had neither continuous, nor episodic illness.

²¹⁰ For details on the role of autoimmunity in schizophrenia defined in terms of interplay between pathogens, genes and the immune system see C.J Carter's research article entitled "Schizophrenia: A Pathogenic Autoimmune Disease Caused by Viruses and Pathogens and Dependent on Genes", *Journal of Pathogens*, 2011.

²¹¹ Ignacio Iturrieta and Raul Alelu-Paz, "Human Endogenous Retroviruses, Hormones and APOBEC3G: A Connection to Explore in Schizophrenia," *BioScience Hypotheses* 2,(2009).

²¹² Herve Perron et al, "Endogenous Retroviral Genes, Herpesviruses and Gender in Multiple Sclerosis," *Journal of Neurological Science* (2009), 6.

co-factors latent in organs in the body.²¹³ In a positive feedback cycle like epigenetic inheritance stress damages DNA cellular structures^{214 215} and produces more stress across all levels of development, which translates into poor health. Typically, stress is segregated into biological and psychological forms,²¹⁶ but it is increasingly recognized a range of environmental stimulation targets the brain²¹⁷ through common pathways and plays a major role in neuroinflammation.^{218 219} As a result, stress can be characterized as the total internal and external biological and psychological environmental load on a person.²²⁰ Stress at the gene-environment interface is conceptualized in terms of accumulated mass²²¹ to understand its pathogenic potential similar to the secreted load of HERV-W in MS.^{222 223} Offering support various studies indicate viruses, injury, hormones, poor nutrition, and emotional trauma²²⁴ all promote deregulation of HERV-W by altering the chemical balance of DNA.²²⁵ A major qualification to bear in mind is

²¹³ Marion Leboyer et al, 8.

²¹⁴ Mark F. Mehler reports in "Epigenetic Principles and Mechanism Underlying Nervous System Functions in Health and Disease" that genome-wide psychosis-associated methylation abnormalities in the frontal cortex affects gene involved in glutamatergic and GABAergic neurotransmission, brain development, mitochondrial function and stress responses.

²¹⁵ Herve Perron advances exogenous viruses affects epigenome homeostasis by activating HERV-W through chromatin alternations that are involved in silencing viral DNA.

²¹⁶ Accumulated environmental wear and tear on a person created by stress is defined as allostatic load and involves neurobehavioural systems and psychological mechanisms, but is typically described in psychosocial terms according to John Cacioppo who is one of the founders of the field of social neuroscience from the University of Chicago.

²¹⁷ The brain is a target for stress and stress hormones and changes the structures of neurons. For information on non-viral mechanisms involved in stress see "Physiology and Neurobiology of Stress and Adaptation: Central Role of the Brain" by Bruce McEwen.

²¹⁸ Marion Leboyer and David Kruper, "Bipolar Disorder: New Perspectives in Health Care and Prevention," *The Journal of Clinical Psychiatry* 71 (2010), 13-14.

²¹⁹ Stress is thought to play a key role in producing neuroinflammation in schizophrenia, bi-polar disorder, Alzheimer's, Parkinson's disease and ALS among other diseases.

²²⁰ Ehud Lamm presents a unified model of stress on page 350 in *Transformations of Lamarckism*. He posits since the genome is highly metastable stress can be considered anything that disturbs stable states. Homeostatic mechanisms such as histone replacement and maintenance of small RNA's are said to be constantly under pressure to retain stability.

²²¹ Stress can be thought of as compounding through a multistep process involving internal and external environmental factors similar to the development of HERV-W related schizophrenia. A critical threshold is reached depending on environmental factors and modifiers (eg. exercise, nutrition, improved living conditions, medication, psychological support) that inhibit stress in a person. I use the term environmental load to describe the total stress on a person.

²²² Herve Perron et al, 3.

²²³ When HERV-W reaches critical mass it sets off a cascade of immunological events that causes MS and schizophrenia.

²²⁴ For additional information on the role of stress signals in HERVs see "Endogenous Retroviruses in Systematic Response to Stress Signals" by Kiho Cho and colleagues.

²²⁵ Herve Perron and Alois Lang explain HERV-W elements are normally silenced by epigenetic mechanisms such as DNA methylation and supercoiled conformation. They forward viruses can activate HERV-W copies and cause demethylation of target genes, which make them responsive to transactivating molecules. For details see "The Human Endogenous Retrovirus Link Between Genes and Environment in Multiple Sclerosis and in Multifactorial Diseases Associating Neuroinflammation".

environmental stressors are not alike.²²⁶ Viruses act as an accelerant disturbing cellular homeostasis in neurodegenerative and psychiatric diseases,²²⁷ which is key to understanding HERV-W ecology.

Niche Construction in First Episode Psychosis

By learning the complexity of intercellular processes and eliminating the synthetic break between body and mind in Western psychology we can begin to discover differences in schizophrenia and learn strategies to promote recovery.²²⁸ Offering clues non-protein encoding RNA communicate with other molecules to control their activities and coordinate their actions in the cellular microenvironment.²²⁹ On the macro level, niche construction shapes evolutionary processes in the disease through a system wide signalling network. To explain niche construction the term " refers to a process by which organisms, through their metabolism, physiology, behaviour, and dispersal, casually affect abiotic and biotic features of their environments."²³⁰ ²³¹ It entails reciprocal influence of the environment on organisms through feedback from the population to produce traits. What this means is individuals susceptible to neuropsychiatric illness are open to environmental inputs and a variety of states of health. Far from passive receptacles depicted in history as incapable of producing kinetic energy for mental growth, or failing to adapt to the environment, affected individuals are conduits of

²²⁶ The central nervous system inflammatory factor Interleukin-1 (IL-1) is particularly inducible to stress, but not all stressors increase expression of IL-1. According to Terrence Deak, simple restraint of rats had no effect, while exposure to footstock, tail shock or immobilization created a profound increase in hypothalamic IL-1. See page 100 in "From Classic Aspects of Stress Response to Neuroinflammation and Sickness: Implications for Individual and Offspring".

²²⁸ Herve Perron defines stress by its pathogenic activation of HERV-W in relation to changes to epigenome mechanisms and DNA structures. Viruses are known to influence viral DNA directly and modify/control epigenetics, which increases epigenome instability.

²²⁸ Recovery is an ambiguous term in psychiatry. It can mean anything from short-term to long-term remission of first rank symptoms of psychosis, improved social and employment functioning, ability to live independently, or feeling of satisfaction with one's life. I use the term to denote health and ability to participate in economic, social, and cultural life.

²²⁹ Marcel E. Dinger, Timothy R. Mercer, and John S. Mattick, "RNAs as Extracellular Signalling Molecules," *Journal of Molecular Endocrinology* 40, 2008, 151-159.

²³⁰ Abiotic refers to non-living things like water, temperature and gasses whereas biotic denotes living things like stress, soil, bacteria and viruses. Biotic components shape an eco-system and can be depicted as consumers, producers, and decomposers.

²³¹ Ayelet Shavit and James Griesemer, *Transformation in Lamarckism: From Subtle Fluids to Molecular Biology*, eds. Snaith B. Gissis and Eva Jablonka (Cambridge: The MIT Press (2011), 307.

change. It is universal that "all living creatures through their metabolism, their activities, and their choices, partly create and partly destroy their own niches, on scales ranging from extremely local to the global."²³² First episode psychosis youth are highly receptive to culture as a result of inherited and ongoing environmental modifications to cellular chemicals and HERV-W, which directs and restricts their choices and adds complexity to their internal and external environment. One young woman stated as her psychosis came and went so did insight into her health²³³ and serves as a warning against assuming schizophrenia is an isolated, or closed system as socio-political theorists hypothesized.

Macroenvironment and Recovery

To explain niche construction concretely, a young adult in remission from early onset psychosis shares graphs that illustrate the impact of culture on her health during critical social development phases from 12 to 30 years old (Table 1). In the first-person data she depicts stressors associated with the onset of psychosis and early psychosis care did not completely resolve her symptoms and initiated divergence from an expected path of development. In the critical years of production and reproduction several overlapping social factors led to further derailment of her life course. She reports a sequence of events such as high university debt due to inadequate funding, a lack of drug coverage, moving overseas to work, discrimination at a job interview, and instability in her living conditions due to unemployment and underemployment created a 5x greater complication in life in her late 20's (Table 2). What the charts reveal is culture is directly involved in first-episode psychosis and the liberal market economy does not distribute resources

²³² F. John Odling-Smee, Kevin N. Laland and Marcus W. Feldman, *Niche Construction: The Neglected Process in Evolution* (New Jersey: Princeton University Press, 2003), 1.

²³³ Sandra Yuen Mackay, *My Schizophrenic Life* (Ontario: Bridgecross Communications, 2010), 95.

equitably or functionally.²³⁴ More specifically, they demonstrate that socio-economic and political stressors build up to increase risk of relapse,²³⁵ ²³⁶ especially in individuals with HERV-W related psychiatric disorders.

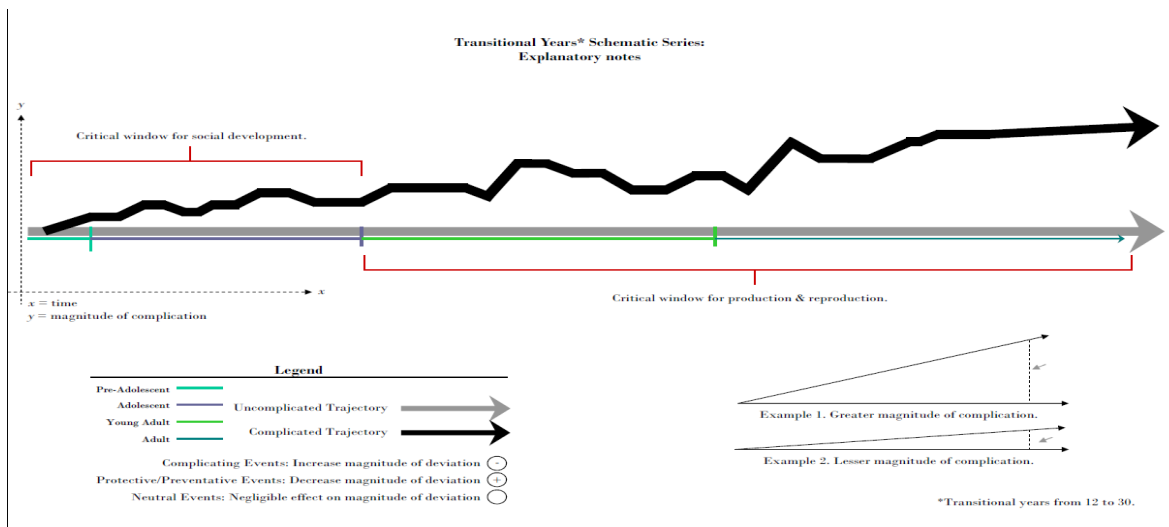


Table 1

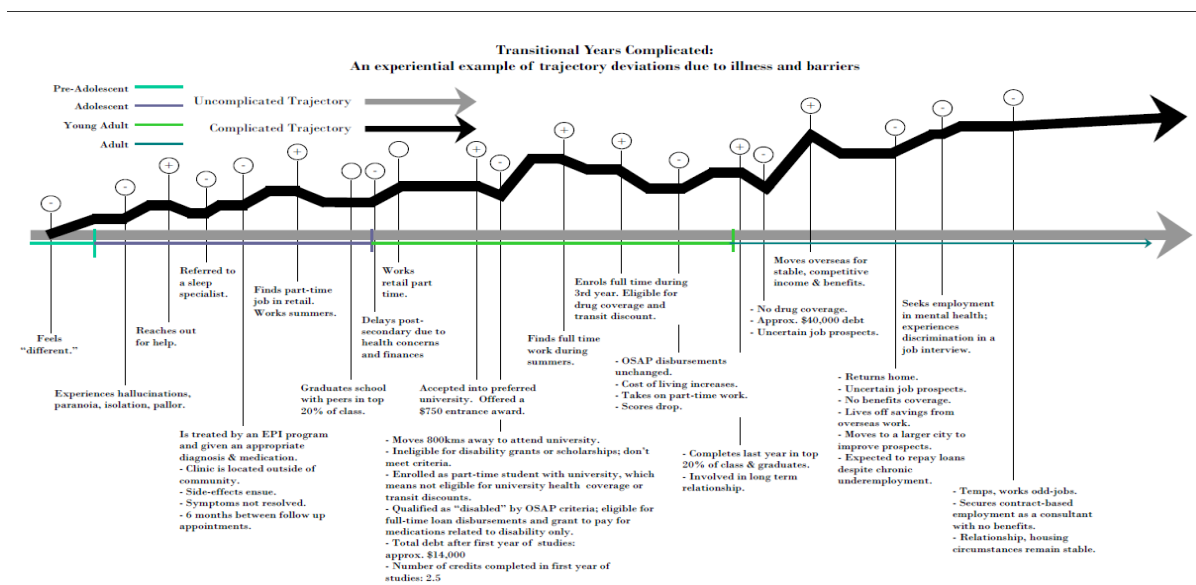


Table 2

²³⁴ The graphs verify C.B. Macpherson's claim in chapter 1 of his book *Democratic Theory: Essays in Retrieval* that the capitalist market economy does not maximize utilities equitably according to work, or need.

²³⁵ Richard Warner, *Recovery From Schizophrenia: Psychiatry and Political Economy*, 3rd ed. (Hove: Brunner-Routledge, 2004), 140-141.

²³⁶ Financial strain due to unemployment is a well known to impact psychiatric health negatively. According to researchers in Sweden a lack of knowledge of the impact of financial strain on first-episode psychosis needs to be addressed. See "Association Between Financial Strain, Social Network and Five Year recovery from First-Episode Schizophrenia" by Maria Mattson et al.

In agreement with HERV-W research, the self-reported recovery indicators effectively depict the environment plays an important role in disease, which is validated by a multitude of formal studies. A recent comparative study between Australia and Canada found labour market policies and unemployment uncertainty in the 1990's and early 2000's led to poor mental health among young people, and Australian youth were affected the most, since they had to negotiate their own working conditions.²³⁷ An ecological study from South Africa revealed social, economic, and political factors such as poverty and income inequality contribute to the risk of developing psychosis and the context healthcare is provided. The authors made the distinction psychosocial interpretations of income equality focus on the perception of inequality, rather than material conditions the recovery graphs suggest is associated with uneven and unequal development.^{238 239} The difference in poverty criteria is highly relevant because epigenetics reveals biological elements of culture such as viruses linked to housing overcrowding²⁴⁰ and famine during pregnancy increases the risk of schizophrenia.²⁴¹ Psychosocial stresses are also epigenetic modifiers, but ignoring material conditions of health neglects underlying causes and a person's ability to cope with secondary stress related to the disorder.^{242 243} As a consequence the status-quo signified by poor long-term

²³⁷ Johanna Wyn and Lesley Andres, "Navigation Complex Lives: A Longitudinal, Comparative Perspective on Young People's Trajectories," *Early Intervention in Psychiatry* 5 (2011), 17, 19.

²³⁸ Jonathan K Burns and Tonya Esterhuizen, "Poverty, Inequality and the Treated Incidence of First-Episode Psychosis," *Social Psychiatry Psychiatric Epidemiology* (2008) 331-335.

²³⁹ Jonathon Burns and his colleague provide first episode psychosis was highest in the most deprived neighbourhoods.

²⁴⁰ Herve Perron et al, "Endogenous Retrovirus Type W GAG and Envelope Protein Antigenemia in Serum of Schizophrenic Patients," *Biological Psychiatry* (2008), 1019.

²⁴¹ Bart P. F. Rutten and Jonathan Mill, "Epigenetic Mediation of Environmental Influence in Major Psychotic Disorders," *Schizophrenia Bulletin* 35 (2009), 150.

²⁴² Melvin Kohn offers in his article "Social Class and Schizophrenia: A Critical Review and a Reformulation" the lower classes do not have enough money or power to mitigate the consequences of stress.

²⁴³ The high incidence of diabetes due to changes in traditional diet and lifestyle among aboriginals as well as the work of the Aboriginal Healing Foundation regarding the health impacts of residential schools on Canada's aboriginal population confirms the role of physical and psychosocial stress in health.

recovery gets perpetuated when there is desperate need for strategies to deal effectively with psychotic illness around the world.

Acknowledging Families in HERV-W Ecology

Interestingly, due to the international trend of governments downloading caregiving responsibilities onto families,²⁴⁴ Jonathan Burns from the Nelson Mandela school of Medicine who co-authored the paper on poverty above disagrees with the World Health Organization's depiction of families as intact and providing economic and social empowerment to ill relatives in developing countries. He provides disability and social outcome are the worst in China, Brazil and Ethiopia, and is associated with high levels of poverty, poor mental health services, and stress among other factors.²⁴⁵ I propose poverty makes psychosis difficult for families to manage even in developed nations, especially when confounded by intergenerational schizophrenia, parental disability,²⁴⁶ stigma and discrimination,²⁴⁷ and inadequate social and legal support.²⁴⁸ At a Canadian early psychosis workshop a parent receiving disability benefits indicated that multiple oppressions depleted scarce resources and caused economic and social marginalization,²⁴⁹ which led to intense feelings of pressure. The burden of psychotic disorders on families

²⁴⁴ Families have become nurse-extenders in the care for children with serious psychiatric disease and elderly parents in North America. In China as a part of market -based mental health reform, families are being allocated a greater role in care giving for ill relatives as well.

²⁴⁵ Dr. J. Burns, "Dispelling a Myth: Developing World Poverty, Inequality, Violence and Social Fragmentation are Not Good For Outcome in Schizophrenia," *African Journal of Psychiatry* (2009), 201-202.

²⁴⁶For a discussion on parental disability see Paul Preston Ph. D., "Parents with Disabilities," *International Encyclopaedia of Rehabilitation*. See cirrie.buffalo.edu/encyclopedia/en/article.

²⁴⁷ Stigma is widespread in many countries around the world, but occurs in local cultural context. Some argue that stigma in non-Western cultures was transported across the world as part of the Western psychiatric model. In China shame face concepts based on Confucianism prevent rural families from seeking help for ill relatives with psychosis, however. For a general discussion on stigma in Asia see "Stigma Towards People with Mental Illness in Developing Countries in Asia" by Christoph Laaber and Wulf Rossler.

²⁴⁸ The Royal College of Psychiatrists reports people with multiple disadvantages are most at risk of poverty and social exclusion, which indicates poverty can create a feedback loop that perpetuates illness and marginalization. See page 6 in *Mental Health and Social Inclusion: Making Psychiatry and Mental Health Services Fit for the 21st Century*.

²⁴⁹ Michelle funk et al reported on page 58 in "A Framework for Mental Health Policy, Legislation and Service Development: Addressing Needs and Improving Services" that mental ill-health and poverty are inextricably linked. They outlined mental ill- health often exacerbates poverty among affected individuals and their family carers.

is not routinely assessed or reported,²⁵⁰ but a recent best-practice study revealed that caregivers of first-episode youth in Hawaii required respite care due to burnout. In addition, eight out of ten caregivers in the *Burdens and Difficulties Experienced by Caregivers of Children and Adolescents with Schizophrenia-Spectrum Disorders: A Qualitative Study* felt services were inaccessible and inappropriate among those represented and contributed to their psychological crisis.²⁵¹ Researchers recommended better family care plans as a solution. However, based on ecological studies and first-person information, I suggest doing a better job of preventing psychosis by improving the conditions of peoples lives and developing safe effective therapies at the same time.

TRANSLATING HERV-W RESEARCH

To illustrate the limitations of psychological approaches in the treatment of psychotic disorders it is worth looking at early psychosis intervention introduced in Melbourne, Australia in the early 1990's that spread to cities around the world.²⁵² In a brief review, as an alternative to traditional mental health care that defines schizophrenia by its end state,²⁵³ Patrick McGorry and his colleagues at the Early Psychosis Prevention and Intervention Centre (EPPIC), in Melbourne, developed a staging system that lumped several psychotic disorders together and divided them into three basic groups: ultra high risk, first-episode, and critical phase.^{254 255 256} Comparable to other liberal expansions,²⁵⁷

²⁵⁰ There is currently no assessment of needs of families at mental health treatment programs for psychotic disorders in Ontario, Canada.

²⁵¹ Jane Knock et al, "Burdens and Difficulties Experienced by Caregivers of Children and Adolescents With Schizophrenia-Spectrum Disorders: A Qualitative Study," *Early Intervention in Psychiatry* 5, no. 4 (2011), 349-353.

²⁵² There are centralized and decentralized models of early psychosis services to meet the needs of urban and rural populations. There is also ongoing efforts to culturally adapt the models in countries around the world, although this has been met with limited success. Integration of holistic Indigenous and Chinese healing approaches, for example, is not an integral part of the approaches.

²⁵³ Emil Kraepelin developed the dichotomous gene-centric classification system for psychotic illness, which segregated schizophrenia from manic depression and defined the disorder as progressively deteriorating. His model informs the American Psychiatric Association's DSM-IV manual and World Health Organization's classification system for disease.

²⁵⁴ Patrick McGorry, Eoin Killackey, and Alison Young. "Early Intervention in Psychosis: Concepts, Evidence and Future Directions," *World Psychiatry* 7 (2008), 151-155.

²⁵⁵ McGorry and colleagues provide defining stages according to progression of disease creates a prevention oriented framework that requires understanding of social, biological and personal risk factors, which influence one stage to the next.

a shift to development processes was devised and diseases sharing common qualities were reorganized into a universal system and sub-categorized according to symptoms along a linear continuum.²⁵⁸ As an end product, schizophrenia was reduced to "one sub-type of psychotic disorder outcome, admittedly a major one among a small range of distal targets."²⁵⁹ According to McGorry the shift from disease to the patient's psychopathological state is a major strategy to reduce morbidity and mortality and the false perception people with schizophrenia cannot recover.²⁶⁰ It is argued if clinicians identify and treat psychosis early before a coherent disease pattern emerges,²⁶¹ they can prevent mental deterioration and disability.²⁶² More generally, targeting mental health risk in young people is believed to reduce the total burden of mental pathology in society.²⁶³

In support of the claim, culture is a system of evolving "socially transmitted patterns, preferences, and products..., "²⁶⁴ the modern reduction in psychiatry moved to the

²⁵⁶ It is worth noting the new staging model de-emphasised first rank symptoms of psychosis, which includes hallucinations, delusions and disorganized thinking. Focus has shifted to negative symptoms such as social withdrawal and apathy that are common to several mental disorders to facilitate earlier diagnosis.

²⁵⁷ Neo-Darwinian classification systems are identifiable by their hierarchal expansion of individual phenomena to groups and focus on genes as the only units of heredity. This is seen across the sciences and is represented in evolution theory in the work of Stephan Jay Gould. For details on Gould's expansion of Darwinism see pages 24-27 in "Confronting the Enigma of Revolution."

²⁵⁸ Patrick McGorry and Jan Olav Johannessen from the university hospital in Stavanger, Norway support a progressive psychological view of psychotic disorders. They believe psychosis emerges from general behavioural symptoms, therefore, the high risk category in the early psychosis staging system should capture more general risk of serious mental disorder. McGorry was a leading force behind a controversial move to include the ultra high risk category into the DSM-V psychiatric manual, which he later abandoned as a result of public pressure.

²⁵⁹ Patrick McGorry, Eoin Killackey, and Alison Young, 150.

²⁶⁰ Patrick McGorry, Merete Nordentoft and Erik Simonsen, "Introduction to 'Early Psychosis: A Bridge to The Future,'" *British Journal of Psychiatry* (2005), 1.

²⁶¹ Early intervention is defined by Patrick McGorry and colleagues as early secondary prevention in the paper cited in footnote 251, since psychotic disorders can only be diagnosed by symptoms. It is important to note there are differences among clinicians in the field on what stage in the early intervention paradigm is appropriate for treatment. At EPPIC in Australia intervention into the ultra high risk stage is supported, while Canadian programs by in large provide treatment during the first episode stage.

²⁶² Delayed treatment is associated with poor outcome, but it is not the only factor. See "Effects of Duration of Untreated Psychosis on Long-Term Outcome of People Hospitalized with First-Episode Schizophrenia" by Amerech Shivastava et al.

²⁶³ The problem with gene-centric risk detection strategies is that they seek to identify and treat behaviour as a solution to health and social problems. Little attention is paid to social determinants of health as strategy to prevent psychosis, which ecological research reveals is associated with poverty.

²⁶⁴ Eva Jablonka and Marion Lamb, 160.

interior and was collapsed into a homogenous class and extended to pre-psychotic²⁶⁵ youth similar to Freud. Recall that his mental economics was also an internal model that lumped several behavioural disorders together and broadened crisis to healthy society.²⁶⁶ As evidence, McGorry and colleagues incorporated phenomenology into research to identify self-disturbance in young people²⁶⁷ who are considered to be at ultra high risk of translating to first-episode psychosis to reduce false positive rates.²⁶⁸ There has also been backlash to the category by peers and the Australian public, since many feel exposing youth to the stigma of a psychiatric diagnosis²⁶⁹ and antipsychotic drugs before the appearance of consistent frank symptoms is unjustified.²⁷⁰ More indirectly, early psychosis care is developed around the stress vulnerability model that holds genetically predisposed individuals develop schizophrenia in response to environmental stressors consistent with psychodynamic models.²⁷¹ Let me qualify, among several differences, the biopsychosocial model is a "colonisation of the psychological and social by the biological" and integrated biological, psychological, and social therapies are offered as

²⁶⁵ Pre-psychotic, or ultra high risk youth are categorized by McGorry and his team as having a) sub-threshold psychotic symptoms b) a frank psychotic episode that lasted for no longer than a week or c) trait risk factor identified by a first degree relative with psychotic disorder together with decline in functioning during the past year.

²⁶⁶ Freud's abnormal psychology sub-divided mental disorders in general, while McGorry assigned variation to the constellation of psychotic disorders. He is seeking to expand his classification system to include more general mental pathology under the umbrella of psychosis.

²⁶⁷ Barenby Nelson, et al. "The Phenomenological Critique and Self-disturbance: Implications for Ultra-High Risk ("Prodrome") Research," *Schizophrenia Bulletin* 34, no. 2 (2008), 381-382.

²⁶⁸ The number of youth who translate to psychosis is moderate to low. See Alison R. Yung and Barnaby Nelson, "Young People at Ultra High Risk for Psychosis: Research From the PACE Clinic". *Revista Brasileira de Psiquiatria* 33 (2011),5-6.

²⁶⁹ Dr. Ashok Malla who is Canada Research Chair in Early Psychosis commented on a schizophrenia research forum July 2009 that at risk syndrome slated for DSM-V is misguided because of its potential for social harm. The idea of introducing stigma and possible rejection of treatment were part of his concerns. See [http://www-schizophreniaforum.org/for/live/detail.asp?liveID=68#\(47A03A8B-EE4B-4371-A326-\)D8587581CD6](http://www-schizophreniaforum.org/for/live/detail.asp?liveID=68#(47A03A8B-EE4B-4371-A326-)D8587581CD6)

²⁷⁰ Melissa Raven et al. "NEURAPRO-Q Study: Objections to Trial on Ethical and Methodological Grounds", July 2011.

²⁷¹ According to Joseph Zubin on page 469 of his 1988 article "Chronicity Verses Vulnerability" published in *Handbook of Schizophrenia* Emil Kraepelin and Freud acknowledged inherited vulnerability to psychosis. In an important distinction Kraepelin did not recognize the environment as a primary cause of the mental state, while Freud believed psychosis was an act of rebellion against Western culture. For Freud social conflict was thought to cause mental pathology in parallel with the diathesis-stress model that advances stressful life events bring about the onset of psychotic illness.

treatment.²⁷² In a major contrast, Freud's theory of mind is a closed system, while the new model is partly open similar to other post-modern theories.

In a related connection to the past early psychosis intervention's staging model does not permit the detection of HERV-W schizophrenia discovered in recent onset youth,²⁷³ which puts a sub-group at risk of chronic illness and disability.²⁷⁴ The problem cuts across preventive psychiatry, since despite conceptual adaption to local experience,²⁷⁵ clinicians rely on behavioural diagnostic markers and methods²⁷⁶ to eliminate risk of psychotic disorders based on established treatment protocols proven to have limited health value.²⁷⁸ As a consequence, early psychosis reform based on a norm of incremental improvements in knowledge²⁷⁹ as a substitute for the formula where symptoms are correlated with course²⁸⁰ is failing to provide relevant care. Recovery rates were so low in the field in 2005, two professors from the University of Toronto's Department of Psychiatry commented "to say that progress has been made permits us to begin talking about recovery is simply overstating the case".²⁸¹ According to the psychiatrists, only 15% met the criteria, which was lower than the rate at the end of the

²⁷² John Gleeson, Eoin Killackey, and Helen Krstev. *Psychotherapies for the Psychoses: Theoretical, Cultural and Clinical Integration* (East Sussex: Routledge, 2008), 2.

²⁷³ Existing assessment methods do not cover a variety of classification systems and ignore differential diagnosis and co-morbidity. See page 101 in *Psychiatric Genetics: Methods and Review* edited by Marion Leboyer and Fran Bellivier

²⁷⁴ H Karlsson et al, "HERV-W RNA Detected in the Plasma From Individuals With Recent Onset Schizophrenia or Schizoaffective Disorder," *Molecular Psychiatry* 9 (2004), 12-13.

²⁷⁵ Approximately 50% of patients with schizophrenia tested positive for two major HERV-W antigens and elevated serum levels of C-reactive proteins (CRP) was seen in schizophrenia patients who developed cognitive decline. HERV-W is thought to fuel sub-acute and chronic inflammation through immune pathways, consequently, antipsychotic and psychosocial therapies may not be overly effective in treatment of the disease. For details on the role of CRP in schizophrenia see page 3-4 in "Human Endogenous Retrovirus Type W (HERV-W) in Schizophrenia: A New Avenue of Research at the Gene-environment Interface" by Marion Leboyer et al.

²⁷⁶ Swaran P. Singh and Helen L. Fisher, "Early Intervention in Psychosis: Obstacles and Opportunities." *Advances in Psychiatric Treatment* 11 (2005), 71-72.

²⁷⁷ Ricardo Coentre et al. "Initial Diagnosis and Treatment in First-Episode Psychosis: Can an Operationalized Diagnostic Classification System Enhance Treating Clinicians' Diagnosis and the Treatment Chosen?" *Early Intervention in Psychiatry* 5 (2011), 132-139.

²⁷⁸ For a review of a ultra high risk youth program study in Singapore and ethical issues that emerged in cultural context see "Translational and Clinical Research in Singapore: Ethical Issues in a Longitudinal Study of the Prodromal Phase of Schizophrenia" by Tamra Lysaght et al.

²⁷⁹ Patrick McGorry, Eoin Killackey, and Alison Young, 148.

²⁸⁰ Maria Mattsson, "First Episode Psychosis and Outcome Findings from a Swedish Multi-Centre Study," Karolinska Institutet, 2007, 10.

²⁸¹ G. Remington and C. Shami, "Overstating the Case About Recovery?" *Psychiatric Services* 56 (2005), 1022.

20th century in traditional psychiatry in the United States and the United Kingdom.²⁸² More recently, a three year outcome study in Hong Kong did not detect a reduction in relapse in first-episode psychosis patients compared to those receiving standard care, similar to other studies around the world.^{283 284} In another survey on the durability of early intervention programs it was demonstrated two year specialized treatment gains are not sustainable,²⁸⁵ but Canadian researchers reported improvement in psychotic symptoms and better functioning after five years of continuous care.²⁸⁶ These findings agree with a seven year long-term follow up study of first-episode youth at EPPIC in Australia that revealed 37-59% achieved symptomatic remission, while social/vocational recovery was observed in 31%.^{287 288 289} Together the research highlights improved health is possible and worth investing in, but new medical and social strategies are also needed to improve people's lives. Transition to primary prevention is revealed as critical to deal with environmental factors contributing to psychosis and to move mental health reform forward.

²⁸² Richard Warner identified on page 63 and 76 in his book *Recovery From Schizophrenia: Psychiatry and Political Economy 3rd edition* in a long-term study recovery rates at the end of the 20th century was around 20% and 35-40% of people with schizophrenia were socially recovered at follow-up. Earlier during the great Depression, complete recovery rates were lower at 12%. while social recovery fell no less than 30%.

²⁸³ Eric Y.H. Chen et al, "Three-year Outcome of Phase-Specific Early Intervention for First-Episode Psychosis: A Cohort Study in Hong Kong," *Early Intervention in Psychiatry* 5 (2011), 315-323.

²⁸⁴ A lack of mental health resources and high case loads was identified as a possible source of variation in outcome between Western and non-Western first episode psychosis patients in the Hong Kong study and requires more research.

²⁸⁵ Mette Bertelsen et al., "Five Year Follow-Up of a Randomized Multicenter Trial of Intensive Early Intervention vs Standard Treatment for Patients With First Episode of Psychotic Illness," *Archives of General Psychiatry* 65, no. 7, 762-771.

²⁸⁶ It remains to be seen if the rates reported after five years of continuous care persist after step-down to general health care. For reference see "Symptom and Functional Outcomes for a 5 Year Early Intervention Program for Psychoses" by Ross Norman et al.

²⁸⁷ L.P. Henry et al, The EPPIC Follow-up Study of First Episode Psychosis: Longer Term Clinical and Functional Outcome 7 Years After Index Admission," *Journal of Clinical Psychiatry* 71, no. 6 (2010), 716-728.

²⁸⁸ The symptomatic, social, and vocational recovery statistics are promising, but disclose little about the level of independence in patients. Also, they numbers do not reflect the recovery rates of 57% of the group diagnosed with schizophrenia/schizophreniform disorder. This group is more actively psychotic with lower vocational recovery rates in another related study.

²⁸⁹ The international early psychosis group iFEVR has developed a consensus statement on the rights of youth with psychosis to education, employment, and training. Some programs in the field of early psychosis intervention provide education and vocational support as a new component of treatment to improve patient outcomes, but has yielded limited long-term results. Worth noting is vocational recovery studies do not measure long-term high skilled employment in their client population, which is necessary in a knowledge-based economy.

Reprocessing The Myth of Bad Genes

Breathing new life into old theories of psychotic illness, molecular research reveals biosocial approaches based on new gene concepts are the most effective way to treat inflammatory forms of schizophrenia and related disorders. HERV scientists and other epigeneticists suggest new strategies are required for wide-array of diseases,²⁹⁰ yet eugenic programming is being offered to first-episode psychosis patients and families in a another repeat of history instead.²⁹¹ Due to industry standards in psychiatry to prevent psychosis through risk management, services to eliminate "harmful genes"²⁹² are being inappropriately recommended as a substitute for sexual health and pregnancy programming.²⁹³ Ironically, as affected individuals experience impaired sexual functioning²⁹⁴ and young women are now having more babies,²⁹⁵ ²⁹⁶genetic counselling is offered for Mendelian disorders²⁹⁷ some argue help patients and families alleviate ideas of genetic determinism, gauge reoccurrence risks, and reduce environmental risks associated with pregnancy.²⁹⁸ ²⁹⁹ In response, I offer as a reminder, genetics is founded on "eugenic

²⁹⁰ Marion Leboyer and David Kupfer advance new integrated care systems are needed in the treatment bipolar disorder. They point out currently there is lack of treatment of co-morbid psychiatric and medical conditions, which is leading to chronic illness and disability. See "Bipolar Disorder: New Perspectives in Health Care and Prevention".

²⁹¹ In Alberta and British Columbia, Canada involuntary sterilization was mandated until the 1970's. People in mental health institutions were targeted for sterilization as a way to prevent social problems and like several other countries, programs were implemented to control reproduction in other marginalized groups. In a shocking statistic 56% of cases presented to the eugenics board in Alberta were under 24 years old. In a disturbing parallel, British Columbia is championing genetic counselling and other gene-centric approaches among youth with psychosis in modern psychiatry. For historical details on eugenics in the Canadian West see "Sterilizing the "Feeble-minded": Eugenics in Alberta, Canada, 1929-1972" by Jana Grekul, et al.

²⁹² Floyd E. Bloom and David J. Kupfer ed., *Psychopharmacology: The Fourth Generation of progress*, 4th edition. Lippencott, Williams, & Wilkins, 1995. See www.acnp.org/g4/gn401000181/ch177.html

²⁹³ Highlighting the scope of the problem services addressing healthy sexual development are not part of psychiatric services and most high risk pregnancy programs in the general medical community in Canada do not specialize in psychotic disorders. Instead, emerging out of psychiatry in Western Canada genetic counselling has been made available to individuals with psychosis and their families across communities in the country through a public outreach program. See www.facebook.com/understandingmentalillness.

²⁹⁴ See www.gethelppearly.ca/issues.htm

²⁹⁵ Patricia Nicholson, "Fertility Rates are Rising in Women with Schizophrenia." September, 24, 2012. *Women's Health Matters*.ca

²⁹⁶ Fertility is reported to have increased in women with major psychoses as a result of 2nd generation antipsychotic medications that do not induce hyperprolactinemia.

²⁹⁷ Wayne D. Hall, Kathryn I Morley, and Jayne C. Locke, "The Prediction of Disease in Genomic Medicine." *EMBO Reports* 5 (2004), s22-s26.

²⁹⁸ In the article cited in footnote 295 pregnancies among Ontario women with schizophrenia increased on the population level and women between 20-24 years old reportedly matches the levels of the general population. However, genetic counselling is targeted at parents by Canadian genetic researchers to address their concerns. Together these highlight a need for rights based sexual and reproductive health care for women with psychotic disorders. For reference on genetic counselling see "Psychiatric Genetic Counselling for Parents of Individuals with Psychotic Disorders: a Pilot Study" by Jehannine C. Austin and WilliamG. Honer.

faith"³⁰⁰ ³⁰¹ and there are better ways to ease fears about perpetuating schizophrenia³⁰² and managing health than through policies that control human reproduction. Like sterilization campaigns in the 20th century,³⁰³ genetic counselling raises serious questions about encroachment on reproduction and other rights. Has anyone thought about restricting the right to procreation based on discrimination? How about the unreliability of quantifying risk based on genetic makers, or the psychological effects of "probabilistic risks" on or identity? ³⁰⁴ If that is not enough, what about discrimination based on information that does not causally predict neuropsychiatric disorders?³⁰⁵ Malthusian preventive checks on population³⁰⁶ reformatted as preventative mental health care in the 21st century? I suggest it is time to openly debate how genetic counselling promotes the sexual and reproductive health rights of women protected by the United Nations *Convention on the Rights of Person's with Disabilities* ³⁰⁷ and the *International Covenant on Economic, Social, and Cultural Rights*.³⁰⁸ ³⁰⁹

²⁹⁹ JL Roos, "Genetics of Schizophrenia: Communicating Scientific Findings in the Clinical Setting," *African Journal of Psychiatry* (2011), 106

³⁰⁰ Marius Turda, 19.

³⁰¹ Based on Emil Kraepelin's political agenda former student Ernst Rudin who was president of the world wide Eugenics Federation conducted research into the hereditary causes of dementia-praecox and 1917 became the head of the department of genetics and demography at the newly established German Research Institute of Psychiatry directed by Kraepelin. Rudin who organized the murder of psychiatric patients before the holocaust in Germany, established the research paradigm for future psychiatric genetics. See pages 165 in *International Relations in Psychiatry: Britain, Germany, and the United States to World War II* edited by Volker Roelke, Paul Weindling, and Louise Westwood.

³⁰² Along with other assumed benefits psychiatric genetic counselling is being marketed as potentially de-stigmatising. The campaign requires an ethics investigation, since it advances an invasive biological remedy to cope with negative social values.

³⁰³ Hugo Solari and colleagues from the Department of Psychiatry at the University of Illinois recommend proactive family planning to curtail high rates of unwanted pregnancies. They forward long-acting contraceptives injection for patients with psychosis as part of family planning, which is merely a relative difference from castration programs in the past. See "Understanding and Treating Women with Schizophrenia During Pregnancy and Postpartum" in *Canadian Journal of Clinical Pharmacology* 16 (2009), 23-32.

³⁰⁴ Sara Shostak and Jeremy Freese suggest focus on probabilistic genetic risks have a negative impact on identity in the *Handbook of Medical Sociology* (6th ed.) by Chloe E. Bird et al. See page 421.

³⁰⁵ JL Roos, 110.

³⁰⁶ See Thomas Malthus, *An Essay on the Principle of Population*. Section I.II.3-II.1.4.

³⁰⁷ Article 23 in The Convention on the Rights of Persons with Disabilities at www2.ohchr.org/english/law/disabilites-convention.htm

³⁰⁸ See General Comments in no. 14 (2000) "Substantive Issues Arising in the Implementation of the International Covenant of Economic, Social and Cultural Rights" by the United Nations Economic and Social Council for right to health criteria.

³⁰⁹ In 2000 improving gender equality, child mortality and maternal health were agreed upon targets to achieve by 2015 by world leaders. The campaign is now under review for failure to meet human rights standards and established goals. For a full list of goals see the *UN Millennium Development Goals and Human Rights* document at www.ohchr.org/EN/Issues/MDG/Pages?MDGIndex.aspx

As proof of classical socio-economic theory^{310 311} in modern psychiatry, a psychopharmacology handbook suggests balancing the potential burdens of a child being ill with the potential benefits of having a child in families susceptible to schizophrenia. Financial factors related to the decision reportedly include "treatment costs for the affected individual, as well as costs to society for the lost productivity of the individual".³¹² Representing a 21st century quantitative shift, a researcher in Canada is examining "the effect of genetic counselling on adherence to psychotropic drugs..."^{313 314} and an early psychosis program anticipates genetic studies will lead to correcting genes with mutations³¹⁵ identified as unfeasible by HERV science. HERV-W biology reveals not only are there several genes involved in schizophrenia,³¹⁶ but the epigenome is comprised of plastic viral DNA, moving genetic elements, and developmental systems that react to the environment and influence the behaviour of chromosomes as I outlined. Basically, trying to find genes responsible for schizophrenia for gene therapy is the equivalent of trying to shoot an arrow through a moving target.³¹⁷ As an alternative hard science suggests focusing on susceptibility genes,³¹⁸ ensuring safe treatments, and working on making the world a better place to live to prevent disease. The bottom line is

³¹⁰ According to C.B. Macpherson the rationality of unlimited desire juxtaposed against scarcity was a mechanism to drive unlimited appropriation in early liberal theory. Malthus popularized the principle in his *An Essay on the Principles of Population* by arguing the sexual appetites of the poor led to population growth at a faster rate than the means of subsistence. He introduced positive (e.g. disease and famine) and preventive checks (e.g. delaying marriage) that kept the population in a state equilibrium to extend the life of the upper classes.

³¹¹ Thomas Malthus borrowed John Locke's concept that the desire to avoid pain motivated human activity. He believed rational people would avoid having too many children to prevent demands on limited food supply to increase their chance of survival. See page 79 in *Population: Introduction to Concepts and Issues* 11th edition by J.R. Weeks.

³¹² Floyd E. Bloom and David J. Kupfer, 5-6.

³¹³ See www.bloomberg.com/article/2012-05-16/aKV1pTa2OyDg.html

³¹⁴ Dr. Jehannine Austin received a \$100,000 grant from Pfizer Canada Research Awards Program to support her study into genetic counselling and drug adherence. This raises critical concerns on the role and purpose of genetic counselling in the post-genomic era where there is increasing recognition the environment shapes the outcome of multifactorial diseases. The ethical implications of using genetic counselling to promote the use of antipsychotics in psychiatry is need of thorough examination in view of historical and current debates on the cause of mental illness.

³¹⁵ Early psychosis Sucks, www.psychosissucks.ca/epi/whatacausespsychosis.cfm#chances

³¹⁶ David A Collier et al, "Advances in the Genetics of Schizophrenia: Will High-Risk Copy Number Variants be Useful in Clinical Genetics or Diagnostics?" *Medicine Reports* (2009), 1-6.

³¹⁷ N. A Holtzman from John Hopkins University School of Medicine explains whole organisms potentially reproduce individuals, rather than genes. The complexity involved in complex traits it is argued makes it impossible to artificially control the behaviour of genes. See "Genetics and Social Class" by Holtzman.

³¹⁸ Several genes are thought to interact non-linearly with each other and the environment to increase susceptibility to schizophrenia.

scientific reductionism and the quantification of human life should stay in the past as something to mourn and avoid, considering the suffering and lost lives associated with it. The reality is, however, eugenics is still endorsed in some parts of the world. In Australia, the government attempted to legislate the sterilization of girls as young as 12 years old and women over 18 who are incapacitated,³¹⁹ while other countries routinely sterilize women as a method birth control.³²⁰

21st Century Mental Health Policy Direction

Representing transition in history policy recommendations emerge from HERV-W ecology of psychosis in support of promoting the health of individuals with psychotic disorders in the context of economic and social rights to move beyond history. As a result of a new articulation of biology maternal care emerges as a critical area for non-invasive prevention strategies and is a metamodern feminist issue,³²¹ considering the historical effort to control human reproductive processes in women with schizophrenia. Along side men,³²² their right to enter into relationships and have children continues to be undermined despite experiencing a range of health states individually, and as a group. I suggest to balance societal power over human biology by population policies founded on social Darwinism and eugenics fresh rules that acknowledge the role of the environment in disease are needed to avoid "making disability an issue of parental responsibility and

³¹⁹ As a result of lobbying by the Women with Disabilities Australia organization sterilization laws and other questionable practices in Australia will be reviewed by the Australian Community Affairs References Committee for a report by April 2013. The Executive Director of WWDA stated in an email in advance of the report sterilization laws will be removed from the Western Australian Mental Health Bill, but electroshock of children between 14-18 years old is still being tabled. See Journal of the Senate no. 113 Wednesday 19, September 2012 for details on the Australian Parliamentary Committee Investigation.

³²⁰ Many disabled women in some parts of the world are sterilized without their knowledge and consent to supposedly protect them from risk of sexual violence, however, sterilization as a solution for neglect and rape compounds violence against them. Tirza Leibowitz commented in "The Dark Side of Protection: Forced Sterilization of Women with Disabilities" that there needs to be a shift to remove environmental attitudinal barriers that lead to isolation and segregation of people with disabilities and policies like forced sterilization that support it.

³²¹ I suggest a 4th wave mode of feminism is necessary to analyse the continued control of sexual reproduction in woman and men diagnosed with severe psychiatric disorders and other disabilities. There needs to be a shift to looking at reproduction holistically, without neglecting that women are by in large targets of sterilization and other biological and social intervention policies.

³²² In the US in the late 1800s epilepsy and psychosis were thought to be connected to ovarian disease and castration was performed as method of treatment. Men were also sterilized by removal of their testes revealing the universal nature of the eugenics program.

fault." ³²³ To get a discussion started on the sexual and reproductive health rights of individuals with neuropsychiatric illness, ³²⁴ HERV-W ecology identifies resources should be allocated to prevent sexually transmitted infections and influenza in expectant mothers, since environmental viruses trigger HERV-W causing placenta disorders and sets up risk in fetuses and newborns for first-episode psychosis later. ³²⁵ ³²⁶ Epigenetics has uncovered nutrition supports healthy methylation in cells ³²⁷ and cellular patterns are inherited over several generations, ³²⁸ so promoting healthy eating and vitamin supplements to support fetal development is critical as well. ³²⁹ In Ontario, Canada, people with psychiatric conditions receiving disability benefits are ineligible for a medical nutritional allowance ³³⁰ and several countries do not provide benefits at all, therefore, welfare reform must be a top priority. ³³¹ To realize health rights ³³² it is essential to ensure a living income ³³³ and flexible benefit eligibility criteria, ³³⁴ spousal guidelines, ³³⁵ childcare options, ³³⁶ and education and employment support

³²³ Matthew Thompson, *The Oxford Handbook of The History of Eugenics* edited by Alison Bashford and Philippa Levine (Oxford: Oxford University Press, 2012), 127.

³²⁴ Sexual and reproductive health rights among the disabled is an emerging global issue. See *Sexual and Reproduction Health of Persons with Disabilities* by the United Nations Population Fund.

³²⁵ For commentary on the role of the flu virus in pre-eclampsia and schizophrenia see pages 65-85 in *Retrotransposition, Diversity and the Brain* edited by F.H. Gage and Y. Christen.

³²⁶ HERV-W research introduces inflammatory forms of schizophrenia as an endemic infectious-based disease, therefore, biological preventive treatment for the condition is supported under the right to health statute in the *International Covenant on Economic, Social, and Cultural Rights*.

³²⁷ Sang-Woon Choi and Simonetta Friso, "Epigenetics: A New Bridge Between Nutrition and Health," *American Society of Nutrition* (2010), 8-16.

³²⁸ Jan Sapp, *Genesis: The Evolution of Biology* (New York: Oxford University Press, 2003), 215.

³²⁹ Patrick O. McGowan, Michael J. Meany and Moshe Szyf, "Diet and the Epigenetic (Re)programming of Phenotypic Difference in Behaviour". *Elsevier* (2008), 18.

³³⁰ Michael Hassell, Zoe Thomas, Jennifer Hanson, and Craig Potter, "Analysis of the ODSP Special Diet Allowance," Faculty of Law, University of Western Ontario, 1.

³³¹ Benedetto Saraceno recorded one quarter of all countries do not provide disability benefits to patients with mental disorders.

³³² Most social welfare systems for people with disabilities are organized around supporting disability, rather than promoting health. There have been incremental changes to education and employment policies in Western European and North American countries, but largely systems remain crisis oriented. For more information see Bernd Marin's discussion on social welfare policy in Europe referenced below.

³³³ As a sample a single person with no dependents receives \$1064.00 a month plus basic drug and dental provincial benefits in on the Ontario Disability Support Program (ODSP) in Ontario, Canada. In France, Allocation aux adultes handicapés (AAH) benefits are 681.63 euros plus additional supplements for qualified individuals. In Ontario reforms to disability policy are in the works, but the province is taking a step backwards by transferring services to municipal welfare programs.

³³⁴ Bernd Marin, Chapter 1, *Transforming Disability Welfare Policy. Completing a Paradigm Shift*, 29-21. See www.euro.centre.org/ability/introp.pdf

³³⁵ The Ontario disability support program considers the income of a spouse a part of the benefit unit of a disabled applicant to determine eligibility for assistance. Spouses who earn more than Ministry guidelines are expected to support disabled dependents who

programming³³⁷ to name a few. Novel medications with low risk to patients and embryos³³⁸ also need to be supported on the research level and subsidized for women without public, or private insurance.^{339 340} As a priority specialized maternal and infant care needs to be integrated into existing medical³⁴¹ and alternative programs³⁴² to monitor and promote the health^{343 344 345} of expectant mothers with psychosis experiencing a range of health states in communities as a substitute for genetic counselling. Overall, there must be a radical shift in liberal culture exported to nations around the world from controlling sexual and reproductive health to supporting human relationships and having children and families by choice.^{346 347 348}

are then disqualified from receiving benefits. It is important to note provincial disability rules are based on early 20th century Western cultural models of the family, and are unrealistic in a 21st century economy, where 67% of households in Canada in 2007 were represented by two wage earners .

³³⁶ In Ontario childcare policy is tied to employment. Childcare options designed to assist non-working disabled recipients with children may be necessary to realize their right to reproductive and sexual health.

³³⁷ In a National Statistics survey in the United Kingdom unemployment has risen from 11% in 2002 to 20% in 2012 among 16-24 years olds. Lack of unemployment is identified as the cause of more youth living at home with parents, which is affecting their ability to be autonomous. The rates of youth living at home are higher among people with disabilities and reveals a need for measures to help individuals with disabilities secure employment that provides a living wage. However, reform measures supporting low-skill level minimum wage jobs is being implemented in Ontario, Canada with a proposal to integrate Ontario Disability Support Program with municipal welfare/workfare programs. For U.K youth well-being statistics see "Measuring National Well-being-Measuring Young People's Well-being, 2012" by Angela Potter-Collins and Jen Beaumont.

³³⁸ Antipsychotic drugs commonly prescribed for psychotic illness cause a range of side-effects in patients and are reported to cause abnormal muscle movements and withdrawal symptoms in newborns whose mother's were on the class of drugs during pregnancy. Moreover, recent studies reveal antipsychotics increase expression of HERVs in brain cells.

³³⁹ Safe effective medications should be subsidized for all low income patients.

³⁴⁰ As economic justification for an accessible (non-stigmatizing) drug benefit program that includes novel agents, cost of care for schizophrenia was estimated at 1.6% to 2.5 % of health care budgets in developed countries. Drugs costs form only 2% to 5.6% of total costs of care for the disease. See "Commentaries on the Cost of Illness of Schizophrenia" by Sandeep Grover et al.

³⁴¹ M.V. Seeman, "Clinical Interventions for Women with Schizophrenia: Pregnancy," *Acta Psychiatrica Scandinavica*, 2012.

³⁴² Midwifery programs are preferred option of care for some women in Western nations and is a central part of health care in countries around of the world. See www.who.int/topic for information on midwifery by the World Health Organization.

³⁴³ Louise Howard and Trudi Senviratne, "Management of Women with Psychosis During Pregnancy", *Progress in Neurology and Psychiatry* (2008), 9-12.

³⁴⁴ Obstetric complications were revealed by Assen Jablensky and colleagues from the University of Western Australia to be higher in women with schizophrenia than the general population. Additionally, aboriginal women with schizophrenia were shown to be at increased risk compared to non-aboriginals. A major limitation of the study was that women experiencing different rates of recovery and environmental risks during pregnancy were not identified. This highlights the need for comparative epigenetic research among women with schizophrenia and early detection strategies for placenta disease in vulnerable populations. See "Pregnancy, Delivery, and Neo-natal Complications in a Population Cohort of Women with Schizophrenia and Major Affective Disorders" by Assen Jablensky et al.

³⁴⁵ Physical exercise during the first 20 week of pregnancy is shown to reduce the risk of preeclampsia and may be an important health strategy for affected pregnant women with schizophrenia and developing fetuses. Exercise is also shown to generally improve self-esteem and lower fatigue and tension in expectant mothers in a related finding. See "Impact of Physical Activity During Pregnancy and Post-Partum on Chronic Disease Risk" by James Pivarnick et al.

³⁴⁶ CB Macpherson identified in his essay "The Maximization of Democracy" contained in his book *Democratic Theory: Essays in Retrieval* that shifting global dynamics led to new demands on the political market. I suggest modern preventive strategies for psychosis have created demand for a new category of choices that mental health and related systems need to accommodate.

³⁴⁷ For a discussion on woman's right to reproduction see Dr. Nafis Sadik, "The Right to Reproductive Sexual Health" *United Nations* at www.un.org/ecosocdev/geninfo/women/womrepro.htm.

In a system wide plan for global mental health reform horizontal action across systems is also necessary,^{349 350} given that *laissez-faire* economics perpetuates increasing poverty and disability³⁵¹ by isolating political, economic, social, mental health, and physical health care systems. As evidence the individual-level early psychosis recovery graphs presented reveal the neglect of overlapping health determinates dramatically complicates a person's life, which poses a risk for relapse and sets up a chronic trajectory of illness. Indeed multiple researches verify material inequality is an indicator of poor physical, emotional, and financial health in first-episode psychosis youth and families across cultures revealing the wide scope of the problem that needs immediate attention.³⁵² HERV-W ecology presents as a solution sexual and reproductive health strategies^{353 354} synchronized with new therapeutic,³⁵⁵ service-delivery,^{356 357 358} anti-discrimination,³⁵⁹

³⁴⁸ Adoption policies must also change for married, or same sex couples who want to adopt children. A psychiatric diagnosis limits the chances of qualifying for adoption. In the United States international adoptions are prohibited for people with schizophrenia. See adoption.state.gov/county_information?country_specific_info.php?county-select=china

³⁴⁹ World Health Organization members in partnership with the Department of Clinical Psychology at the University of Maastricht in the Netherlands reported prevention and promotion in mental health should be integrated within a public policy approach that involves diverse public sectors to generate win-win situations across sectors. See page 12 in "Prevention of Mental and Behavioural Disorders: Implications for Policy and Practice" by Shekhar Saxena Eva Jane-Llopis and Clemens Hosman.

³⁵⁰ Laurie Monsebraaten, "Small Fixes in Ontario's Welfare System Not Enough, Says Progress Report." *The Star.Com*. February 2, 2010.

³⁵¹ People's Health Movement, *Addressing Unhealthy Policies*, 4. See www.who.int/social_determinant/resources/egypt.pdf

³⁵² 80% of people with disabilities world-wide live in developing countries, which offers evidence of the direct link between poverty and illness. It also reveal the breadth and depth of structural inequality between nations around the world.

³⁵³ Currently, there is a focus on behavioural risks associated with pregnancy in chronically ill patients with schizophrenia in psychiatry, rather than physical risk factors that complicate pregnancy in affected individuals who live in the community and experience a range of health states. For a review of the behavioural approach see "Sexuality, Reproduction, and Family Planning in Women with Schizophrenia" by Laura Miller.

³⁵⁴ Dedicated research-based services at placenta clinics are needed for women with schizophrenia considering the connection between HERV-W in normal and abnormal placentalization and the condition. Moreover, studies reveal schizophrenia is generally associated with 1) complications in pregnancy 2) abnormal fetal growth and development 3) and complications in delivery.

³⁵⁵ See www.geneuro.com for a novel biologic medication indicated for schizophrenia that was well tolerated in a phase I randomized double-blind placebo-controlled clinical trial for multiple sclerosis and is now in phase IIa clinical study.

³⁵⁶ Early psychosis intervention has developed resources for general practitioners to detect early signs and symptoms of psychosis, consequently, it may be feasible to extend service delivery to groups in Western nations and in countries like China who have large rural population to local physicians. The Chinese like the Indigenous in Canada and elsewhere have strong-kinship ties and a long history of reliance on local healers and natural medicine, which psychological based mental health systems are not equipped to deal with and may be part of the solution to closing the gap in service delivery to ethnic groups.

³⁵⁷ For a review of aboriginal healing practices see "Beyond the Four Waves of Colonisation" by Darien Thira.

³⁵⁸ A study on attitudes toward mental disorders in Maharashtra India uncovered beliefs about caution of mental disorders influenced social distance. For psychosis perceiving the cause as genetic was associated with greater social distance, while perceiving infections as a possible cause was associated with decreased social distance. Physician and community education campaigns about the infectious nature of HERV-W related psychotic disorders may be an effective strategy to reduce stigma and improve access to care in some cultural contexts. See "Attitudes to People With Mental Disorders: A Mental Health Literacy Survey in a Rural Area of Maharashtra, India" by Michelle Kermodé et al.

education, employment,³⁶⁰ and social welfare measures to prevent illness and support recovery from schizophrenia and related disorders. I suggest a multi-system population level plan is imperative to realize health and citizenship a new generation coping with psychotic disorders is demanding from democracies around the world. Balancing psychological models in mental health care with new concepts in biology is "win-win" for everyone as a reminder, since it opens up the possibility for health promotion³⁶¹ and positive primary preventative care that is appropriate and accessible as a move toward improving health in global populations and lowering demands on governments.

Equality and Citizenship in A Changing World

Looking back prejudice toward people with psychiatric illness is entrenched in mental health care and related systems around the world because liberal ideology was transported as a part of biological exchange³⁶² and reform has been incremental, uncoordinated, and slow.³⁶³ Heredity belief that "like breeds like"³⁶⁴ can be seen in poverty related mental health disparity³⁶⁵ and sexual reproductive health practices in developing and developed countries,³⁶⁶ which renders psychiatric care inappropriate

³⁵⁹ A 2009 report on mental health care in Great Britain indicates prejudice against people with mental health problems is increasing despite improved attitudes toward sexuality and ethnicity, which indicates the need for effective anti-stigma and anti-discrimination strategies. See page 3 in "Leadership for Personalization and Social Inclusion in Mental Health" by Ruth Allen and colleagues.

³⁶⁰ Unemployment needs to be addressed in general in societies. For a policy discussion on education and employment in a Canadian context for people with mental disorders see *Employment and Education for People With Mental Illness* by the Canadian Mental Health Association and Centre for Addiction and Mental Health.

³⁶¹ The World Health Organisation identifies mental health promotion involves actions that allow people to adopt and maintain healthy lifestyles and create living conditions and environments that support health. See the preface in *Promoting Mental Health: Concepts. Emerging Evidence. Practice* (2005).

³⁶² Eugene Thacker defines biological exchange as the circulation and distribution of biological information that is mediated by one or more value systems. For more information see *The Global Genome: Biotechnology, Politics, and Culture* (Cambridge: The MIT Press, 2006), 7-11.

³⁶³ Jill Stavert, 125.

³⁶⁴ N. A Holtzman, "genetics and Social Class". *Journal of Epidemiology and Community Health* (2002), 531-532.

³⁶⁵ For an outline of gaps in mental health care that emerge from centuries of racism and discrimination based on ethnicity in South Africa by Jonathan Burns see "The Mental Health Gap in South Africa-A Human Rights Issue".

³⁶⁶ Despite Millennium Development Goals (MDG) endorsed by world leaders in 2000 to promote gender equality, reduce child mortality and improve maternal health, the sterilization of women with disabilities still exists in many countries and there has been virtually no effort to develop specialized sexual and maternal health services in psychiatry, or the medical community for women with psychotic disorders. See page 7-8 for a summary of MDG goals in the United Nations Millennium Development Goals and Human Rights.

across cultures.³⁶⁷ Confirming the widespread damage of pseudo-science medical anthropologist Arthur Kleinman declared global mental health care is a moral failure of humanity. In an article published in 2009, he listed atrocities against people with psychiatric disorders ranging from abandonment and imprisonment to being chained in bed by careworn parents-- and forced to dance for visiting gawkers at asylums.³⁶⁸ To overcome the fallout of medical and social neglect, Kleinman suggested learning from the local experiences of ordinary people, and argued states need to invest resources to protect individuals with mental illness alongside cultural and institutional changes like in the AIDS epidemic.³⁶⁹ Raising questions about the efficacy of rights alone to establish equality in support of a multi-level approach the novel findings in genetics challenge the concept of "biological individuality"³⁷⁰ inherent in liberal theory. As a challenge to abstract models of human subjectivity based on a coherent unit of selection and evolution, molecular scientists have uncovered human DNA is a symbiotic complex that evolves synergistically with environment. As I demonstrated, a new generation of researchers reveal that human traits and behaviour are shaped by the environment through microbiological processes, and what that translates into is the legitimacy of inalienable rights Jeremy Bentham called "rhetorical nonsense"^{371 372} over half a century ago is in doubt. This along with natural law that the rights discourse is built on.

I cannot expand on it here due to space, but the ideals that underpin natural rights like the discourse on psychosis is problematic because "we entered a 'post-genomic' era where

³⁶⁷ Problems and solutions remain similar even if nations, cultures and economies are diverse according to Benedetto Saraceno. See page 3 in "Mental Health: Scarce Resources Need New Paradigms".

³⁶⁸ Arthur Kleinman, "Global Mental Health: A Failure of Humanity," *Lancet* 374 (2009).

³⁶⁹ Jonathan Burns identifies in the article referenced in footnote 271 HIV/AIDS is associated with higher incidence of psychosis and dementia. He reveals a link between physical and mental health, which points to the need to approach psychotic disorders holistically.

³⁷⁰ Snaib B. Gissis and Eva Jablonka eds., *Transformations of Lamarckism: From Subtle Fluids to Molecular Biology* (Cambridge: The MIT Press, 153.

³⁷¹ Jeremy Bentham, "Critique of the Doctrine of Inalienable, Natural Rights" from Jeremy Bentham, *Anarchical Fallacies*, vol. 2 of Bowring ed., Works, 1843, 4.

³⁷² Bentham argued there are no natural rights because rights are created by the law of a society in support of legal rights.

research has shifted from genes to 'expressed genes' or proteins [such as HERV-W] that have a central role in metabolic processes, a change that has been barely acknowledged outside laboratories."³⁷³ My venture into the laboratory identifies the idea of human essence is really a "whole organism-environment system that supports human development".³⁷⁴ In other words, individuality co-evolves with the environment and rights like DNA and health develop in relation to culture. As it stands, the genetic origins of rights have not been explored,³⁷⁵ but debate about the concept of a person and practical limits of autonomy as a basic principle in bioethics and biolaw has started.³⁷⁶ Additionally, the effectiveness of civil rights law to protect people with psychiatric disorders^{377 378} and symbolic laws that have no formal system of enforcement³⁷⁹ along with cultural bias inherent in rights-based ethics is in progress.³⁸⁰ As a next step, research into the evolution of human rights theory and discussion in light of gene-environment interface concepts in epigenetics is crucial to try to come to a consensus on a system of legal protection that benefits everyone. Hopefully, exploration of the historical development of liberal culture, more broadly, will be the way to move forward to a neutral system of value that acknowledges the interdependency of human beings and the right of every person to health and citizenship as members of global society. The time has arrived to re-evaluate the tenets of Western liberal democracy in view of increasingly

³⁷³ David Keane, 467.

³⁷⁴ Smail B. Gissis and Eva Jablonka eds., 319.

³⁷⁵ David Keane, 467.

³⁷⁶ D.N Weisstub ed., *Autonomy and Human Rights in Health Care* (The Netherlands: Springer, 2008), 89, 81.

³⁷⁷ For a discussion on the limitations of civil right to treatment laws that do not translate into right to services in the United States see "Meeting the Needs of the Mentally Ill: A Case Study of the Right to Treatment as Legal Rights Discourses in the U.S.A" by Michael McCubbib and David N Weisstub.

³⁷⁸ For a comprehensive review of the limitations of rights based mental health laws see *Rethinking Rights-Based Mental Health Laws* by Bernadette McSherry and Penelope Weller.

³⁷⁹ Ursula M Read, Edward Adilbokah, and Solomon Nyame, "Local Suffering and the Global Discourse of Mental Health and Human Rights: An Ethnographic Study of Responses to Mental Illness in Rural Ghana," *Globalization and Health*. 2009, 7.

³⁸⁰ D.N. Weisstub ed., 13.

rapid evolving technology and science, which has made discourses and practices informed by classical values impractical to maintain.

CONCLUSION

To conclude, my analysis has uncovered that we need to begin accepting that schizophrenia and related disorders evolve synergistically with culture, which reinforces illness in a giant feedback loop to make it appear inevitable. It further exposes that the notion of uniform DNA central in past and present discourses on psychosis have been manufactured using the concept of atoms derived from physics. Inappropriately, in light of molecular and experiential evidence, psychotic disorders have been equated with inert matter and used to explain the development of the mind in a causal hierarchical plan.³⁸¹ John Locke was the first to develop a model of class consciousness that quantified the mental life of people with brain disorders and justified inequality in society. His dialectical possessive individualism³⁸² categorized psychiatric illness as a static homogenous mental state opposite fully differentiated rational mind, which allowed him to argue that property forms the essence of an individual. Locke's early behavioural psychology was perpetuated by John Stuart Mill who expanded the formula on the level of groups in a structured model of society founded on a combination of classical physics and chemistry. As an insight both reason and rights were rooted in self-development for Mill like Locke, but Mill's social distribution scheme introduced a formal philosophy of action³⁸³ and law to protect geniuses from the middle and lower classes, who were considered a threat to individual and social progress.

³⁸¹ For an explanation of reductionism in biology see chapter 8 in *Studies in the Philosophy of Biology* by editors F. J. Jayala and T. Dobzhansky.

³⁸² Etienne Balibar, "Possessive Individualism Reversed: From Locke to Derrida", *Constellations* 9 (2002), 301.

³⁸³ French sociologist Alain Ehrenberg used the phrase philosophy of action to denote the focus in Western societies to represent individuals as rational agents of their own change .

In a historic turn, incorporating 19th century thermodynamic concepts Sigmund Freud created a universal social model of mental pathology. His revised mechanistic approach portrayed society broadly as incapable of limitless mental growth. Freud's attempt to equalize the classes was marked by discontinuous development that applied simple thought to pre-psychosis. In a repeat of the past, he created a self-encapsulated closed model of psychotic illness, where affected individuals were considered genetically unable to form identity. Foucault went on to create a spatialized closed social system replica by assigning simple thought to psychosis itself and qualifying the state of mind as underdeveloped.³⁸⁴ Later, he described mental illness as a homogenous condition that occurred through colonization of the mind by power like the rest of society. As a critical difference there is no opportunity for resistance for the biodetermined ill, which segregated them as a distinctive class. In the late 20th century early psychosis reformers created a partly open systems theory that classified major psychoses into individuated stages of development. The secondary prevention model³⁸⁵ delineated youth with psychosis as predisposed to illness and incapable of recovery, except with medical, psychological, and social treatment early in the illness process. As a solution for poor long-term rates controversial risk management strategies such as intervening in the prodrome and genetic counselling are offered as a remedy instead of medical and social approaches. What this did is perpetuate the historical gene-centric notion of harmful biology and marginalize people with neuropsychiatric disease, in another repeat of the past.

³⁸⁴ In phenomenology underdevelopment is equated with a lack of meaning. Worth noting Mark Vonnegut who recovered from four episodes of bipolar disorder explained in his book *Just Like Someone Without Mental Illness Only More So* that when the mind breaks there is too much meaning. See pages 38 and 108.

³⁸⁵ Secondary prevention models in psychiatry are defined by intervening early in the course of disease, rather than preventing prenatal neurodevelopmental abnormalities and other environmental insults. See page 257 in *Psychiatric Genetics: Methods and Reviews* edited by Marion Leboyer and Frank Bellivier.

Guided by mathematics liberal reformers as a collective perpetuated the assumption in classical political theory "that bourgeois human nature is the final form (or, more usually, the universal form except for some supposed primitive age) of human nature."³⁸⁶ As I pointed out, primitive nature was allocated to individuals with cognitive ailments and functioned to justify material inequality.³⁸⁷ In a major contradiction people with serious psychiatric disorders were considered incapable of rationality, but were defined as agents of choice in Western psychology.³⁸⁸ As a caveat, radical liberals extended rationality to pre-psychotic individuals, but simple thought symbolic of abstract use-value is socially (not to mention biologically) meaningless. To explain, in classical economic theory exchange is a prerequisite for value. As a central feature the labour theory of value based on Newtonian physics requires external interaction to produce qualitative change in an object. In principle, people with psychosis are considered incapable of actively producing surplus-value and, therefore, have no intrinsic or "civic worth".³⁸⁹ It is vital to appreciate the dualistic concept of rationality introduced by Locke led to numerous selectionist theories, and in due course, eugenics. In defence of natural selection Herbert Spencer argued: "The defective natures of citizens will show themselves in the bad acting of whatever social structure they are arranged into. There is no political alchemy by which you can get golden conduct out of leaden instincts."³⁹⁰ Spencer provided a market rationale for human interference in biology by later liberal and non-liberal social reformers through systematic violence against psychiatric patients, ethnic groups,

³⁸⁶ C.B Macpherson, *Democratic Theory: Essays in Retrieval* (Oxford; Clarendon Press, 1973), 198.

³⁸⁷ The biodetermined illness concept was broadly applied to the lower and working classes in the 19th and 20th centuries. It was forwarded that ethnic groups, the poor, and working class were inherently vulnerable to mental illness in general.

³⁸⁸ Shu- Yun Ma records in "Political Science at the Edge of Chaos" that originating from economics, rational choice theories insist on methodological individualism, which maintains that in all sorts of social behaviour relevant actors are individuals sharing the same utility maximizing desire. She identifies rational choice theory among other subfields as the most Newtonian in political science. See page 62.

³⁸⁹ In Britain in the early 20th century wage earning capacity determined human value and was seen as necessary for citizenship. See pages 7-9 in "Causes of Racial Decay" by C.J. Bond.

³⁹⁰ Herbert Spencer, 28.

criminals and the poor, which continues today. Exposing the practical limitations of ideology, however, nuclear transmutation of lead into gold has been achieved using nuclear particle accelerators! What is more, genetics founded on Newtonian physics is revealed to be a ghost in the machine model of mind.

Presently, we understand viral genes are distributed unequally in human cells³⁹¹ and DNA is flexible as a result of HERV-W and repeated and mobile genetic elements. Moreover, schizophrenia and related disorders involve a "lifelong evolution of relationships intermingling with HERV-W elements [beginning in utero]..." adding to biology's plasticity.³⁹² As a critical difference from genetic socio-political models, vulnerability is not fixed relative to the environment. Biology is otherwise in a constant state of flux producing genetic coding through biological synergism. In final analysis, new gene-interface concepts expose mathematico-theoretical scientific concepts are badly chosen to explain complex neurological diseases, and furthermore, challenge us to rethink defining a person's identity based on cognitive abilities. HERV-W research also compels the need for governments to extend economic, social, and cultural rights to people with neuropsychiatric disease and their families to promote their inclusion in society. Not to mention to prevent eugenics as a method of dealing with economic and social problems like in the 20th century from happening again in the future. Until then from one interloper to others, if you are reading:

If you encounter destructive despair, do not wink out like a dying star, lost in the darkness of a sad and cold reality. Make your feelings manifest into something; art, letters, protest, activism, engagement, involvement. Manifest something. Express this experience. Let other people see it, and feel it. Make others responsible for the anguish. In order to heal, we as a community must mourn together. When we've done crying, after we've had our disconsolate moment in history, and we've dried our eyes, we need to all roll up our sleeves and get to work.³⁹³

³⁹¹ Herve Perron offered this insight at a video taped conference presentation, which is no longer available on-line.

³⁹² Marion Leboyer et al, 8.

³⁹³ The quote is from text of the author who wrote the poem about recovery at the beginning of my paper.

Wise words from a quiet young voice on the ground presented to start open consideration on the need for biosocial approaches to neuropsychiatric disease around the world.

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