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ON ERROR: UNDISCIPLINED THOUGHTS ON ONE OF THE CAUSES OF INTELLECTUAL PATH DEPENDENCY

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Abstract

Is there not any place in the history of ideas for the imperfect character of human doings (i.e. capability of error) that is repeated for so long until we lately start to think that it had long been wrong? The answer is: In the conventional histories of ideas there is almost none. The importance of the phenomenon, however, is immense. Intellectual history is full of errors. Scholarly errors are among the factors that generate intellectual pathways in which consequences of historical small events feed back up on each other positively and give rise to historical pathologies in the end. Pathways hold the intellectuals dependent on the consequences of errors which interact upon each other and prevent resulting pathologies to disappear fully. As a result, ideas do not converge to a level of perfection. Evolutionary account of errors suggests that errors in the history of ideas matter even though they are often corrected.

Keywords: Errors in the history of ideas, intellectual path dependence, intellectual pathologies, the Coase Theorem, historical small events.

Entelektüel Patikaya Bağımlılığa Yol Açan Sebeplerden Biri Üzerine Düşünceler

Özet

Düşünceler tarihinde insan ediminin mükemmel olmayan karakterine (yani, hata yapma kabiliyetine) ne kadar yer ayrılmıştır? Konvansiyonel düşünce tarihi yazımı içinde hemen hemen hiç. Oysa entellektüel tarih bu tür hatalarla doludur ve bu hatalar entelektüel patikaya bağımlılığın en büyük sebebidir. Entellektüel patikalar, düşünsel hataların sonuçlarının ortadan kalkmaması sebebiyle düşünürleri kendisine bağımlı hale getirir. Hatalar ne kadar küçük olursa olsun pozitif geri bildirimler nedeniyle düşünsel patikalar, çoğu zaman, düşünsel patolojilere dönüşür. Bu koşullar altında, bazı hatalar düzeltilse bile, düşüncelerin genel evrimi mükemmellik seviyesine yakınsamaz.

Anahtar Sözcükler: Düşünce tarihinde hatalar, entelektüel patikaya bağımlılık, entellektüel patolojiler, Coase Kuramı, tarihsel küçük olaylar.

On Error: Undisciplined Thoughts on One of the Causes of Intellectual Path Dependency

Introduction

Darren Oldridge reports a remarkable trial that was held in Rothenbach in 1485 (Oldridge 2005: 1 – 19). The trial was about a woman who was suspected of witchcraft. The Court of Fürstenberg decided to try the woman with a method called "trial by red iron." The method required the person to hold a piece of hot iron and carry it for three paces. The person's hand would then be bound for three days. After three days, the wound would be inspected. If the wound was healed completely, the person would be declared innocent. But if it was still weeping and discolored, the person would be condemned. The trial ended with an impressive result. The woman took the iron from the furnace, walked more than three paces, and asked if she was required to walk further. After all that, she was acquitted and freed.

The story tells that the woman was accused of a crime (witchcraft) that would seem to be "strange" to a reasonable (lawful) mind: She was set free on the basis of a completely arbitrary reason (i.e. passing the test of red iron). The cause of the strange event was cancelled out not because of some systematic cause (of history) and yet by another cause that was no less absurd: that she seemed unaffected by the red iron. Oldridge writes that such trials stopped not because people started to think them illogical but, rather, because the Church Father thought that they were against the Christian Doctrine. Such instances suggest to us that many absurd, strange, erroneous events could have conceivably existed in history, lasted for long periods, and disappeared after some time not because of some systematic tendency inherent in the course of history but, rather, by further absurdities, strangeness, and erroneousness.

Errors, and other types of irregularities alike, have always existed in intellectual history. Although no philosophical or scientific inquiry since the ancient Greeks has been separated from the reflections on error, there is not much space devoted to the imperfect character of human doings (i.e. capability of error) that is repeated for so long until we lately start to think that it had long been wrong. The issue here is not to argue or show whether or not errors played any role in the course of events in our pasts. Rather, it is to develop an answer to whether they had any significance, either by way of self-reproducing or self-correcting themselves, so as to generate pathways in the life's history. This essay examines whether errors are significant in the evolutionary course of scholarly life, and if so, why. It is argued that scholarly errors are among the factors that generate intellectual pathways in which consequences of historical small events feed back up on each other positively and give rise to historical pathologies in the end. Pathways hold the intellectuals dependent on the consequences of errors which interact upon each other and prevent resulting pathologies to disappear fully. As a result, ideas do not converge to a level of perfection. Evolutionary account of errors suggests that errors in the history of ideas matter even though they are often corrected.

1. What Some Conventional History of Ideas Have Neglected

Philosophers have long elaborated on irregularities caused by erroneousness in scholarly life. According to Friedrich Hegel, history was governed by a mechanism in which dialectics constituted the principle according to which history (of philosophy) progressed from contradiction to logic. "Dialectical philosophy," Terry Pinkard argues (1988: 19), "explains the possibility of apparently incompatible categorical beliefs by trying to show that the apparent incompatibility is only apparent, that the contradiction is avoided once one expands one's framework of discourse in the appropriate way." History was self-determined to true knowledge. It ran through negativity: a proposition (thesis) was to be negated (that is, passed over into its opposite) by another proposition that was dialectically in contradiction with the former proposition and transformed into a new beginning (synthesis) which, in turn, was the thesis of a new generation of dialectical course. "What propels the dialectic is the emergence of new contradictions in the explanation that avoided the old ones, and the dialectic continues until no more contradictions emerge" (Pinkard, 1988: 19). This general "process of change" was the pathway from "abstract" to "concrete," from "possibility" to "actuality," from "falsehood" to "truth." Upon the path, contradictions and confusions were all negated one after

another. Accidents and contingencies were not part of the big story. The "process" featured necessity. It was completely teleological.

> The only requisite for the acquisition of the Scientific progression – and the very simple insight into this is what essentially concerns us – is the cognition of the logical proposition that the negative is equally positive, or that that which contradicts itself does not dissolve into Zero [Null] but essentially only into the negation of its particular content, or that such a negation is not all negation but the negation of the determinate subject-matter [Sache] which dissolves and is thus determinate negation, so that that from which is results is essentially contained in the result – which actually is a tautology, for otherwise it would be something immediate and not a result (Hegel *Science of Logic*, 1812, quoted by Rosen, 1982: 31).

Karl Popper's view on critical rationalism was based on the understanding that errors and mistakes were an essential part of scientific research. According to Popper, there was no way to avoid errors in the explanation of the unknown but science was nevertheless capable of correcting them. In order for this to happen, scientific knowledge should be able to be falsified by further evidence and testing. Scientific activity was based on "negative argument," that is, criticism and propositions that put things right (or better, truer). If a proposition was not criticizeable (i.e. falsifiable), it was not scientific. By way of criticism, more errors and mistakes in the scientific discourse could be singled out and we could pass on to new theories that featured more truth-value. What mattered was the cure – not the prevention of error (Miller, 1985: 9 – 14). According to Popper, critical rationalism was the only way for science to grow. Verification, say, couldn't be the way of attaining truth because it didn't have critical rationalist basis and it was flawed with the problem of induction: no matter how many times one observed an event, one could not provide any proof as to whether the same happening would take place next time. By way of falsification, Popper argued, that is, choosing theories that had higher empirical content or verisimilitude, one could "move forward" as false theories were thus eliminated from the intellectual sphere. Truth was an endless inquiry, requiring a critical rationalist view on new theories. (See Popper, 1945 and 1958 in Miller, 1985 and Keuth, 2005: 151 – 165.)

Imre Lakatos has provided one of the most insightful reflections on the development of scientific knowledge since Popper's *Logic of Scientific Discovery* (1959). Lakatos argues, too, that there is rational basis for progression in science. "Research programs," according to Lakatos, are progressive if and when a new theorem is an attempt to discover novel facts and provide more precise predictions about novel facts. Growth of knowledge is not necessarily a matter of accepting or refuting single theorems according to a

scientific criterion. In other words, Popperian problem of demarcation – distinguishing science from pseudoscience – is not the only problem. (It is not even an important one.) What matters is assessment of research programs in which a scientific community operates with a number of very general hypotheses – "hard core" – in terms of their ability to provide explanation about new facts. The key issue here is that new theorems must help develop new experimental techniques and provide insights about new facts. In a progressive research program, theorems do not need to pass the test of falsification (or comply with any other abstract rule). Neither do theorems need to displace another theorem. The problem is to lessen the amount (or significance) of inconsistent observations that newly accepted theorems point at. In the Popperian methodology, inconsistencies would end up with abandoning the theorem. Abandoning a research program, however, is not necessarily the only option for a forward-looking scientist who is confronted with theoretical challenges that come about as a result of the observance of new facts. In fact, it is a moral duty for scientists to face negative "crucial experiments." Solving the problems that crucial experiments give rise to, scientists are more able to achieve "problem shifts," which eventually results in cumulative progress of knowledge. When negative experiments lead to more inconsistencies – or what Thomas Kuhn once called "anomalies" – "positive heuristic" helps scientists to overcome these difficulties. Positive heuristic consists of the principles instructing scientists the path to follow in order to get them "closer to truth." Requirement for "continuous growth" in science is the following:

> There are no such things as crucial experiments, at least not if these are meant to be experiments which can instantly overthrow a research program. In fact, when one research program suffers defeat and is superseded by another one, we may – with long hindsight – call an experiment crucial if it turns out to have provided a spectacular corroborating instance for the victorious program and the failure for the defeated one … if a scientist in the "defeated" camp puts forward a few years later a scientific explanation of the allegedly "crucial experiment" within (or consistent with) the allegedly defeated programme, the honorific title may be withdrawn and the crucial experiment may turn from a defeat into a new victory for the program. (Lakatos and Musgrave, 1970: 173, italics in the original are omitted.)

To put it simply, both Popper and Hegel, among many others, such as Lakatos, supposed that big systematic forces of history, such as rationalism and dialectics, would eventually dominate the course of natural and social events in such a way that the consequences of "historical small events" (Arthur, 1989), usually in the form of small errors and contradictions in analysis, giving rise to "intellectual path dependence," would cancel out the effects of each other. Historical small events existed, according to Popper and Hegel, but their role

was only temporal and such events could not have long-lasting causal influences. At best, they could be side effects which would be canceled out one way or the other over the course of time. (For further argumentation on "historical small events," Yalçıntaş, 2009: 127 – 152.)

2. From Path Dependence into Intellectual Pathologies

As a matter of fact, a large number of events fit into their philosophical outlook. However, evolutionary theory of institutional change in general (Nelson and Winter, 1982) and the theory of path dependence in particular (David, 1985; Arthur 1994; and Pierson 2000), points out a small difference, an appendix that should be annexed to their world-view: that is, there are such occasions in history that there could never be an objective reason for the consequences of small events to disappear so easily because specificities of each circumstance might have featured feedback properties which would cause the effects of small errors to last long and grow big. As a result, "scientific advancement" is often interrupted or at least forced to follow a non-linear pathway. As Prigogine and Stengers (1984: xxviii) maintain, "the history of science is far from being a linear unfolding that corresponds to a series of successive approximations toward some intrinsic truth. It is full of contradictions, of unexpected turning points." In other words, under the conditions of path dependence, a system may lock itself into a number of evolutionary pathways in which the smoothing out of irregularities is not possible. In order to uncover the mechanisms that cause such results, one should examine every little detail. Such details are the small events, i.e. errors and contradictions, which historians have ignored and long considered irrelevant for the history of ideas.

Path dependence research includes works about the "tangled pathways of history" (Collins *et al.*, 1999), the institutional history of thinking systems (Graff, 1987) and "evolution of vocabularies" that have been locked in to specific paths (Ocasio and Joseph, 2005). John D. Sterman and Jason Wittenberg (1989) depart from Kuhn's argument (2000: 104) that "small changes … can have large-scale effects" and claim that "self-reinforcing processes amplify intrinsically unobservable micro-level perturbations in the environment – the local conditions of science, society, and self faced by the creators of a new theory – until they reach macroscopic significance." They develop a Kuhnian model of interacting paradigms in which the creation of new theories is stochastic and endogenous. According to Sterman and Wittenberg, it is positive feedbacks that

> create the self-organizing dynamic by which uncommitted and

> unorganized practitioners coalesce into a highly focused paradigm with a productive program of normal science. Through these feedbacks a successful paradigm alters its environment by suppressing the creation of competitors and rapidly starving any that do emerge of the resources they would need to succeed. The same feedback processes operate in the opposite direction during the crises period to accelerate the collapse of a paradigm which has accumulated sufficient anomalies for confidence to begin falling.

In a similar fashion, Albert Jolink and Jack Vromen (2001) argue that scientific knowledge and procedures are vulnerable to lock-in effects and multiple self-reinforcing mechanisms. Members of the scientific community use each others" results, build upon each others' work, and seek out recognition and prestige among their peers. As a consequence, Jolink and Vromen remark,

> The more scientists accept the same concepts and standards, the more attractive it becomes for those scientists to stick to their guns and for others to join the bandwagon. By the same token, with the lion's share of the community converging on the same concepts and standards, barriers to exit conventional science are erected (Jolink and Vromen, 2001).

"In all cases, error since the seventeenth century has been understood as a case of pathological belief, of credit extended recklessly or lazily or slavishly" (Daston, 2005). Our question, likewise, is the following: are errors ignorable or are they among the factors that give rise to intellectual paths and pathologies? How do errors in analyses turn into intellectual pathologies?

Path dependence, in general terms, is regarded as *blind* processes that do not consummate with a certain end-point. In epidemiology, blindness is usually considered to be a pathological situation that causes a person to lack visual perceptions (see the WHO Fact Sheet No 282, November 2004). In fact, blind processes, from a philosophical point of view, can be considered pathological, too, in the sense that, in nature and society, they lead to path dependent circumstances in which individuals practice their capability of error and capability to repeat it in the general course of events.

The manner in which "the normal" and "the pathological" are constructed in such disciplines as medicine, psychology, and sociology is crucially important in uncovering the significance of historical small events and mechanisms related to evolution (of ideas), consequences of which dominate various fields of intellectual life. Pathologies in the history of medicine and psychology often show us the central role of historical small events, usually in the form of errors and contradictions, in the making of social and economic institutions: initial conditions (errors), self-reinforcing themselves, often turn into bigger occurrences (pathologies). An error is considered to be any factor that generates formal flaws featuring hereditary interruptions and suspensions

in social processes (Canguilhem, 1991: 278). Under such conditions, harm can be truly large and radical. Errors transform into pathologies within the relation between the organism and its environment. An error is now not defined as a simplistic phenomenon, taking place only once, with predictable results. Instead, it is considered to feature complexity in the sense that linear causal relations lead the system into non-linear states generating substantial outcomes randomly.

The notion of pathologies, though, should not necessarily be imbued with a negative meaning or circumstance. The distinctive element in the notion of pathology is the positive feedback loops inherent in the evolutionary history of a specific epidemic. Intellectual paths in the institutional evolution of human ideas are pathologies in the sense that numerous self-reinforcing mechanisms magnify the effects of small causes in such a way that consequences of initial conditions are much greater for the intellectual community in the end. Whether the outcome is desirable or not is another issue.

The study of intellectual paths matters because these paths help us explain the mechanisms which disallow thinkers to diverge from pathologies in history. Had there been only a single path of modern civilization or intellectual advancement since thinkers started to ask questions about nature and society, that is, if the best-of-all-possible-worlds argument were true and we lived in such a world, we would have never been interested in the roles that small events have played in the course of history. There have been many. There have been numerous spatial and temporal paths in history, in which particularities and specificities played important roles in the course of events. Irregularities come about in such "processes" in response to assorted variables in the direction indicated by the first push. Investigations into such pathologies require more effort than deriving abstract generalizations or doing "blackboard science."

In the history of economic ideas, we detect numerous instances of error in the ways economists analyze the phenomena they live by. Errors often cause the evolution of the economic literature to "change tracks." Stanley Jevons once argued that "that able but wrong-headed man, David Ricardo, shunted the car of Economic science on to a wrong line, a line, however, on which it was further urged towards confusion by his equally able and wrong-headed admirer, John Stuart Mill" (Jevons, 1871: 45). Jevons thought that Malthus and Senior had a better understanding of "true doctrines." But the influence of Ricardo and Mill was powerful. "It will be a work of labor," Jevons claimed, "to pick up the fragments of a shattered science and to start anew." It is a hard task, he argued, though a must for those who would like to see the advance of economic science.

William Coleman correctly points at the consequences of the issue. "Instead of moving further away ("ahead") from the past," he argues, "economic thought has sometimes moved "forward into the past" as old problems recur[red], and older theories live[d] again. Thus in the 1970s, slow growth of the UK economy promoted Roger Bacon and Walter Eltis to advance classical growth like diagnoses of this sluggishness: too few producers. Similarly, the war between post-Keynesians and Monetarists in the same period was reminiscent of the 1840s controversy between the Banking School and the Currency School" (Coleman 2005). Likewise, the South Sea Bubble was repeated when Wall Street crashed in 1929. Families were torn apart at the time. People turned into beggars (Mackay, 1995: 46-88; Colbert, 2001: 13-14).

Alchemists and fortunetellers are still alive at present. They keep occupied the minds of many people who read astrology magazines. We have so long forgotten the business of witchcraft, but witchcraft remains (at least conceptually) in our daily lives. Charles Mackay's *Extraordinary Popular Delusions and the Madness of Crowds* (1852) focuses on manias, follies, and delusions in human history. He covers such issues as "The South-Sea Bubble," "The Witch Mania," and "The Slow Poisoners," about which he wrote in 1852: "We find that whole communities suddenly fix their minds upon one object, and go mad in its pursuit; that millions of people become simultaneously impressed with one delusion, and run after it, till their attention is caught by some new folly more captivating than the first" (Mackay, 1852: xv). Many have not noticed the stories of madness in the past, but we live by the consequences of idiocy, insanity, and irony such as those that Mackay mentions in his book.

And finally, Matthias van Boxsel (2004) provides numerous examples of ironies in history. He argues that stupidity is the foundation of our civilization. The best way to get rid of the terrible feeling after a stupid act, according to Boxsel, is to repeat it. This turns stupidity into a joke and makes it funny. Thus, stupidity turns into a conscious act. It is institutionalized and has become a condition for intelligence.

3. Types of Error

It is possible to elaborate on the term "error" in a number of various ways. According to Aristotle, Canguilhem argues, a monster could be an error because it intervened unfavorably in the ways in which plants and animals behaved so as to achieve harmony in nature. Error could be attributed to an objective criterion, too. For a calculator, it is a substantial error to calculate 9 as the square root of 64. Some errors are not harmful such as (some of) those made by children (Gigerenzer, 2005). When a child who has just started to speak uses "gived" instead of "gave" she is usually recognized as following a

normal and necessary developmental path. Such errors are "good errors." Sometimes, experts make good errors as well. "After the invention of the telephone," Gerd Gigerenzer reports, "a group of British experts concluded that this invention had no practical value, at least in their country: The telephone may be appropriate for our American cousins, but not here, because we have an adequate supply of messenger boys" (Gigerenzer, 2005).

We can choose from a multitude of examples from history to illustrate this point. For instance, blackness (the so-called Negro Problem) or homosexuality have for a long time been (and even still are by some) regarded as (neurotic) pathologies. What must strike the inquirer here is that cultural factors influence the way biological and mental pathologies are defined. The opposite is also true: how we define pathology influences the way the culture is constructed. In other words, there is a feedback relation between the two. Under such conditions, pathologies re-express and re-constitute the values of the society in which those pathologies are defined. In the case of homosexuality, social culture's horror of homosexuality has given rise to the efforts to "cure" the condition. All homosexuals were thought to have a common dysfunctioning. Such "pathology" caused societies to see it as the root of a number of problems, such as cultural degeneration. And this has made the examination of the pathology a more critical issue. A number of serious measures were taken in the social and cultural sphere. This intensified society's horror of sexuality and the circular logic was thus constructed.

Another illustrative example of this phenomenon is the case of defining Blackness as pathology. The result was the widespread sharing of a descriptive norm as a social norm. Benjamin Rush (1785), although a strong ally of the black-skinned population in America in the eighteenth century, claimed to have discovered a pathology that he called "negroism" or "negritude," which, Lawrie Reznek reports, was a mild form of congenital leprosy whose only symptom was the darkness of the skin (Reznek, 1987: 18). Rush argued that being a "negro" or black was a hereditary pathology. Whites shouldn't intermarry with the blacks, Rush declared, as it "would infect posterity with the 'disorder'."

In a similar fashion, Samuel Cartwright (1851) named two diseases peculiar to black-skinned peoples – "drapetomania" and "rascality." Drapetomania was a disease causing the slaves to run away. And dysaesthesia aethiopica was a disease that caused rascality, writes Cartwright,

> peculiar to negroes, affecting both mind and body in a manner as well expressed by dysaesthesia, the name I have given it, as could be by a single term. There is both mind and sensibility, but both seem to be difficult to reach by impressions from without. There is a partial insensibility of the skin, and so great a hebetude of the intellectual faculties, as to be like a person half asleep, that is with difficulty aroused

> and kept awake. It differs from every other species of mental disease, as it is accompanied with physical signs or lesions of the body discoverable to the medical observer, which is always present and sufficient to account for the symptoms. It is much more prevalent among free Negroes living in clusters by themselves, than among slaves on our plantations, and attacks only such slaves as live like free Negroes in regard to diet, drinks, exercise, etc.

When pathologies are at stake, "cumulative causation" operates in disfavor of numerous disenfranchised and minority groups. Cumulative causation, in the works of such writers as Thorstein Veblen (Veblen 1898 and 1961), Gunnar Myrdal (1997), and others, accounts for how the final effects of greater magnitude can come into existence as causes of the initial efforts. (For a general account of cumulative causation see Toner 1999.) In such causal mechanisms, components and variables respond to a change of any cause in the same direction with a follow-up effect upon the first components and variables. The causal system is dynamic in the sense that the system moves as a consequence of the cumulative effects of initial and consecutive pushes as well as the interaction between them. Variables are causally interconnected, leaving no place for the "first cause"; "everything is cause to everything else" so that the system is interlocked. Myrdal assumes interdependence between all the factors in "the Negro Problem."

> White prejudice and discrimination keep the Negro low in standards of living, health, education, manners and morals. This, in its turn, gives support to white prejudice. White prejudice and Negro standards thus mutually "cause" each other. If things remain about as they are and have been, this means that the two forces happen to balance each other. Such a static "accommodation" is, however, entirely accidental. If either of the factors changes, this will cause a change in the other factor, too, and start a process of interaction where the change in one factor will continuously be supported by the reaction of the other factor. The whole system will be moving in the direction of the primary change, but much further. This is what we mean by cumulative causation (Myrdal, 1997: 76).

Gladwell (2000) makes a similar analogy and likens the spread of social behavioral patterns to the epidemics of contagious diseases. Ideas diffuse among different social circles, Gladwell argues, just like viruses do. Epidemics "tip" – that is, the spread of virus reaches critical mass and its graph shoots straight upwards. This happens very rapidly because the virus carriers are (or at least can be) socialized into different groups among which there are powerful ties. In the 1990s it was thought that crack cocaine was the cause of the spread of HIV in New York because it led to risky sexual behavior. "It brings far more people into poor areas to buy drugs," Gladwell reports, "which then increases the likelihood that they will take an infection home with them to their own

neighborhood. It changes the patterns of social connections between neighborhoods" (Gladwell, 2000: 15). Social and intellectual pathologies (or epidemics) work in the same way. The emergence of fashion trends, the ebb and flow of crime rates, and the phenomena of word of mouth are examples in which a social pattern crosses a threshold and its expansion takes the form of "exponential overdrive" (Gladwell, 2000: 7). This may seem like a strange thought, Gladwell claims, because we are intellectually born into a conception of approximation among causes and consequences. Changes we render in social life take place steadily and slowly. "We are trained to think that what goes into any transaction or relationship or system must be directly related, in intensity and dimension, to what comes out" (Gladwell, 2000: 11). This is not necessarily the case "in the real world." Consequences are often far out of proportion to initial causes when evolution takes the form of "geometrical progression." Under such conditions, what matters are little things, like small events.

Crime is always considered to be a consequence of social injustice, structural economic inequities, unemployment, racism, and so forth and so on. If policy makers want to reduce the crime rate, they have to solve the big social problems; they have to deal with big causes. Indeed, this was what the New York Police Department and many criminologists had said was done in the 1990s when the crime rate in New York fell more than 60 percent within a decade. Policing strategies improved noticeably, they claimed. The crack trade was stopped. Employment opportunities increased.

Such changes are certainly important in increasing the quality of life of a community – but only in the long run. As a matter of fact, New York's economy didn't improve significantly between 1980 and 1990. Crack cocaine was an influential factor in the increase of crime rates, Gladwell reports, but it had already been in steady decline by the time the crime rate dipped. The reason why the crime rates declined in New York was more complicated. Big social factors couldn't account for why the rates did not fall so sharply in other cities that implemented the same social policies and why it took place in such a short time only in New York.

Gladwell argues that the "broken window theory" of two criminologists, James Wilson and George Kelling, provides the best explanation. "If a window is broken and left unrepaired," writes Gladwell, "people walking by will conclude that no one cares and no one is in charge. Soon, more windows will be broken and the sense of anarchy will spread from the building to the street on which it faces, sending a signal that anything goes" (Gladwell, 2000: 141). This is an epidemic theory of crime, saying that crime is contagious and it can start with a broken window and spread to the whole community. Gladwell shows that the problem in New York was solved by way of changing specific and

relatively small elements that served as tipping points. The authorities decided to remove all the graffitis in the subway system. This would show New Yorkers, authorities thought, that they were taking the problem seriously. The graffiti problem was considered the symbol of the collapse of the system. The authorities considered that at the heart of the problem laid the winning of the battle against graffiti in the trains. And just as they thought, such minor changes had dramatic effects on how people behaved. Authorities fixed the broken windows, cleaned up the graffiti, and removed any other signals in public places that would invite people to commit crime. The crime rate fell dramatically. After the tipping point people started to behave differently. The New York subway experiment showed, according to Gladwell, that it was "possible to be a better person on a clean street or in a clean subway than in one littered with trash and graffiti" (Gladwell, 2000: 168).

> Epidemics are, at the root, about this very process of transformation. When we are trying to make an idea or attitude or product tip, we're trying to change our audience in some small yet critical respect: we're trying to infect them, sweep them up in our epidemic, convert them from hostility to acceptance. That can be done through the influence of special kinds of people, people of extraordinary personal connection … It can be done by changing the content of communication, by making a message so memorable that it sticks in someone's mind and compels them to action … [S]mall changes in context can be just as important in tipping epidemics, even though that fact appears to violate some of our most deeply held assumptions about human nature (Gladwell, 2000: 166).

Many errors in the history of human ideas are usually trivial or self-corrective. Such "errors" do not always cause intellectual pathologies. Jevons, for instance, thought there was a connection between sunspots and business cycles, but it was soon corrected. "The Earth [was] at rest," Ptolemy thought, "it [was] in the centre of the Universe, and that fixed stars move[d] together as a sphere" (Field, 1981: 349). His astronomy was wrong but it nevertheless worked well and helped navigators produce land and sea maps using measurement and observatory techniques. It was then corrected, too. Sungook Hong reports that Guglielmo Marconi's invention of the transmission of wireless signals across the Atlantic Ocean was based upon a small error. We now know that he was wrong (Hong, 2005).

While some errors in history are harmless or even temporarily fruitful, others generate enduring paths of evolution. Many errors in history are either left uncorrected or their significant consequences linger on through time (although, occasionally, at decreasing scales). In such cases, we keep repeating the same errors. Uncorrected errors of the past sometimes generate disappointments about concrete situations in the future. Life then starts to get

more complicated and more tragic. Kenneth Prewitt (2005) argues that there are many instances in the history of social science "truths" that have lasted for centuries without being touched upon. The example he gives is a "mistake whose origin is to be found in the assumptions, preferences, and prejudices brought to the research question" (Prewitt 2005). Samuel George Morton, a nineteenth century anthropologist and zoologist, Prewitt reports, thought to have proved a hierarchy of races in which Caucasians were blessed with the most capacious array of skills and Negros as well as a number of aboriginal groups with the smallest. Morton's categorization was used to formulate the 1850 census that was introduced to determine whether or not the cross-race reproduction caused mentally defective offspring. Merton's "race science" – as well as Herbert Spancer's survival-of-the-fittest argument – resulted in many unhappy stories in the United States and Europe in the twentieth and, even, twenty-first centuries. "The social science mistake was an elementary one," writes Prewitt, "[a]s noted by Stephan Jay Gould, it was 'the claim that worth can be assigned to individuals and groups by measuring intelligence as a single quantity' (Gould 1981)" (Prewitt, 2005).

> Our issue is how to characterize this social mistake. It is obvious that neither the formulation of race-science nor its subsequent rejection can be understood solely in scientific terms – that is, by simply considering hypotheses, data, theory construction, better data, new hypotheses, theory modification, ad infinitum. Both its formulation and its rejection have to be understood as part of a larger political project: its formulation on behalf of defending slavery and sustaining racial separation; its rejection on behalf of educational programs to discredit racist thinking and government policies to compensate for past racial injustice. In this example, the inseparability of a social science theory and its political uses indicated how a science project and a political project were unfolding in tandem, resulting in a social science "mistake" (Prewitt, 2005).

Such examples suggest that some errors are significant but nevertheless temporal. That is, the consequences of errors sometimes fade away in time, causing less and less damage as time goes by. Some other errors, however, take more time for the intellectuals to realize that they have basically been locked into a pathway that was inaccurate. Such errors are reinforced by further errors and they linger on and on. The consequences are copied by themselves multiple times. In such occasions, errors are difficult to cope with. They generate significant intellectual pathologies in history.

An example of this is statistical significance tests in economics. Steve Ziliak and Deirdre McCloskey report that of the 182 papers published in *American Economic Review* during the 1980s, 70 percent did not distinguish statistical significance from economic significance and 96 percent misused

statistical significance tests (Ziliak and McCloskey, 1996). Ziliak and McCloskey have conducted the same survey for the empirical papers of the next decade, and concluded that the case had not improved. Economists have, since the 1980s, not ceased in making the same error. "Of the 137 relevant papers in the 1990s," write Ziliak and McCloskey (2004), "82 percent mistook statistically significant coefficients for economically significant coefficients (as compared to 70 percent in the earlier decade). In the 1980s, 53 percent had relied exclusively on statistical significance as a criterion of importance at its first use; in the 1990s, 64 percent did." The statistical significance tests are one of the examples of important intellectual paths in our scholarly life of economics for which setting a new path in motion has long been impossible:

> The current practice statistical significance represents a market failure in the sense that the market for published and refereed articles has failed to drive out a substandard product: the use of tests statistical significance for wrong (unscientific) reasons. Moreover, the persistence of this sub-optimal practice is path dependent, a product of the type of market which exists for journal articles and the economic and psychological costs of producing the product. The current structure of incentives is such that one cannot expect that the current wrong practices will be easily abandoned or significantly modified. We are locked in to a path of empirical practice which yields unscientific results with regards to analytical significance (Altman, 2004).

The "Coase Theorem" should be interpreted in the same vein. An error in the history of the "theorem" has turned into an intellectual pathology. In fact, Stigler's (mis-)representation of Coase's contribution could have been corrected long ago, but the "theorem" remained as Stigler introduced it in Stigler (1966) because the economics of this particular case has prevented correction from happening. Retesting the original contribution would have changed the fate of the "Coase Theorem" long ago but economists have failed to replicate the original results of Ronald Coase in 1960 and onwards because running experiments about the validity of past findings requires time and this has been the scarcest "commodity" for university researchers. The "contribution" of Stigler to Coase (1960), too small a cause in relation to its consequence, should be seen as an interruption in the systematic evolution of the "theorem." Even if some attempts towards correction had taken place, evolution may have been further disturbed and caused to follow additional numbers of diverse pathways. (For further argumentation on the "Coase Theorem": Yalçıntaş, 2010.)

Conclusion

One of the main reasons why intellectuals are hold dependent on several evolutionary pathways is that intellectuals develop habits of thought according to which they think, behave, and act. Think of it twice: Many of us like reading newspapers on Sunday mornings. We use words from a specific, limited vocabulary of pet names to address our lovers. And, historians of ideas use specific sets of metaphors to explain the evolution of the phenomenon that they are interested in. Certainly, historians' use of specific sets of metaphors is not necessarily because they do not know any others. It is rather because they are *used to* doing science with those words. A good reader of Nietzsche would immediately guess which text might belong to him because Nietzsche had chosen a specific set of words to explain philosophy. It is the same in the music of *The Beatles* and the paintings of Johannes Vermeer. An intellectual path dependency worldview suggests that we are not really entitled to begin talking about intellectual and practical problems in the terms that we are accustomed to, especially when we are more knowledgeable than past generations about the shortcomings and imperfections of the constructions that we continue to construct. Historians of economics are within the same circle: we do not need a depiction of economics expressed in the terms (and the ideology) introduced by, say, *Utopia* (Yalçıntaş, 2006). We do not need *one* theory of economics providing us with solutions to *all* the worldly problems of human societies that have existed in history and all around the globe. There should also have been no presumption that corrections in the history of economics would cure all the imperfections in and of the past (thus irreversibility). In other words, markets would often fail to fully reverse the consequences of errors because of a complex set of reasons. We should underline the fact that errors *and* corrections, considered together, are two of the non-eliminable constituents of the evolutionary history of scholarly institutions. The relationship between the two is complex: they interact upon each other and they generate further irreversible and unpredictable outcomes. For instance, the history of the "Coase Theorem" requires historians of scholarly economics to pay special attention to this case. Stigler and other authors, pointing at the error in its history, (Coase, 1991; McCloskey, 1998; Buttler and Garnett, 2003) have already caused several irreversible consequences in its evolution. Historians of economics should not report such authors as magicians touching upon simple wounds and curing them away fully. In other words, the "Coase Theorem" won't be destined toward a (fictive) stage of perfection even after various contributions correct the error and delete the negative effect of Stigler on Coase (1960). Historians of ideas should record Stigler as an important figure who played significant roles in the formulization and popularization of Coase's contribution

of the 1960s. Stigler is the one who has caused numerous irreversible consequences for the economic science.

Mark Blaug (1979: ix) states that "but equally obviously, it must be insisted, great chunks of the history of economic thought are about mistakes in logic and gaps in analysis … [mistakes which were] propelled forward by the desire to refine, to improve, to perfect." What if intellectual history has been full of errors? For many historians, this is quite "normal" because error in the making of civilizations is merely a result of the imperfect nature of human understanding. For them, errors are sooner or later corrected; more important than errors are corrections. However, the path dependent evolution of institutions suggests that self-correction processes are often complex and that there is no guarantee that corrections would waive all of the irreversible effects of the past with a finger snap. In other words, every error amounts to a compromise (small or big) in the continuity of history where the success of social and intellectual projects relies on uninterrupted maintenance of ongoing scholarly conversation and empirical back-ups in old theories. When errors do not disappear easily and without causing further trouble, they make a long lasting idea in history impossible – the idea that perfection in the world of scholars is achievable.

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