

Why were biological analogies in economics “a bad thing”?

Edith Penrose’s battles against social Darwinism and McCarthyism

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Argument

The heuristic value of evolutionary biology for economics is still much under debate. We suggest that in addition to analytical considerations, socio-cultural values can well be at stake in this issue. To demonstrate it, we use a historical case and focus on the criticism of biological analogies in the theory of the firm formulated by economist Edith Penrose in post-war United States. We find that in addition to the analytical arguments developed in her paper, she perceived that biological analogies were suspect of a conservative bias – as in social Darwinism. We explain this perception by documenting the broader context of Edith Penrose’s personal and professional evolution, from her student days at Berkeley to her defense of Owen Lattimore against McCarthyism. We conclude that in the case under study at least, science and values were certainly intertwined in accounting for her skepticism towards biological analogies – insight we develop in the conclusion about today’s relationships between biology and economics.

Introduction

Until relatively recently, contacts between economics and evolutionary biology were quick to be deemed controversial, as when Chicago school economists explored the lessons of sociobiology for human economic behavior in the 1970s. The atmosphere has considerably cooled off since then, but there are still bouts of name-calling when an economist choose to rely on biological evolution to develop theoretical constructs in her own discipline (for a recent example, see the symposium on Gregory Clark's *A Farewell to Alms* [2007] in the August 2008 issue of the *European Review of Economic History*).

More substantially, there is also an unsettled debate over the heuristic value of models derived from evolutionary biology to represent economic change – the domain of study of evolutionary economics. A recent exchange between evolutionary economists is typical of the apparent dead-end reached between the skeptics and promoters of biology-inspired theories in this subfield of economics. Richard Nelson, although one of the founding fathers of evolutionary economics, judged that one should preferably not take theories developed in evolutionary biology as one's starting point, and then try to make empirical phenomena in economics fit their constraints. It would be a “much sounder and more promising position ... to pay close attention to the empirical phenomena one is theorizing about, and the actual processes that seem to be at work, and develop one's theory around one's understanding of these ...” (Nelson 2007). To which his opponents in this debate, economist Geoffrey Hodgson and management theorist Thorbjørn Knudsen, replied that “it is a much sounder and more promising position to develop testable hypotheses from a theory that adequately captures the stylized features of the processes we wish to understand.” (Hodgson and Knudsen 2007). We contend that this frontal divergence of views is typical and seems unlikely to be solved through analytical arguments. What makes for such a persistent soul searching about the role of evolutionary biology in economics, and can it be further understood by probing the nature of the interdisciplinary relationship between economics and biology?¹

Exchanges between economics and biology have been investigated from a variety of angles. In connection with the linguistic turn in philosophy of science, several nomenclatures of biological analogies and metaphors have been imagined, and their relative merits have been assessed by methodologists of economics (Khalil 1998; 2000;

Klamer and Leonard 1994; Morgan 1995; Vromen 1995; Cohen 1993; Hodgson 2002). At stake is the precise characterization of the biological analogies under discussion. “Evolutionary” thinking encompasses both ontogenic and phylogenic evolution, and within the class of models of phylogenic evolution one can pick among Lamarckian, Weismanian and / or Darwinian processes, to start with (Hodgson 1993; Hodgson and Knudsen 2006). Naturally, practitioners of evolutionary economics are also active in the discussion, instantiating their claims by elaborating models and narratives and by debating on which approach seemed to capture best economic change (Witt 2005). Yet, these different perspectives do not address directly the question of why there is so little agreement on the heuristic value of biology for evolutionary thinking in economics. In order to achieve a better understanding of how evolutionary theories imported from biology to economics come to be embraced or doubted about, we suggest that a look back at a particular critical discussion of evolutionary thinking in economics will be fruitful. The contextualized examination of the most articulate criticism of biological evolutionism in economics, formulated in the middle of the twentieth century by Edith Penrose (1914-1996), provides a convenient ground to ponder what can motivate a skeptical stance towards interdisciplinary contacts, and what sort of arguments are at play. Here, the historical and contextualized method of investigation – instead of say, the analytical approach that has been favored so far - yields practical and substantial benefits. From a practical point of view, the historical distance between the topic studied here and our contemporary concerns plays the role of a protective buffer, which permits to explore questions about the interplay between the social and scientific that would surely not be as accessible were we to ask contemporary economists and biologists.² Second, the

reexamination of Penrose's critical view on biological analogies represents an exercise in the deconstruction of the "canon" of the discipline – widely shared views on the origins of evolutionary economics based on the interpretation of founding texts, framing today's perceptions of the identity of the field and what are its "natural" boundaries. Penrose is today most often remembered as the theoretician of an organic theory of the growth of the firm.³ Reconstructing her portrait by adding more dimensions to it will invite to revisit today's entrenched views on one episode of the founding of evolutionary economics, and flesh out new perspectives for its future development.

Published in 1952 in the *American Economic Review*, Edith Penrose's "Biological Analogies in the Theory of the Firm" criticized three different instances of biological analogies in the contemporary theory of the firm. Two such analogies had been developed by Kenneth Boulding, the unorthodox economist interested in ecological and organic metaphors in social science. The third biological analogy targeted by Penrose was UCLA economist Armen Alchian's concept of "economic natural selection" which compared economic competition to a Darwinian process, a landmark paper which triggered a renewed interest in evolutionary thinking in economics.⁴

Philosophical studies discussing Penrose's article most often take Alchian's article as their departure point, and present her criticism of biological analogies as a sparring partner for Alchian's argument (Lagueux 1993; 1998; Vromen 1995). Another thread of literature struggles to find a methodological coherence between Penrose's critical stance toward biological analogies and her theory of the growth of the firm, many finding ironical that "her own work is very much consistent with evolutionary economics".⁵

Indeed, Penrose had made clear that she would retain an important element from biological theories in her own version of the theory of the firm:

[T]he growth approach has so far been expounded in any systematic form only by the ‘biological economists’ [Armen Alchian and Kenneth Boulding – CL] – by those who view firms as organisms and conclude that they grow like organisms. That variant of the growth approach leaves no room for human motivation and conscious human decision and I think should be rejected on that ground. [...] I want here to suggest an alternative growth approach which, *in common with the biological variant*, insists that a predisposition to grow is inherent in the very nature of firms, but which, in contrast, makes growth depend on human motivation – in the usual case on the businessman’s search for profits. (our emphasis) (Edith T. Penrose 1955, 531).

In other places in her works discussing the theory of the firm, there is indeed the feeling that Penrose could have easily built upon the most celebrated biological analogy by British economist Alfred Marshall, who compared the dynamics of growth and eventual decay of firms in an industry to the cycle of growth of trees in a forest (compare Edith T. Penrose 1959a, 7-8 with Marshall 1920, 316-317). The contemporary appeals of using biological analogies to develop a theory of organic (endogenous) growth is also clear from the writings of American economist Allyn Young, who wrote a theoretical exposition of the growth of businesses in an explicitly analogical fashion, and on which Penrose relied to further her own theoretical arguments (Young 1928; Young 1999; Edith T. Penrose 1959a, 71).⁶ It makes it all the more meaningful and curious that Penrose devoted a full piece of her writing targeting biological analogies in particular.

Much later in her life, Penrose seemed to be less and less critical of biological analogies, praising now “the growth of evolutionary thinking in economics generally” (Edith T. Penrose 1995), citing the works of Richard Nelson, Sidney Winter and Geoffrey Hodgson in illustration. To the latter, she confided that she “had revised her opinion. She was deeply fascinated with evolutionary and other explanations of human consciousness. She did not take human deliberation as given or for granted” (Hodgson 2004a, 191).

It would then seem that Penrose’s intellectual evolution paralleled in certain ways the evolution of the relationships between social science and biology in the post-war period: from a staunch opposition to a much more conciliatory attitude. It might then pay to have a closer look at the broader intellectual climate in which Penrose wrote her contributions, in order to provide a more detailed explanation to the “decomposition and growth” of biological thinking in economics (Hodgson 2005). We do not pretend that Penrose’s stance vis-à-vis biological analogies was dictated by the political and social circumstance she lived in, and in any case we lack any direct evidence pointing in this direction. Nor do we suppose that this micro-history should play the role of a rigid template explaining other instances of affection or disaffection for biological analogies. More modestly, we will make the case that the story of Penrose shows how the social, political and scientific levels were densely interrelated in her life at the time when she wrote her criticism of biological analogies in economics, suggesting that such dimensions might also play a role in today's good and bad fortunes of interdisciplinary contacts between biology, economics and social sciences in general.

A brief survey of Penrose’s 1952 article and its received view will establish that a central argument of her paper, namely that biological analogies project a conservative bias, has

been consistently ignored. Next, we will discuss how this argument built on the concept of “social Darwinism” of contemporary fame, substantiating our claim that many different layers – social, scientific and political – were standing in the background of her rejection of biological analogies. We will then examine elements of Penrose’s biography to understand why conservatism was a matter of special concern for her at that time. In conclusion, we will reflect on the possibility to pin down a clear link between the intellectual climate of an epoch and contemporary developments in theorizing. Finally, a coda presents a last significant insight on how intertwined personal, political and professional matters were for the Penroses at the time.

Penrose on analogies

Penrose's 1952 paper is original in several respects. Published in the flagship journal of the American Economic Association, it presents itself as "not so much concerned to present an analytical critique of the theory" than a discussion of methodological issues related to the value of analogical reasoning in economics (Edith T. Penrose 1952, 811). In a period when the neoclassic orthodoxy was strengthening in economics and allowing for a diminishing measure of pluralism, major journals still accepted papers on methodological issues from time to time, as in the case of the debate over mathematic formalism in economics (Morgan and Rutherford 1998). Nevertheless, the discussion of analogies in science remained an oddity. Reflections about the linguistic and rhetoric dimension of the scientific discourse would only flourish ten years later with the publication of philosopher Max Black's *Models and Metaphors*, and later still in economics (Black 1962; McCloskey 1983). Hence, Penrose's analysis of the two functions of analogies had some pretense of originality. She distinguished between a first function of analogical reasoning, which consists in comparing a well known series of events to the events in need of explanation. For such an analogy to carry explanatory value, "there must be some reason for believing that the two series of events have enough in common for the explanation of one, *mutatis mutandis*, to provide at least a partial explanation of the other" (Edith T. Penrose 1952, 807). This, Penrose would argue, was not the case for biological analogies in the theory of the firm. Analogies between biological organisms and social entities tend to leave out of the picture the fact that intentionality plays a determinant role in the social realm. Conscious motives, such as the striving for profits by entrepreneurs, are a cardinal factor of explanation in any theory of

the firm, and should not be left out of the analysis simply because a biological analogy would not make room for it. Rather, argued Penrose, this is a sign that the biological analogy should be discarded. This argument is upheld by philosopher Maurice Lagueux, who concludes that without an analysis of intentionality, social sciences would surrender their *raison d'être* to the natural sciences (Lagueux 1998, 179-180).

A second function of analogies is at work when “resemblances between two phenomena are used to add a picturesque note to an otherwise dull analysis and to help the reader to see more clearly the outlines of a process being described”. Penrose acknowledged that this kind of analogies is indeed “indispensable to human thought,” (both quotes from Edith T. Penrose 1952, 807) but denied that biological analogies as deployed by Armen Alchian and Kenneth Boulding were of this innocuous sort. In Alchian’s economics natural selection just like in Boulding’s ecological interpretation of social forms, it would appear that the analogy provides indeed a necessary scaffold, or even the foundations, for their conclusions.⁷

The interesting issue of the epistemological validity of analogies should not let us forget a related issue discussed by Penrose, namely the conservative dimension of biological analogies in social science.

The meaning of Social Darwinism in 1952

In her article, Penrose pointed repeatedly to undesirable consequences of using biological analogies:

To abandon their [firm’s] development to the laws of nature diverts attention from the importance of human decisions and motives, and from problems of ethics and

public policy, and surrounds the whole question of the growth of the firm with an aura of “naturalness” and even inevitability. (Edith T. Penrose 1952, 809).

The role of biological analogies in social thought has been widely discussed by historians in connection with the historiography of social Darwinism (Hofstadter [1944] 1992; Bannister 1979; Bellomy 1984; Degler 1991; Hodgson 2004b; Leonard 2009). “Social Darwinism” usually refers to evolutionary arguments in defense of laissez-faire economics, imperialism, eugenics, racism, and other views held by intellectuals who do not share the reformist agenda typical of the Progressive Era. In many people’s eyes, social Darwinism is simply a “Bad Thing”, commented ironically historian Robert Bannister. Since the 1970s however, scholars studying social Darwinism have pointed that Progressive intellectuals (such as sociologist Lester Ward or institutionalist economist John Commons) resorted to evolutionary arguments as much as the so-called social Darwinists, and later historians documented that the Progressive movement was also impregnated with racist and eugenic conceptions deemed typical of their opponents, while the usual suspects of social Darwinism (Herbert Spencer and Graham Sumner) did not defend all the conservative views attributed to them. As a result of this hopeless confusion, it is today widely agreed that social Darwinism is more misleading than helpful as a terminological innovation for historians to work with.⁸ But in 1952, at the time of the publication of Penrose’s article, all these historiographical nuances were yet to surface. She referred simply to the presentation of social Darwinism that was widely available at the time, which was Hofstadter’s *Social Darwinism in American Thought* published in 1944.

In this book, Hofstadter examined the use of biological analogies such as “the survival of the fittest” in the social thought of prominent intellectuals of the Gilded Age and the Progressive Era (about 1870-1920). His overall conclusion was unambiguous:

Whatever the course of social philosophy in the future, however, a few conclusions are now accepted by most humanists: that such biological ideas as the ‘survival of the fittest,’ whatever their doubtful value in natural science, are utterly useless in attempting to understand society; that the life of man in society, while it is incidentally a biological fact, has characteristics that are not reducible to biology and must be explained in the distinctive terms of a cultural analysis [...] (Hofstadter 1992, 176).

Bellomy and Hodgson have demonstrated the large influence of Hofstadter’s book not only in terms of increasing the popularity of the expression “social Darwinism,” but also in the matter of decisively shaping the accepted definition of it. Hodgson’s bibliometric study shows that “social Darwinism” was a label which was scarcely used in Anglo-Saxon academic journals – in fact, a mere *nine* times were recorded prior to 1914 in his search in the JSTOR database (see Figure 1).

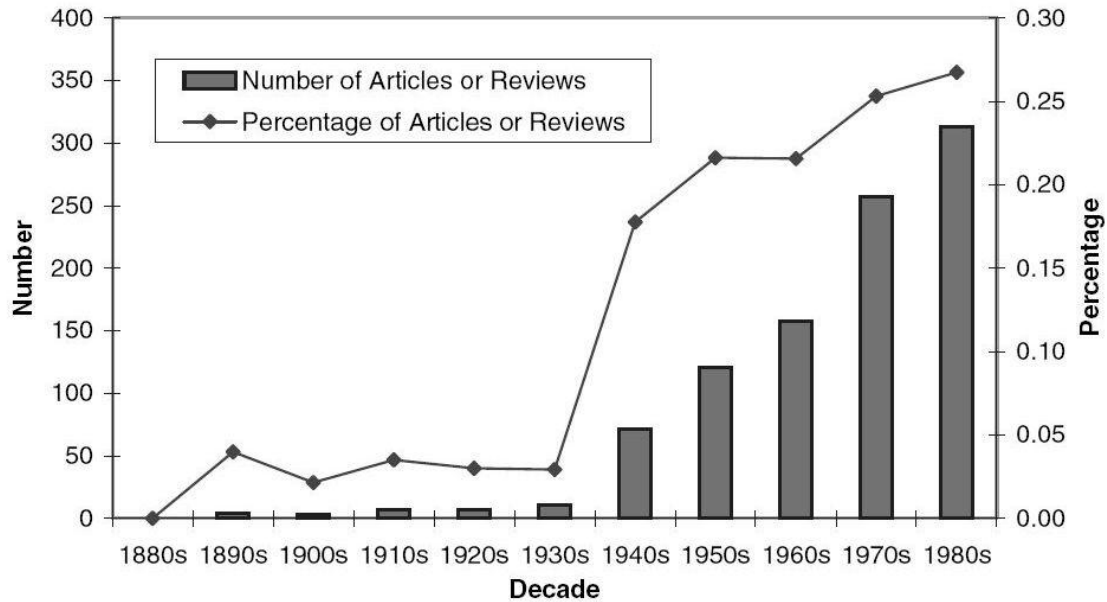


Figure 1 - Reproduced from Hodgson (2004b, 236)

In parallel, Bellomy shows that it is Hofstadter’s book which solidified the evasive concept of social Darwinism – notably by identifying Herbert Spencer and Graham Sumner as the main figures of this intellectual “movement,” and by portraying Lester Ward as their “critic.” It is then of significance that Penrose based her appreciation of the social value of biological analogies on this influential book – this reference signaling a shift from purely analytical grounds to an appreciation motivated by cultural and social concerns. Mentioning the “aura of naturalness” which is brought by biological analogies to economic issues, Penrose refers to Hofstadter’s authority in a long footnote:

See the discussion in Richard Hofstadter, *Social Darwinism in American Thought* (Philadelphia: University of Pennsylvania Press, 1944) pp. 30ff. and the quotation (p. 31) he gives from John D. Rockefeller: “The growth of a large business is merely a survival of the fittest ... The American Beauty rose can be produced in the

splendor and fragrance which bring cheer to the beholder only by sacrificing the early buds which grow up around it. This is not an evil tendency in business. It is merely the working out of a law of nature and a law of God.”⁹

At another place, Penrose establishes a connection between the archetype of social Darwinism, Herbert Spencer, and any use of biological analogies:

The analogy [Alchian’s economic natural selection] I am concerned here avoids the crudities and attempts to avoid the value judgments that characterized the 19th century doctrine of Spencer and his followers in their application of these principles [biological evolution and natural selection] to society. It is very modern in its emphasis on uncertainty and statistical probabilities. Nevertheless, it is open to the same basic objections that in my opinion adhere to all such biological analogies.

(Edith T. Penrose 1952, 809-810).

It is a most diplomatic way to affirm that economic natural selection is fundamentally not so different from the social Darwinism of Spencer. This establishes that Penrose’s rejection of biological analogies were also grounded in a socio-cultural evaluation echoing a contemporary and popular pronouncement. This would not be surprising, since this micro-history would merely confirm a trend that has been well identified at the macro-level. Historians have contended that the demise of evolutionary thinking in mid-century social thought was due at least as much to transformations of the American society as to advances in the scientific realm. In the interwar period and during the Second World War, American identity reshaped itself from ethnic-based conceptions – looking for the true nature of the American “stock”, to an ideological definition – where being American was above all about adhering to a certain creed. This transition caused a

general receding of evolutionary explanations in social science, because they placed the nature and destiny of human groups out of reach of social and political reform, and were even at a superficial level too reminiscent of the biologically inspired ideologies of the nazi and fascist states.

Since her personal philosophical beliefs as well as analytical principles were at stake in Penrose's rejection of biological analogies, does it entail that this rejection was ill-founded? We rather think that this situation calls for an examination of the philosophical beliefs in question. In this way, we will achieve a precise understanding of how analytical and philosophical motives converged to make biological analogies a quasi taboo in social science in the middle of the twentieth century.¹⁰

The values of Edith Penrose

Edith Elura Tilton was born on 15 November 1914 in Los Angeles.¹¹ She grew up in a “close and supportive family.” Her father was a road engineer and the family followed him as he traveled for his surveys of the road network of California, before eventually settling in at San Luis Obispo. Her mother had an independent, affirmative personality, traits that would later also be typical of Edith's character. Edith entered the University of California at Berkeley and according to an interview she gave in the early 90s, she first experimented with “jurisprudence, philosophy, history, [and] psychology but eventually choose economics because this was the period of the great depression and the economy was in severe trouble. So I chose economics as the most interesting and relevant subject” (Parkin and King 1992, 187). During her studies, Edith Tilton was much

involved in the Forensics Council, representing her university in local tournaments with debates on such themes as “Is there a possibility of a third political party in the United States?” or “Should the Townsend Plan [an ambitious social security plan] be adopted?” (see Figure 2). Beyond an ability to defend her arguments and knowledge of rhetorical artifices, it testified to an appetite to voice her opinion on matters of public interest.



Figure 2 - Edith Tilton, Commissioner of the Forensics Council (University of California at Berkeley Year Book 1936, p. 238).

In 1934, she married David Burton Denhardt, a fellow student at UC Berkeley (class 1933). After receiving her B.A. in economics in 1936 she moved with him to northern California. There, she took a job as a social worker with a Depression Relief agency while her husband began working as a lawyer and an aspirant district attorney.¹² But in 1938, David B. Denhardt was killed in a hunting accident – Edith was four months pregnant with their first child (Perran Penrose and Pitelis 1999, 4). Her life took then a

different turn when, back to Berkeley to study, she met Ernest F. Penrose, a professor of economics there. Like Edith, he “came from a relatively humble background.” Born in Britain, he “had served in the trenches during the First World War, and had managed to finance himself through Cambridge after the war, and had come to Berkeley from Japan through the Stanford Food Institute” (Perran Penrose and Pitelis 1999, 4), acquiring the American citizenship in 1937.¹³ Edith and Ernest Penrose moved in 1939 to the siege of the International Labour Office (ILO) in Geneva, at the suggestion of its newly appointed director John Winant. Winant was a figure of the New Deal, a long time Republican governor who had been chosen in 1935 by Franklin Roosevelt to head the Social Security Board, and resigning in 1936 during the presidential campaign only “so that he could better defend the new program, alongside Roosevelt, from criticisms by the Republican party” (Freedman 2000). A man with a reputation of great humanity and rightness, he had a deep concern for social justice and human rights, which he saw as the fundamental root to peace, “ahead of property rights.” (Lorenz 2001, 129). Edith and Ernest Penrose worked as economic specialists and advisors for Winant for 1939-1941, Edith publishing reports on the impact of war on the food and textile industries (Edith Tilton Denhardt 1941; 1943).¹⁴ The active concern of the Penroses for social distress, which appears in watermark all along their careers, is highlighted during their stay in Geneva by the help they provided to people escaping the nazis.¹⁵ In 1941, when Roosevelt sent Winant to London as US ambassador to the UK, Edith and Ernest Penrose followed him as economic adviser (Ernest) and special assistant (Edith). Ernest was closely involved in the discussions between J.M. Keynes and Harry Dexter White, the Assistant to the Secretary of the Treasury who was in charge of the negotiations leading to the Bretton

Woods conference. The couple followed Winant again when he later moved to the US delegation for the Economic and Social Council of the United Nations in 1947, before finally relocating to the campus of Johns Hopkins, where Ernest Penrose had obtained a chair in Human Geography. Edith Penrose earned a Masters degree then a PhD in economics with Fritz Machlup, studying the history of the patent systems. She then moved to her study of the theory of the growth of firms, while lecturing for the department of economics (Machlup and Edith T. Penrose 1950; Edith T. Penrose 1951). The death of Roosevelt in April 1945 marked a radical shift in American's foreign and domestic policy. During the war, Roosevelt had been keen on considering the Russians as allies, investing a large amount of trust and goodwill in their relationships. This came to an abrupt end with Harry Truman's presidency. Inexperienced in foreign affairs, and lacking empathy for the Russians, Truman suddenly converted the American's position from a posture of dialogue and prudent cooperation to outright defiance and threat (Chafe 1995; Miscamble 2007). Economists like Ernest Penrose who had implemented the agenda of Roosevelt's policies became branded as "New Dealers" suspected of sympathy for the communists or even of being Soviet agents in the eye of the new administration and secret services – sometimes for good reasons (Haynes and Klehr 1999). In a few years, many senior economic officials became judged undesirable or were prosecuted for their sympathies to communism, with the consequence to empty the corridors of Truman's administration of their presence. In the professional network of the Penroses, Harry Dexter White and others directly felt the turn in the events.¹⁶ This political turn had direct consequences on the Penroses as well.

Edith Penrose and The Lattimore Defense Fund

In March 1950, on the floor of the U.S. Senate Joseph McCarthy accused Professor Owen Lattimore, a member of the Johns Hopkins faculty, to be the top Soviet espionage agent in the U.S., adding that his [McCarthy's] anti-communist crusade rested wholly on Lattimore's case (Evans 1977; Newman 1992; Lewis 1993). This led to the opening of an investigation by the Subcommittee of the Committee for Foreign Relations, which held its first hearing of Lattimore on April 6, 1950.

Edith and Ernest Penrose had close ties with Lattimore. Like Lattimore, Ernest Penrose had served in top positions in the foreign policy arm of Roosevelt's administration with Harry Dexter White, and both had spent several years living in the Far East, which also defined their academic interests.¹⁷ Ernest Penrose was a specialist of Japan where he lived from 1925 to 1930, while Lattimore was the leading authority in Mongolian studies, and an expert on China. After the Penroses's arrival at John Hopkins in 1947, much "was expected to grow out of [Ernest Penrose's] relation to the Walter Hines Pages School of International Relations as he works with Owen Lattimore," and the two families became social friends.¹⁸ But with Lattimore under attack, the relation with the Penroses turned to one of assistance.

On April 20, 1950, Ernest Penrose wrote a letter to the *Baltimore Sun* in support of Lattimore, expressing his conviction that accusations against him would turn out to be false, as they had been in the case of William Remington, an economist in the government accused of being a communist and who was subsequently completely vindicated and reinstated, argued Penrose.¹⁹

The costs for the defense of Lattimore, even with a law firm accepting to serve for free, were to run very high, with a procedure which eventually lasted more than five years

before all the charges against Lattimore were dropped. At the initiative of George Boas, a professor of philosophy at Johns Hopkins, a “Lattimore Defense Fund” was set up in January 1953 with the goal to gather funds to pay for the legal fees. Edith Penrose was nominated secretary of the fund, a position which reveals to what extent she perceived that not being passive and to speak up was necessary in the context of conservative threats to academia (Figure 3). The funding drive was a success - ultimately, \$38,000 were collected through nearly 2000 contributors, and all the charges against Lattimore were finally dismissed in June 1955.²⁰

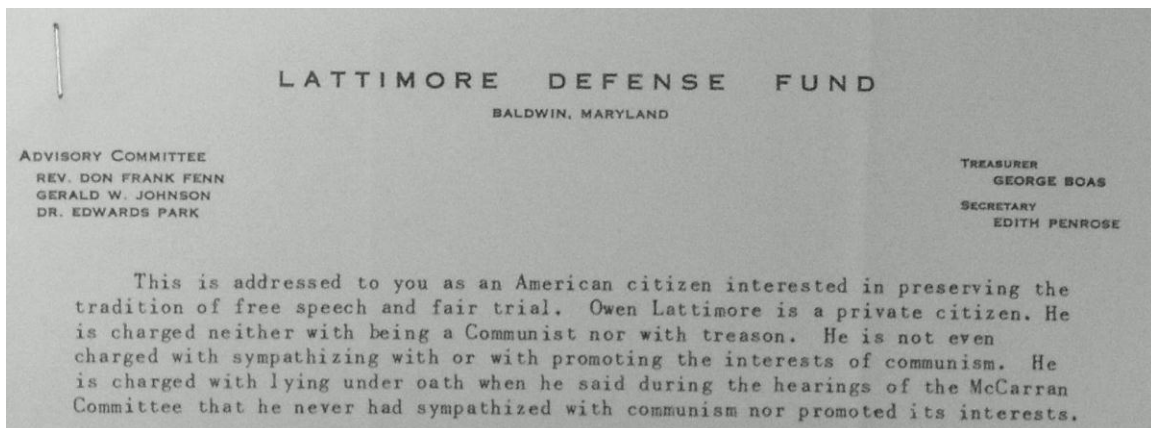


Figure 3 – Header of the letter sent to seek financial support for Owen Lattimore. This copy was attached to a letter from Fritz Machlup to Kenneth Boulding sent February 1st, 1953. Box 77, Folder 5 "May 1953", Kenneth Boulding Papers, Bentley Library, Univ Michigan at Ann Arbor.

This position in the Lattimore Defense Fund came with considerable risks for Edith Penrose, as the creation of the fund had triggered the opening of an investigation by the FBI, in which any sign of political left-leaning was taken as indicting evidence.²¹ Indeed, a few months after the creation of the Lattimore Defense Fund, the Penroses were called

to testify in an executive session on “Internal Security – Subversion in the School System” before the Senate Internal Security Subcommittee chaired by Senator William E. Jenner, a staunch supporter of McCarthy. Testifying came with considerable pressure to “naming names.” The choice to name names or not was a particularly distressing experience, as it entailed balancing the betraying of friends and personal convictions with the prospect of losing one’s job or worse if one refused to (Navasky 1980). For the Penroses, the transcript of their testimony shows that they were asked a series of questions about communist “front” organizations on the UCLA campus in the late 1930s, to which the Penroses did not answer with any precision, invoking their lack of knowledge and memories on the matter. The Penroses walked away from the hearings without further trouble, assured that no publicity of their hearing would be given. This traumatic experience of confrontation with Mccarthyism, which threatened the Penroses in their private and professional lives, lasted from 1950 to 1953 and beyond (see the coda to this essay). It gives a better sense of Edith Penrose’s wariness with respect to the conservative turn in academia in post-war America – which has been felt by many other Keynesian or institutionalist economists of her generation (see for example the testimonies of economists Paul Samuelson [*in* Colander and Landreth 1997] and John Galbraith [1982]).

Conclusion and coda

The professional experience of Edith Penrose at the International Labour Office as well as the web of her familial, personal and professional connections to personalities

threatened by the conservative turn represented by Truman's administration and McCarthyism all shed light on the defiance towards conservatism expressed in her "Biological analogies and the theory of the firm" in 1952. At the time of the writing of her contribution, Edith Penrose was directly experiencing in her personal life the conservative turn in the intellectual climate at the national and international level. In this context, the interpretation of all biological analogies as a cases of social Darwinism, à la Richard Hofstadter, may have made considerable sense to her: through this lens, the reintroduction of evolutionary and organic analogies in economics rooted competitive market economies in nature, implying by fallacy that social reforms so typical of the New Deal welfare state should be considered a potential disturbance and nuisance to this natural economy. Under this light, biological analogies in economics were inherently suspect of supporting the "status quo", for this motive they should be fought against (Penrose 1952, 809). This essay argued that this stance might have reflected intimate personal values, but one should also note that it fitted a widely shared worldview at the time. As cultural historian Carl Degler has remarked, the reformist spirit since the Thirties was all infused with a "wish to establish a social order in which innate and immutable forces of biology played no role in accounting for the behavior of social groups"²² – a progressive credo which was at the core of Penrose's battles against biological analogies in economics and McCarthyist attacks on her campus.

This historical note provides further support to studies of the interactions between personal values and theorization work in economics (Samuels 1977; Cherrier 2008): as Beatrice Cherrier has established, there are cases when there exists a "lucky consistency" between the values of an economist and his or her scientific results. Similarly, we find

that the rejection of conservative biological analogies by Edith Penrose is consistent with her denunciation and engagement against political conservatisms, both having in common to be antagonistic to her faith in social reform and progressivism. This concomitance should not be read as an indication of a faulty methodology; rather, “cognitive and political values provide *substantive* hypotheses on the world that influence research, [and] methodological choices shape the *channels* whereby these values actually enter the theorizing process and survive the confrontation with facts.” (Cherrier 2007). In Penrose’s view, biological analogies did not qualify as a proper methodology in economics – hereby revealing the alignment between her own methodological preferences and personal values.

In the past few years, interdisciplinary contacts between economics and biology have diversified: analogical reasoning has been complemented by the proposal of “generalization” as a mode of unification between the two disciplines (Aldrich et al. 2008), and also by the increasing development of joint team work by biologists and economists in neuroeconomics (e.g., Pine et al. 2009; Krajbich et al. 2009). At face value, these new forms of interdisciplinary science should prove more impenetrable to extrinsic influence – because of the ambitions of a strict logical construct represented by “universal Darwinism”, or thanks to the straightjacket of an experimental program – both meant to display a rigor which analogies lacked. Alternatively, these methodological developments can also be considered as new channels through which values will not be annihilated, but will flow along different, uncharted paths. In which case, and in relation with the social and political climate of our times, we should expect more, not

fewer episodes of contestation targeting the exchanges at the fluctuating border between economics and biology.

Coda

McCarthyism died out slowly in 1955-1958 with several decisions by the Supreme Court reinstating some basic defense rights to the individuals suspected of being communists (McCarthy himself died in 1957). However, some of the central features of McCarthyism remained firmly in place.

In 1958, while on leave to Baghdad University with Edith, Ernest Penrose applied for a position with the United Nations, which triggered the opening of an investigation by the FBI.²³ FBI special agents interviewed Ernest Penrose's current and past colleagues, neighbors, employers and their local contacts from the American Legion. They were quick to find that in 1953 one of their informants had "advised [them] that Mrs Ernest T. Penrose, wife of Dr. Ernest Francis Penrose, was observed by the informant forwarding letters soliciting funds for the defense of Owen Lattimore."²⁴

The FBI unearthed some other damaging elements, but the association with Lattimore figured centrally in the synopsis of the final report sent to the Civil Service Commission, in charge of assessing the loyalty of applicants for the International Organizations Employees Loyalty Board.²⁵ The investigation also found that the Penroses had been called to testify before the Jenner Committee in March 1953. Internal memos show that FBI agents also got access to the content of the hearings, supposedly held in secrecy. Ernest Penrose's "testimony contains no admissions of communist activity but does

reflect background data and possible evasiveness in answering questions re communism” (Office Memorandum from [name concealed] to A. Rosen, December 1st, 1958, Penrose file). Despite the reassuring words by Senator Jenner at the time that “there [would] be no publicity concerning this meeting,”²⁶ an unidentified source “stated that there would be no objection to disseminating Penrose’s testimony to the Civil Service Commission. [The unknown source] asked that it be given the same security as our reports, or, in fact, made part of a report.”²⁷ Unsurprisingly, after receiving the report on Ernest Penrose in January 1959, the Civil Service Commission indicated that the United Nations had stopped considering him for employment (see Appendix). Still in Baghdad at that time, the Penroses finally moved to England, where they had already two of their sons in schools. Edith “successfully applied for a joint readership in economics with reference to the Middle East at the London School of Economics and the School of Oriental and African Studies (SOAS)” (Perran Penrose and Pitelis 1999, 6) and one year before the expected date, Ernest Penrose retired.

Appendix

g
TAC 2/20/59
UNITED STATES CIVIL SERVICE COMMISSION

WASHINGTON 25, D. C.

DATE: February 3, 1959

FILE: ILB:uhm

TO: Director
Federal Bureau of Investigation
Washington 25, D. C.

6- [redacted] b6 b7c

NAME PENROSE, Ernest Francis (138-4400)		DATE OF BIRTH January 26, 1895
<input type="checkbox"/> EMPLOYEE	INTERNATIONAL ORGANIZATION AND LOCATION	
<input checked="" type="checkbox"/> APPLICANT	United Nations (SYG), New York, New York	

Your Bureau conducted investigation in this case under provisions of Executive Order 10422, as amended. The disposition made of the case by the International Organizations Employees Loyalty Board is indicated below:

STATISTICS TAKEN
FEB 27 4 10 PM '59
STATISTICAL SECTION

A favorable advisory loyalty determination was forwarded to the head of the above international organization.

An unfavorable advisory loyalty determination was forwarded to the head of the above international organization.*

A summary report of derogatory suitability information, other than loyalty, was forwarded to the head of the above international organization.

Resigned or otherwise separated from employment or withdrew from consideration prior to a decision (see explanation below).

The United Nations advised February 2, 1959 that Mr. Penrose is no longer being considered for employment with that organization.

Fredrick W. Green
Executive Secretary
International Organizations
Employees Loyalty Board

cc AAG

*Disposition by the international agency has been requested. Your Bureau will be notified of final action.

138-4400
NOT RECORDED
MAR 3 1959
STAT. SECTION
Lowell

MAR 3 1959

USCSC--WASHINGTON D C

90-1/55

Figure 4 - The final decision by the UN regarding Ernest Penrose' application (Penrose file, closing page).

Notes

¹ Our focus here will be on the theoretical relationships between economics and biology, without considering the interdisciplinary relationships based on shared empirical and experimental work (as in the case of neuroeconomics). Another problematic aspect of interdisciplinary relationships between economics and biology is the imperialist attitude which these two disciplines oppose to each other. On the (lack of) validity of imperialist claims by biologists over social sciences, see Suplizio (2006) and Jackson (2010); see Dupre (1994) on both economics and evolutionary biology imperialisms.

² This is not because today's scientists would have nothing to say about the broader context of the formation of their theories. Rather, they tend to perceive the discussion of this context as threatening their claims to objectivity (Latour and Woolgar 1986 [1979]).

³ See the contributions included in vol. 18 of *Contributions to Political Economy* (1999) and vol. 29 of *Economies et Sociétés* (1999). More recently, Penrose has been acknowledged as one of the main inspirations to the resource-based view of the firm (Kor and Mahoney 2004; Rugman and Verbeke 2002; Rugman and Verbeke 2004; Lockett and Thompson 2004).

⁴ Alchian (1950), Boulding (1950). On Boulding's ecological vision of economics and social sciences, see Philippe Fontaine (2010). On the Cold war context of the introduction of a biological analogy in economics by Armen Alchian, see Clement Levallois (2009).

⁵ The citation is from Nicolai Foss (1998, 483). See Edith Penrose (1955; 1959a; 1959b). On the evolutionary character of Penrose' theory, see Stanley Metcalfe (1988) and Ulrich Witt (2005).

⁶ I thank an anonymous referee for pointing to the relevance of Young on this issue.

⁷ Alchian denied that he developed a substantial biological analogy; "every reference to the biological analogy was merely expository, designed to clarify the ideas in the theory." (Alchian 1953, 601). In her rejoinder, Penrose quoted from Alchian's original article, where he first claimed that his approach "embodies the principle of biological evolution and natural selection." (Alchian cited by Edith Penrose 1953, 603).

⁸ However, we find it far-fetched to conclude that "social Darwinism" is a mere "myth". See Bellomy's balanced judgment on this issue.

⁹ Edith Penrose (1952, footnote 13). The pervasiveness of an ideology of "social Darwinism" in the business community that is suggested by the quote from Rockefeller was later put into doubt by Irvin Wyllie (1959). The quotation is actually by John D. Rockefeller Jr., and its frequent citation by "anti-social Darwinists" makes it more of a gimmick than a definitive illustration of the intellectual atmosphere reigning in business communities in the early twentieth century.

¹⁰ Once more, we want to make clear that we do not argue for a direct causal link between philosophical beliefs and analytical conclusions in Penrose' contributions. We merely affirm that those philosophical beliefs presented a "lucky consistency" (Cherrier 2007) with the analytical conclusions that she reached.

¹¹ This section draws extensively from the biography of Edith Penrose established by Perran Penrose and Christoph Pitelis (1999). We also referred to Michael Best and

Elisabeth Garnsey (1999) and a phone interview with David Tilton Denhardt (March 2, 2009).

¹² Penrose' reflections on her experience as an economist and social worker can be found in Edith Penrose (1947).

¹³ Penrose and Pitelis (1999, 4). On Ernest Penrose, see Ronald Dore and Radha Sinha (1987). In this volume, Edith Penrose makes a contribution where she cites a text from her husband about the "population problem," where he shares Edith's skepticism over the inexorability of so-called natural laws such as population growth and emphasized the power of social reform.

¹⁴ Edith and Ernest Penrose married in 1945.

¹⁵ As mentioned in Penrose and Pitelis (1999, 4). It is corroborated in a biographical account by the wife of Ludwig von Mises, a leader of the Austrian School of economics, where she cites a letter dated June 18, 1940 by Ernest Penrose discussing the granting of an American nonquota immigrant visa to the Mises and encouraging them to leave Geneva (Margit von Mises 1976).

¹⁶ On the academics in the Roosevelt administration, see Paul Cook (1982). Indicted by testimony of defected Soviet spy Elisabeth Bentley, Harry Dexter White appeared on August, 13 1948 before the House of Un-American Activities Committee (HUAC). He had a heart attack in the same evening and died three days later. Biographies of John Winant suggest that his suicide, in November 1947, was related to his disillusionment and (self-) exclusion from the new course of public affairs (see Lorenz [2001, 129-130] and Freedman [2000]). Another prominent economist in the Roosevelt administration who

was labeled a spy (and terminated his career in the United States) is Lauchlin Currie.

Currie appeared together with White before the HUAC (Sandilands 2000).

¹⁷ Lattimore had been recruited by Currie and appointed by a committee chaired by Harry Dexter White to serve as an adviser to Chiang Kai-shek in 1941 (Sandilands 1990; Newman 1992).

¹⁸ “Hopkins Expert Discusses War Food Requirements”, *Evening Sun*, October 8, 1947. [Exhibit A in FBI file n. 138-HQ-4400 on Penrose, Ernest Francis. This file, retrieved with Freedom of Information Act request number 1126876- 000, comprises 368 pages 227 of which have been released to me. Thereafter: **Penrose file**.] On the friendship with the Penroses, “A pleasant but rather late evening with the Boas’, the Lattimores, and Dorothy Thomas.”, Edith Penrose to Fritz Machlup, March 20, 1955, Box 57, Folder 23, Fritz Machlup Papers, Hoover Institution (thereafter: **Machlup Papers**).

¹⁹ This letter to the *Baltimore Sun* is discussed in Report BA138-1801, page 5 (December 18, 1958) in the Penrose file. Though reinstated at the time of Ernest Penrose’s writing, Remington became the target of another investigation opened in December 1950 which eventually led to his imprisonment in 1953. He was murdered in prison in 1954. The partial opening of KGB archives in the late 1990s reveals that Remington could have been a Soviet source (see the Vassiliev notebooks made available by the Cold War International History Project at <http://www.wilsoncenter.org>).

²⁰ Machlup, Edith Penrose’s former PhD advisor at Johns Hopkins, also participated in the administration of the fund. Having emigrated from Austria in the 1930s to flee the Nazi regime, he believed that McCarthyism represented a similar threat to American democracy – to the point that despite his strong neoliberal opinions, he intended to vote

for the Democratic candidate at the 1952 presidential election, to the despair of his friend Milton Friedman. See Friedman to Machlup, October 26, 1952; Machlup to Friedman, October 28, 1952; Friedman to Machlup, October 30, 1952, all three letters in Box 38, Folder 23, Machlup Papers.

²¹ The FBI file on the Lattimore Defense Fund, retrieved with a Freedom of Information Act request (number 1128389- 000), comprises 729 pages 728 of which have been released to me. In this file, the only piece of evidence collected against Edith Penrose was the testimony by one of her students, who reported that Edith Penrose had “stated to her class that ‘State taxes are regressive [sic]’ and that ‘People should leave their money to the State instead of to their family.’ [The student] stated that she considered such a philosophy very Russian.” (Office memorandum from Special Agent in Charge, Baltimore to J. Edgar Hoover, Sept 3, 1953, on page 22, Owen Lattimore Defense Fund FBI file). The FBI was able to obtain a partial list of the contributors to the fund through an informant working in the bank where the donators’s checks were deposited. Each of the contributors was then systematically investigated by the local offices of the FBI in their state of residence.

²² The quote is from Degler (1991, viii) cited in Hodgson (2005, 119). On the reshaping of the American identity in relation to contemporary scientific conceptions, see Stanley Coben (1975), Richard Weiss (1979) and Philip Gleason (1981).

²³ The investigation of Ernest Penrose was filed on September 11, 1958 under the category 138 “Loyalty of Employees of the United Nations and Other Public International Organizations”. “This classification concerns FBI investigations based on referrals from the Office of Personnel Management wherein a question or allegation has

been received regarding the applicant's loyalty to the U.S. Government”

(http://foia.fbi.gov/privacy_systems/63fr8659.htm, retrieved on June 19, 2009).

²⁴ File BA 138-1801, p. 3, Penrose file. Interviewed by the FBI about Penrose, Machlup’s ironic response was faithfully reproduced in his report by the special agent: “[Machlup] said the applicant [Ernest Penrose] is quite British in outlook, but his opinion is that this is only natural for a native-born Englishman.” *Ibid.*, p. 9.

²⁵ The FBI discovered that on April 22, 1936, Edith Penrose had been a speaker at an anti-war rally, sharing the platform with a socialist and a communist. In 1939, Ernest Penrose had sponsored a fund drive for the *Daily People’s World*, a communist journal from the West Coast.

²⁶ Transcript of the hearing on “Internal Security – Subversion in the School System” by the Senate Internal Security Subcommittee, April 16, 1953, on p.15.

²⁷ A. Rosen to G.A. Nease, December 3, 1958, Penrose file.

References

- Alchian, Armen A. 1953. Biological analogies in the theory of the firm: Comment. *American Economic Review* 43, no. 4 (September): 600-603.
- Alchian, Armen A. 1950. Uncertainty, evolution and economic theory. *Journal of Political Economy* 58, no. 3 (June): 211-221.
- Aldrich, Howard E., Geoffrey M. Hodgson, David L. Hull, Thorbjørn Knudsen, Joel Mokyr, and Viktor J. Vanberg. 2008. In defence of generalized Darwinism. *Journal of Evolutionary Economics* 18, no. 5 (October): 577-596.
- Bannister, Robert C. 1979. *Social Darwinism: Science and Myth in Anglo-American*

- Social Thought*. Philadelphia: Temple University Press.
- Bellomy, Donald C. 1984. Social Darwinism' revisited. *Perspectives in American History* 1: 1-129.
- Best, Michael H, and Elisabeth Garnsey. 1999. Edith Penrose, 1914-1996. *Economic Journal* 109, no. 453 (February): F187-F201.
- Black, Max. 1962. *Models and Metaphors*. Ithaca, NY: Cornell University Press.
- Boulding, Kenneth E. 1950. *A Reconstruction of Economics*: New York: Wiley & Sons.
- Chafe, William H. 1995. *The Unfinished Journey: America Since World War II*. 3rd ed. Oxford: Oxford University Press.
- Cherrier, Beatrice. 2007. The Lucky Consistency of Milton Friedman's Science and Politics, 1933-1962 presented at the Conference "Rethinking the Chicago School of Economics", September 14, University of Notre Dame.
- . 2008. Valeurs et Theorisation Economique chez Gunnar Myrdal, Jacob Marschak, et Milton Friedman. Nanterre: Universite Paris X.
- Clark, Gregory. 2007. *A Farewell to Alms: A Brief Economic History of the World*. illustrated edition. Princeton University Press.
- Coben, Stanley. 1975. The assault on Victorianism in the twentieth century. *American Quarterly* 27, no. 5 (December): 604-625.
- Cohen, I. Bernard. 1993. Analogy, Homology, and Metaphor in the Interactions Between the Natural Sciences and the Social Sciences, Especially Economics. In , ed. Neil de Marchi. Durham-London: Duke University Press.
- Colander, David C., and Harry H. Landreth. 1997. *The Coming of Keynesianism to America: Conversation With the Founders of Keynesian Economics*. London: Edward Elgar.
- Cook, Paul B. 1982. *Academics in Government from Roosevelt to Roosevelt*. New York: Garland Pub.
- Degler, Carl N. 1991. *In Search of Human Nature: The Decline and Revival of Darwinism in American Social Thought*. New York: Oxford University Press.
- Dore, Ronald, and Radha Sinha, eds. 1987. *Japan and World Depression, Then and Now : Essays in Memory of E.F. Penrose*. Basingstoke: Macmillan.
- Dupre, John. 1994. Against scientific imperialism. *PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association* 1994: 374-381.
- Evans, George Heberton. 1977. *Recollections of the Johns Hopkins University, 1916-1970*. Baltimore: Evans.
- Fontaine, Philippe. 2010. Stabilizing American Society: Kenneth Boulding and the Integration of the Social Sciences, 1943-1980. *Science in Context* 23, no. 2: forthcoming.
- Foss, Nicolai J. 1998. The competence-based approach: Veblenian ideas in the modern theory of the firm. *Cambridge Journal of Economics* 22, no. 4 (July): 479-95.
- Freedman, James O. 2000. John Gilbert Winant. Brief life of an exemplary public servant: 1889-1947. *Harvard Magazine* 103, no. 2 (December). <http://harvardmagazine.com/2000/11/john-gilbert-winant.html>.
- Galbraith, John K. 1982. *A Life in Our Times*. New York: Ballantine Books.
- Gleason, Philip. 1981. Americans all: World War II and the shaping of American Identity. *Review of Politics* 43, no. 4 (October): 483-518.
- Haynes, John Earl, and Harvey Klehr. 1999. *Venona: Decoding Soviet Espionage in*

- America*. Yale University Press.
- Hodgson, Geoffrey M. 1993. *Economics and Evolution: Bringing Life Back into Economics*. Ann Arbor: University of Michigan Press.
- . 2002. Darwinism in economics: From analogy to ontology. *Journal of Evolutionary Economics* 12, no. 3 (July): 259-281.
- . 2004. Darwinism, causality and the social sciences. *Journal of Economic Methodology* 11, no. 2 (June): 175-194.
- . 2004. Social Darwinism in Anglophone academic journals: A contribution to the history of the term. *Journal of Historical Sociology* 17, no. 4 (December): 428-463.
- . 2005. Decomposition and Growth: Biological Metaphors in Economics from the 1880s to the 1980s. In *The Evolutionary Foundations of Economics*, ed. Kurt Dopfer. Cambridge: Cambridge University Press.
- Hodgson, Geoffrey M., and Thorbjørn Knudsen. 2006. Dismantling Lamarckism: why descriptions of socio-economic evolution as Lamarckian are misleading. *Journal of Evolutionary Economics* 16, no. 4 (October): 343-366.
- . 2007. Evolutionary theorizing beyond Lamarckism: a reply to Richard Nelson. *Journal of Evolutionary Economics* 22, no. 1 (January): 353-9.
- Hofstadter, Richard. [1944] 1992. *Social Darwinism in American Thought*. Boston: Beacon Press.
- Jackson, John P. 2010. Definitional argument in evolutionary psychology and cultural anthropology. *Science in Context* 23, no. 01: 121-150.
doi:10.1017/S0269889709990263.
- Khalil, Elias L. 1998. The five careers of the biological metaphor in economic theory. *Journal of Socio-Economics* 2: 29-52.
- Khalil, Elias L. 2000. Types of metaphors and identificational slips in economic discourse. *Research in the History of Economic Thought and Methodology* 0: 83-105.
- Klamer, Arjo, and Thomas C Leonard. 1994. So What's an Economic Metaphor? In *Natural Images in Economic Thought*, ed. Philip Mirowski. Cambridge: Cambridge University Press.
- Kor, Yasemin Y, and Joseph T Mahoney. 2004. Edith Penrose's (1959) contributions to the resource-based view of strategic management. *Journal of Management Studies* 41, no. 1 (January): 183-191.
- Krajbich, Ian, Colin Camerer, John Ledyard, and Antonio Rangel. 2009. Using neural measures of economic value to solve the public goods free-rider problem. *Science* 326, no. 5952 (September 10): 596-599.
- Lagueux, Maurice. 1993. Natural selection and economics. *Methodus* 5, no. 1 (June): 93-100.
- . 1998. Rationalité et sélection naturelle en économie. *Philosophiques* 25, no. 2 (Fall): 163-180.
- Latour, Bruno, and Steve Woolgar. 1986. *Laboratory Life: The Construction of Scientific Facts*. 2nd ed. Beverly Hills: Sage.
- Leonard, Thomas C. 2009. Origins of the myth of social Darwinism: The ambiguous legacy of Richard Hofstadter's Social Darwinism in American Thought. *Journal of Economic Behavior & Organization* 71, no. 1: 37-51.

- doi:10.1016/j.jebo.2007.11.004.
- Levallois, Clement. 2009. One analogy can hide another: Physics and biology in Alchian's "economic natural selection". *History of Political Economy* 41, no. 1 (Spring): 163-181.
- Lewis, Lionel S. 1993. *The Cold War and Academic Governance: The Lattimore Case at John Hopkins*. New York: State University of New York.
- Lockett, Andy, and Steve Thompson. 2004. Edith Penrose's contributions to the resource-based view: An alternative perspective. *Journal of Management Studies* 41, no. 1 (January): 193-203.
- Lorenz, Edward C. 2001. *Defining Global Justice: The History of U.S. International Labor Standards Policy*. University of Notre Dame Press.
- Machlup, Fritz, and Edith T. Penrose. 1950. The patent controversy in the nineteenth century. *Journal of Economic History* 10, no. 1 (May): 1-29.
- Marshall, Alfred. 1920. *Principles of Economics: An Introductory Volume*. 8th ed. London: Macmillan.
- McCloskey, Deirdre N. 1983. The rhetoric of economics. *Journal of Economic Literature* 21, no. 2 (June): 481-517.
- Metcalf, J. Stanley. 1988. Evolution and Economic Change. In *Technology and Economic Progress*, ed. Aubrey Silberston, 54-85. Basingstoke: Macmillan.
- Miscamble, Wilson D. 2007. *From Roosevelt to Truman: Potsdam, Hiroshima, and the Cold War*. Cambridge: Cambridge University Press.
- Mises, Margit Von. 1976. *My Years With Ludwig von Mises*. New York: Arlington House.
- Morgan, Mary S, and Malcolm Rutherford, eds. 1998. *From Interwar Pluralism to Postwar Neoclassicism*. History of Political Economy Annual Supplement to volume 30. Durham-London: Duke University Press.
- Morgan, Mary S. 1995. Evolutionary Metaphors in Explanations of American Industrial Competition. In *Biology as Society, Society as Biology: Metaphors*, ed. Sabine Maasen, Everett Mendelsohn, and Peter Weingart. Boston: Kluwer Academic Publishers.
- Navasky, Victor S. 1980. *Naming names*. New York: Viking Press.
- Nelson, Richard R. 2007. Comment on: Dismantling Lamarckism: why descriptions of socio-economic evolution as Lamarckian are misleading, by Hodgson and Knudsen. *Journal of Evolutionary Economics* 17, no. 3 (June): 349-52.
- Newman, Robert P. 1992. *Owen Lattimore and the 'Loss' of China*. Berkeley: University of California Press.
- Parkin, Michael, and David N. King. 1992. *Economics*. Pearson Higher Education.
- Penrose, Edith T. 1947. Economist and social worker. *Survey Midmonthly* 83, no. 8 (August): 222-223.
- . 1951. *The Economics of the International Patent System*. Baltimore: Johns Hopkins Press.
- . 1952. Biological analogies in the theory of the firm. *American Economic Review* 42, no. 5 (December): 804-819.
- . 1953. Biological analogies in the theory of the firm: Rejoinder. *American Economic Review* 43, no. 4 (September): 603-609.
- . 1955. Limits to the growth and size of firms. *American Economic Review* 45, no.

- 2 (May): 531-543.
- . 1959a. *The Theory of the Growth of the Firm*. Oxford: Oxford University Press.
- . 1959b. The growth of the firm. A case study: The Hercules Powder Company. *Business History Review* 34, no. 1 (Spring): 1-23.
- . 1995 [1959]. *The Theory of the Growth of the Firm*. 3rd ed with a new foreword by the author. Oxford: Oxford University Press.
- Penrose, Perran, and Christos Pitelis. 1999. Edith Elura Tilton Penrose: Life, contribution and influence. *Contributions to Political Economy* 18, no. 1 (December): 3-22.
- Pine, Alex, Ben Seymour, Jonathan P. Roiser, Peter Bossaerts, Karl J. Friston, H. Valerie Curran, and Raymond J. Dolan. 2009. Encoding of marginal utility across time in the human brain. *Journal of Neuroscience* 29, no. 30 (July 29): 9575-9581.
- Rugman, Alan M., and Alain Verbeke. 2002. Edith Penrose's contribution to the resource-based view of strategic management. *Strategic Management Studies* 23, no. 8: 769-780.
- . 2004. A final word on Edith Penrose. *Journal of Management Studies* 41, no. 0 (January): 205-317.
- Samuels, Warren J. 1977. Ideology in Economics. In *Modern Economic Thought*, ed. E. Roy Weintraub. Oxford: Blackwell.
- Sandilands, Roger J. 1990. *The Life and Political Economy of Lauchlin Currie: New Dealer, Presidential Advisor, and Development Economist*. Duke University Press.
- . 2000. Guilt by association? Lauchlin Currie's alleged involvement with Washington economists in Soviet espionage. *History of Political Economy* 32, no. 3 (September 1): 473-515.
- Suplizio, Jean. 2006. Evolutionary psychology: The academic debate. *Science in Context* 19, no. 2: 269-93.
- Tilton Denhardt, Edith T. 1941. The Effect of War on the Relative Importance of Producing Centres, with Special Reference to the Textile Industry. In *Studies in War Economics*. Vol. 33. B. Montreal: ILO.
- . 1943. *Food Control in Great Britain*. Vol. 35. B. Montreal: ILO.
- Vromen, Jack J. 1995. *Economic Evolution: An Enquiry into the Foundations of New Institutional Economics*. London: Routledge.
- Weiss, Richard. 1979. Ethnicity and reform: Minorities and the ambience of the Depression years. *Journal of American History* 66, no. 3 (December): 566-585.
- Witt, Ulrich. 2005. The Evolutionary Perspective on Organizational Change and the Theory of the Firm. In *The Evolutionary Foundations of Economics*, ed. Kurt Dopfer, 339-364. Cambridge: Cambridge University Press.
- Wyllie, Irvin G. 1959. Social Darwinism and the businessman. *Proceedings of the American Philosophical Society* 103, no. 5 (October 15): 629-635.
- Young, Allyn A. 1928. Increasing returns and economic progress. *Economic Journal* 38, no. 152 (December): 527-542.
- . 1999 [1929]. Big Business: How the Economic System Grows and Evolves Like a Living Organism. In *Money and Growth: Selected Papers of Allyn Abbott Young*, ed. Perry Mehrling and Roger J. Sandilands, 411-420. London: Routledge.