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The History of Pollution 'Externalities' in Economic Thought

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Abstract

Today, environmental economics is the response of the neoclassical economic school to the ecological crisis, but at one time its leading contributors regarded it as a revolutionary development that would change the conduct and content of economics as a discipline. Understanding and addressing environmental pollution was core to that potential paradigm shift. In tracing the history of conceptualising pollution as an externality and market failure this paper covers the development of ideas by Marshall, Pigou, Pareto, Coase, Stigler, Samuelson, Ciciacy-Wantrup and Kapp. Pollution externality theory is shown to have incorporated an elitist ethics and liberal market ideology. As a market failure pollution was deemed a minor correctible error of the price system. Monetary valuation of social and environmental harm became the means of justifying optimal levels of pollution. Neoliberal theories of spreading property rights further watered down potential interventionist aspects. Bio-physical realism, in the work of Kneese, Ayres and d'Arge, and social realism in Kapp's theory of cost shifting were lost once environmental economics adopted a deductivist mathematical formalism. Kapp's alternative theory is based on a classic institutionalists economic understanding of cost shifting and power relations. It advocates a public policy response in the form of objective social minima achieved via regulation and planning. This theory has until now been successfully supressed to prevent a potential revolutionary paradigm shift in economic

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I. INTRODUCTION

Environmental economics appeared in the 1960s, along with the growth in public environmental awareness, as a direct response to the rise of ecological and human health problems related to pollution (Spash 1999). By the late 1960s and early 1970s, the promise of material wealth for all through economic growth and post World War II optimism in the abilities of science and technology were faltering. Pollution from agro-chemicals, DDT and radiation from nuclear bomb testing were amongst the problems highlighted.[1] Economic growth was strongly debated and increasingly criticised as positively misleading in terms of the consequences for human society (e.g., Mishan 1967, 1969a; Meadows et al. 1972; Daly 1974; Hirsch 1977; Scitovsky 1976; Schumacher 1973). In order to understand the predicament of human kind, the challenge appeared to be to create a totally new approach to economics.

The contributions of economists, during the rise of modern environmentalism, developed around a distinct set of connected research agendas with pollution at the centre. First, there was the relationship of environmental problems to the growth economy, with its massive inputs of materials and energy, justified as necessary to meet the ever expanding wants of the consumer. Second, there was the, apparently perplexing, question of how an economic system that was meant to create wealth, and well-being for all, was instead creating social and ecological harm as a normal part of business practice? Third, there was the need to measure those harms (as social costs),[2] leading to a sub-agenda of research into methods for the monetary valuation of environmental impacts to inform public policy. Fourth, there was

[1] Hundreds of nuclear weapons tests took place leading to rising public health concerns and a Partial Test Ban Treaty being signed in 1963.

[2] There were also recognised benefits (e.g. aesthetics, recreation) that economists associated with environmental change, and these were similarly to be measured and monetised.

the design, evaluation and recommendation of what constituted the best policy response (e.g. State regulation, planning, taxes/subsidies). All these research agendas posed major potential challenges to the hegemonic economic theory that promoted resource efficient allocation as achievable via a self-regulating price mechanism based on voluntary decentralized exchange.[3] Domination of the profession by two distinct paradigms, namely economic growth and price-making markets, was (implicitly) being opposed by a new transformative social-ecological economic paradigm (see Spash 2020).

Evidence of extensive social costs from pollution undermined the price theory of neoclassical economics. Environmental economics then appeared both innovative, progressive and potentially revolutionary. The reality was to be a little different because the revolutionary endeavour faded into nothing more than mildly reformist or totally conformist policy advocacy. Environmental economists soon conceptualised and delimited pollution to fit within a market-based capital accumulating economy rather than pursue economic transformation to address emerging social-ecological crises. Even advocacy of pollution taxes diminished as new markets in pollution permits became the favoured 'solution'. From the 1980s onwards, the economics profession increased their faith in the ideal of self-regulating markets. The neoliberals of the Mont Pèlerin Society (e.g. Gary Becker, James Buchanan, Ronald Coase, Milton Friedman, Frederick Hayek, Frank Knight, George Stigler, Ludwig von Mises) pushed the neoclassicals from reformist State intervention to advocating a State in service of the corporation (Mirowski and Plehwe 2009; Mirowski 2013).

[3] This paper is part of an ongoing project, addressing the struggle for revolutionary change in economics, that will be published as a book including coverage of the research agendas of economists during the rise of modern environmentalism. Here a critical analysis in presented of treating pollution as a correctible market failure understood as a negative externality.

The rise of environmentalism can then be understood as reawakening a contestation in economics over the best system for allocating resources to achieve the social good of all, and specifically the role of a planned social economy versus price-making markets. The issue was core to the socialist calculation debate of the 1920s and 1930s (Adaman and Devine 1996). Neoliberal Austrian economists, von Mises and Hayek, argued against a range of socialists from Otto Neurath, favouring a non-market economy in-kind, to Oskar Lange and Fred Taylor, supporting a market socialist model.[4] Historically, Lange's neoclassical modelling contributions were regarded as key to winning the debate in favour of the socialists by showing that government could achieve rational resource allocation using prices established through trial and error (Lange 1936, 1937; Lange and Taylor 1938).

Kapp provides a direct link from the socialist calculation debate of the 1930s into the environmental economics debate of the 1970s. His 1936 (German language) thesis criticises the positon of his supervisor von Mises by highlighting the importance of social costs (Berger 2016, p. 22-34; 2017, p. 16-18). He proceeded to develop an institutional theory that explains social and environmental problems as resulting from business enterprises' deliberate 'cost shifting' practices (Kapp 1950, 1963). In brief, neoclassically trained environmental economists' misconceptualise pollution as unintended isolated 'externalities'. Social costs cannot meaningfully be assessed in monetary terms to be internalised. Reforming price-making markets via pollution taxes fails to address power relationships and the problematic structure of competitive markets. Kapp's realist social-ecological economic theory stands in paradigmatic opposition to the deductivist abstractions of neoclassical economists.

This paper explores how alternative, realist explanations were pushed aside and pollution became characterised as a correctible market failure, external to actors decisions.

[4] There were in fact several debates, see O'Neill (1996).

Next, Section II traces the history of thought on 'externalities' from Marshal to Pigou, including the adoption of Pareto efficiency under 'new welfare economics'. Pigou's work is shown to have been misrepresented, as supporting an idealised optimal tax to correct minor market failure, ignoring his positions on legal and contractual institutions, criticism of markets and need for socialist reform of capitalism. Central amongst those caricaturing Pigou was Coase, whose own ideas were co-opted by his neoliberal colleagues of the Chicago School, as explained in Section III. A tripartite battle then developed with an emergent environmental economics fluctuating between neoclassical conformity and social-ecological realism while facing the rise of neoliberal ideology championed by an elite of economics professors. Section IV documents pollution becoming formalised in environmental economics as an unproblematic abstract externality with Pareto optimal solutions. Section V contrast this outcome with both early realist discussions in environmental economics and Kapp's theory of social cost shifting. I conclude with some reflections on the resulting failure of mainstream economists to address ecological crises (e.g. climate catastrophe) and the continuing and urgent need for a paradigm shift.

II. PIGOUVIAN TAXES AND PARETO EFFICIENCY

The line of reasoning adopted by environmental economists, about pollution being a market failure, is derived from a theory of industrial "external economies" originating with Marshall (1916 [1890]), and further developed by the conceptualisation of social costs in the work of Pigou (1920). Marshall was concerned about social benefits from infrastructure and how one firm's location can benefit from another's (e.g. one builds a road and a second comes along and uses it without having paid anything). Pigou (1920, p. 159-163) expanded on this idea to cover a range of factors outside the planning process.

However, in the four editions of his widely cited book *The Economics of Welfare*, Pigou never uses the term 'externalities'. Instead, he talks of "divergences between marginal social

net product and marginal trade net product", as well as "uncompensated services" and "incidental uncharged disservices" (*Ibid*). Pigou gives several examples of disservices, including: building developments that remove play areas, injure the "health and efficiency of families living there", crowd out existing properties and reduce air quality; running of motor cars that wear out the surface of roads; production and sale of intoxicants causing extra costs in terms of policemen and prisons; wars waged to obtain foreign trade and investment returns; and women doing factory work while pregnant impacting on the health of the child (*Ibid*, p. 162-163). He explains that some such problems, falling outside contract law, could be addressed by government interventions using economic incentives.

> "It is plain that divergences between private and social net product of the kinds we have so far been considering cannot, like divergences due to tenancy laws, be mitigated by a modification of the contractual relation between any two contracting parties, because the divergence arises out of a service or disservice rendered to persons other than the contracting parties. It is, however, possible for the State, if it so chooses, to remove the divergence in any field by "extraordinary encouragements" or "extraordinary restraints" upon investments in that field. The most obvious forms which these encouragements and restraints may assume are, of course, those of bounties [i.e., subsidies] and taxes." (*Ibid,* p. 168)

The term "extraordinary encouragements" is borrowed from Adam Smith's *Wealth of Nations* (e.g., Smith 1976 [1776], p. 14, 182, 275, 493, 742, 838, 914). Smith also uses variations such as extraordinary privileges, restrictions and restraints (*Ibid*, p. 864, 881, 914) and extraordinary taxes (*Ibid*, p. 1142). These are general references by Smith to various forms of government intervention to encourage/discourage types of trade and industrial production. Pigou (1920) then proceeds to also give general examples of financial incentives in actual policy (e.g. taxing alcohol, housing developers paying for free playgrounds, petrol taxes and

motor car licenses, national insurance taxes, taxing income from foreign investments).[5] However, none of these cases involve economists calculating the (marginal) social costs to set the "bounties and taxes".

In a later work, Pigou (1949 [1937]) explicitly argues against the possibility of quantifying social costs. He states that, "the practical difficulties of determining the right rates of bounty and duty would be extraordinarily great" (*Ibid*, p. 42). He questions the economists' ability to ascertain social cost in terms of money. He specifically asks: "how are we to make the corresponding calculation for a factory industry the smoke of which increase the expenses of the public in washing and cleaning?" (*Ibid*, p. 43). Similarly, he questions the ability to calculate benefits from planting forests that improve climatic conditions. He makes clear that the examples of subsidies/taxes, that he gave in *The Economics of Welfare*, were not premised on such calculations being actualised when he states that:

> "so far as I know, no attempt has ever been made in a capitalist régime to use bounties and duties for bringing about adjustments of the kind I have been describing. Up to the present suggestions in this matter have been confined to the writings of economists; and even they have never attempted the quantitative study that would be necessary before their suggestions could be applied to practice." (*Ibid*)

That social costs cannot be addressed as in "the writings of economists", by a system of "bounties and duties" (i.e., internalised by subsidies and taxes) based on quantitative studies, runs counter to the claims made for 'Pigouvian taxes' by others, after Pigou's demise. Concerning this impossibility of social cost calculation, Pigou himself speculates that

[5] Other types of cases are also considered such as urban planning and zoning laws, slum clearance, worker retraining, maternity leave and liability for healthcare.

"Maybe, it demonstrates in this field the bankruptcy of capitalism".[6] So, somewhat amazingly, given his promotion by neoclassical economists as founder of the method for optimally internalising externalities via tax/subsidy,[7] Pigou here argues against the possibility of the very tax which later bears his name.

Pigou's work also explicitly recognises the limits to markets and the need for central planning and regulation. As he states, before praising the introduction of the 1909 Housing and Town Planning Act:

> "It is as idle to expect a well planned town to result from the independent activities of isolated speculators as it would be to expect a satisfactory picture to result if each separate square inch were painted by an independent artist. No 'invisible hand' can be relied on to produce a good arrangement of the whole from a combination of separate treatments of the parts. It is, therefore, necessary that an authority of wider reach should intervene and should tackle the collective problems of beauty, of air, and of light, as those other collective problems of gas and water have been already tackled." (Pigou 1920, p. 170-171)

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[6] In attempting this social cost calculation he believes a central planning authority would fair no better than the government of a capitalist State. However, he concluded his book in favour of a socialist State agenda including removing inequalities via income taxation, investment in health and education, nationalisation of industries and the central bank, and national planning of most capital investment. At the same time Pigou should not be read as some naïve advocate of government intervention, as ignorantly attempted by Coase (see Aslanbeigui and Oakes 2015, p. 166-169; Aguilera Klink 1994). Part II Chapter XVII "State Intervention" of his *Economics of Welfare* makes clear his awareness of the institutional context determining good outcomes from interventions by public authorities (Pigou 1920).

[7] For example the Pigou Club established by Gregory Mankiw in 2006 has advocated 'Pigouvian taxes', e.g., to address human induced climate change and road congestion (Lovejoy Knight 2018, p. 65). Members have included: Gary Becker, Paul Krugman and Lawrence Summers (Aslanbeigui and Oakes 2015, p. 97).

Pigou has been selectively read, and the embedding of market institutions in a planning and legal system (including the role of contractual ties), that he recognised as essential, has conveniently been forgotten in the move to economic systems dominated by price-making markets where direct government intervention and regulation is derided as authoritarian control. As Aguilera Klink (1994, p. 387) has made clear: "Contrary to the simplistic and biased interpretation which has been promoted, Pigou does not see state intervention as being synonymous with imposing taxes."

More generally, as noted by Kapp (1978 [1963], p. 40), the later dismissal by economists of problems in social cost calculation, and the narrowing down of the concept itself, resulted from the rise of 'new welfare economics' (e.g., Little 1950). Its methodological individualism denies the existence of social phenomena and society itself as distinct or having emergent properties. It claims to remove the need for social evaluation and defines social welfare as the sum of individual utilities. The underlying ethical basis is preference utilitarianism. Welfare comparisons across individuals (i.e. how much a change harms or benefits different individuals) are meant to be avoided by adopting the criteria of only making policies that make people better-off and none worse-off.

This approach is attributed to the Italian statistician, economist and sociologist Vilfredo Pareto (1948-1923), and has become integral to neoclassical economists' definition of efficiency (i.e. prescribing whether a resource reallocation would be desirable on grounds of maximising welfare or utility). Most mainstream economists seem to regard this 'Pareto Criterion' as an uncontroversial concept divorced from ethics because efficiency itself is assumed an 'objective' criterion (a paradigmatic dichotomy being enforced between

positive/fact and normative/value).[8] Some suspicion as to the Pareto Criterion's ethical bias might have been raised by the fact that its originator supported elitist social theories (Buzaglo 2018), and welcomed Mussolini's fascism (Losito and Segre 1992). Given the importance economists have attributed to Pareto's ideas an extensive footnote is include here on his political ideology, which is regarded as especially important because it goes largely unremarked.[9]

Consistent with Pareto's political ideology, the theory neoclassical economists have adopted as their defining (Pareto) efficiency criterion allows policies to be designated as 'optimal' that would make an elite better-off while doing nothing for anyone else. That is, the

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[8] Some debates occurred around alternatives such as a minmax criterion stimulated by Rawls *Theory of Justice* (e.g., Sen 1976), and intergenerational ethics/equity (see Spash 1993). However, economic orthodoxy relegated ethics to distributional issues as if divorced from efficiency on the basis of a naïve objectivism (see Bromley 2009 [1990]).

[9] Pareto regarded parliaments as the instruments of private capitalist interests, allowing the populace to be dominated and manipulated by the plutocratic ruling class. He wrote supporting fascist violence as a legitimate response to weak governments, political anarchy and economic recession. "Fascism's ascension to power was thus greeted by Pareto as the salvation of Italy" (Losito and Segre 1992, p. 72). In 1922 Pareto was honoured by Mussolini with a seat in the Fascist senate, which he accepted after declining the same appointment from Italy's post-war government (Buzaglo 2018, p. 98). His works enjoyed immense popularity in the 1920s and 1930s despite his pseudo-scientific approach. The publication of the English translation of Pareto's *Mind and Society* in 1935 was closely followed by Franz Borkcnau's exposure of its logical inconsistencies, contradictions and sophistry. A review of Borkcnau's book in *The Spectator* states that "Pareto may be described and best understood as a precursor of Fascism" (Read 1936). As explained by Losito and Segre (1992), his ideas were selectively employed to endorse and legitimate Mussolini's dictatorship and his reception by Italian Fascists varied from uncritical acceptance to total rejection. However, regardless of the specific political reception by Italian Fascists of Mussolini's party, there are clear core aspects of his ideas and writing supporting and informing Fascism in general. Vander Zanden (1960) has systematically appraised, explained and presented these as his anti-intellectualism and anti-rationalism, quasi-biological theory of the elite, militant vilification and hatred of democracy and glorification of force as an instrument for acquiring and maintaining power.

ruling elite is empowered to make policy changes if these can be justified as improving their own well-being while leaving others in the same situation as before. In fact, the Pareto Criterion is typically unworkable because somebody is nearly always made worse-off. Hence Kaldor and Hicks tried to salvage the situation by putting forward an alternative prescriptive criterion where only the ability to *potentially* (but not actually) compensate for harm was now promoted as a good test for making efficient policy. Mishan (1969b, p. 225) notes that Kaldor and Hicks erroneously claimed "an objective method of detecting increases in 'wealth' or 'efficiency' had been discovered", and its implications were also ethically unacceptable. In addition, this merely reintroduced the problem of assessing welfare differences; that is, the amount of monetary transfers necessary to leave those harmed (e.g. by factory pollution) potentially no worse-off would have to be determined and compared with the gains of those made better-off (e.g. by consuming polluting factory products). Other alternatives put forward were to make explicit judgements over income distribution via social welfare functions or weightings (Hanley and Spash 1993, p. 48-50). However, such problems are learnt by mainstream economists, during their training, and duly forgotten. Thus the goal of (potential) Pareto efficiency has remained.

New welfare economics then combined with externality theory to justify at best mild reformism, and more typically 'business as usual', in response to ecological destruction, because the projects causing this destruction could be deemed to create greater benefits (to the elite) than harms (to the poor). This may also be described more crudely as jobs (code for capitalist profits) are more valuable than the environment (i.e. health of poor people and non-humans). Pollution impacts could, the argument goes, *potentially* be paid for and harm compensated, making nobody worse-off and somebody better-off. More than this, contra Pigou, the harm could be converted into money and included in a calculation of marginal social costs relating to a production process so that the price mechanisms could be adjusted to

achieve allocative (Pareto) efficiency, i.e., externalities could be optimally internalised. However, this theory of pollution externalities took some decades to appear.

III. RISING NEOLIBERALISM: PERVERTING PIGOU & CO-OPTING COASE

The discussion of 'external diseconomies' developed little from Marshall until the 1960s and paid only passing attention to pollution with the two substantive exceptions of Pigou (1920) and Kapp (1950).[10] Pigou (1920) has some passages that are amazingly prescient of the environmental movement, covering a range of concerns, including: urban and industrial air pollution (pp. 160-161), natural resource depletion and species extinction (p. 28), frivolous fossil fuel use for convenience at the expense of future generations (p.28), soil nutrient loss (p. 38), and much on waste of resources by businesses (including advertising). However the environmental entries are relatively brief and purely illustrative, at best covering a few paragraphs each. The first major economic work on the environment is the book by Kapp (1950), which is distinctive both in approach and extent of coverage, including two chapters entirely dedicated to pollution (i.e. air and water) and presenting empirical evidence on social costs (I return to Kapp in Section V).

Despite Kapp's 1950 book being widely reviewed, including by Knight of the Chicago School (Berger 2017, p. 24), and translated into six different languages (Kapp 1978 [1963], p. vii-viii), economists failed to take seriously the empirical phenomena that is pollution. A strange turn of events was then how Coase (1960), in an attack on Pigou, stimulated his

[10] Debates occurred concerning producer-producer economies, economies of scale (decreasing as diseconomies and increasing as economies), pecuniary and technological economies, and internal and external economies. Thus, Ellis and Fellner (1943, p. 502, 510) specifically distinguish their discussion from Pigou's "genuine diseconomies" concerning social vs. private costs and pollution. Knight (1924), in contradistinction to Pigou, discussed road congestion as a resource waste to be addressed by private property rights and maximising rent (see Mishan 1965, p. 17-18).

neoliberal colleagues to write about such externalities in their defence of price-making markets against government intervention (e.g. Buchanan and Stubblebine 1962; Demsetz 1964). Even Kapp's book then got a passing critical citation from Buchanan (1962, p. 19).[11] Stigler (1966, p. 110-114) summarised the neoliberals favoured property rights solution as the 'Coase Theorem'. This sudden attention contrasts strongly with how Stigler, like others, previously side-lined pollution problems.

In the 1949 edition of his major work on price theory, Stigler devotes two short paragraphs to the pollution related discrepancy between private and social cost, giving the example of "the damage done by the smoke which pours from his [the producers] factory's chimneys", while referring the reader to the "impressive list of such disharmonies" given by Pigou. He then summarises the policy response to such 'disharmonies' as follows:

> "No single principle underlies them, and they are eliminated largely by *ad hoc* policies. Such policies include not only private activity (for example, cooperation) but also state interference by the use of the police power (zoning), taxes (automobiles, liquor), subsidies (conservation), dissemination of information (foods, drugs, securities), and numerous other devices." (Stigler 1949, p. 107)

This broad range of possible institutional arrangements seems to summarise Pigou's account, but not the *ad hoc* dismissal nor lack of underlying principle. While Stigler states these things are "valid, and indeed, important", at this point in time they do not seem important enough for him to spend much time addressing, nor does he draw any serious implications for price theory.

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[11] Buchanan opposed the assumption of neoclassical welfare economists that the State was a benevolent actor whose intervention would efficiently correct market failures (Mirowski and Plehwe 2009, p. 324).

This situation continued more generally in the 1950s. Despite placing both external economies and diseconomies in the title of his work, Meade (1952) focusses almost exclusively on the former, which he relates to unpaid factors of production in commercial industries, exemplified primarily by a beekeeper's domesticated bees pollinating a commercial apple orchard. Scitovsky (1954) notes the potential for activities of a producer impacting on people's "personal satisfaction" and occurring "in ways that do not operate through the market mechanism". More specifically he states that: "These may be called the producer's 'direct' (i.e., nonmarket) influence on personal satisfaction and are best known by the example of the factory that inconveniences the neighborhood [sic] with the fumes or noise that emanate from it" (Scitovsky 1954, p. 144). However, like Meade, his primary concern is with Marshallian industrial external economies affecting business profitability and productivity. The external diseconomy, as found in the case of industrial pollution, he thinks is "exceptional, because most instances of it can be and usually are eliminated by zoning ordinances and industrial regulation concerned with public health and safety" (*Ibid*).

A distinct shift occurs with Coase (1960) who focuses a very long article entirely on "those actions of business firms which have harmful effects on others" (*Ibid*, p. 1) and specifically addresses pollution. His favourite example (mentioned 62 times) is smoke emanating from a chimney or factory. He makes no mention of diseconomies, nor any connections to that (minimal) literature, but rather employs the terms damage, harm, harmful effect and nuisance. He claims economists have "largely followed" Pigou concerning polluter liability leading to conclusions with which "most economists" agree, and by the second paragraph this has become the "traditional approach" (*Ibid*, p. 1-2). The only support given for this claimed consensus in approach is a single reference citing the case of stream pollution in the textbook by Stigler (1952, p. 105), which on examination proves to have cut down the text over the 1949 edition (cited above) and covers stream pollution with five words in

parenthesis! Undaunted by the lack of evidence, Coase entitles Section IX of his paper "The Pigovian Tradition". This Coase (1960, p. 39) explicitly admits is based purely on his personal anecdotal conjectures relating to an oral tradition amongst those with whom he has spoken!?

Coase narrows the scope of his critique to focus on problems relating to (idealised optimal) pollution taxes, as if this had been Pigou's primary, or indeed only, concern. He problematises the attribution of liability to polluters by raising the reciprocal character of harm (i.e. without a victim there would be no harm) and suggests that under alternative institutional arrangements liability can change. The entire focus of his paper, excepting his totally contradictory ending (see Aguilera Klink 1994, p. 390), is that policy on harm requires weighing-up the financial costs and benefits of the alternatives, using the value of production as measured by the market. As Coase (1960, p. 42) remarks with respect to smoke zoning laws (which might remove polluting factories from residential areas): "The aim of such regulation should not be to eliminate smoke pollution but rather to secure the optimum amount of smoke pollution, this being the amount which will maximise the value of production". He therefore embeds the problem within the price-making market, market values and willingness-to-pay which depends on ability to pay.

The 'Coase Theorem', later formulated by Stigler (1966, p. 110-114), claims well defined property rights 'solve' pollution problems optimally. The attribution to Coase is as misleading as the Pigouvain tax attributed to Pigou by Coase. Indeed, Coase (1991) himself referred to it as the 'infamous Coase Theorem'. This neo-Coasian Stigler Theorem basically relates to a scenario, used by Coase to open his article, where harm can be optimally addressed by a freely negotiated contract given very specific idealised conditions in a highly simplified world with only two actors. Coase used this simplistic 'blackboard economics' or 'toy model' in part to expose the limitations and theoretical unreality of neoclassical

economists' deductivism, which stood in contrast with the second half of his paper using empirical legal case studies (Frischmann and Marciano 2014). What the abstract simple model achieves is to set down the core conceptual parameters within which further discussion is to be held. More specifically, pollution policy is then framed in terms of monetary costs and benefits, in a world where agents possess equal power and knowledge, and consequences are knowable and known. When relaxing the assumptions and increasing the number of actors (i.e. attempting some realism), the result is formulated as creating high 'transactions costs' preventing the supposed 'solution', and results in having to admit that "the government has powers which might enable it to get some things done at a lower cost than could a private organisation" (Coase 1960, p. 17). Some rambling conjectures and qualifications, worrying about how economists might over-estimate the advantages of governmental regulation, end in his admitting this is merely his personal 'belief' and that what he really wants is that economists undertake explicit policy evaluation (i.e. weighing-up costs and benefits) not reject government intervention (Coase 1960, p. 18).

However, Coase was not as neutral about private property rights, or the social structure of the economy, as some have tried to suggest (e.g. Frischmann and Marciano 2014). This is clear from his own summary of what his work aimed to achieve:

> "[…] the rights which individuals possess, with their duties and privileges, will be, to a large extent what the law determines. As a result the legal system will have a profound effect on the working of the economic system and may in certain respects be said to control it. It is obviously desirable that these rights should be assigned to those who can use them most productively and with incentives that lead them to do so […] this can come about only if there is an appropriate system of property rights, and they are enforced, […]" (Coase 1991).

This makes clear that his approach to the economy, pollution and environmental harm, is embedded-in and delimited by a productivist ideology which is structured around individuals and their property rights.[12] Coase's reduction of the failure to address environmental pollution to high transaction costs is also inherently conservative and restricts policy to the *status quo*. Hence, neoliberals could claim that where voluntary negotiation fails pollution must already be 'optimal' (costs of control higher than the benefits)—a Panglossian flaw in their logic noted by Mishan (1971a). Of course, they also need to negate the counter argument that governments/regulators can use a variety of institutional arrangements that make their intervention more efficient, i.e. cheaper (Coase 1960, p. 17-18). Later a neoliberal fall-back position, consistent with Coase, was advocacy of creating new markets in tradable pollution permits that basically give property rights to polluters and create new environmental commodities (Crocker 1966; Dales 1968). Markets are simply instituted processes, but, contrary to the assumption of neoliberals, they are not necessarily the best institutions for attaining social goals, a point emphasised by Pigou.

As Aguilera Klink (1994) explains, there is really no difference between Pigou and Coase in term of their institutional understanding because both recognise the role of contractual ties in defining a market economy. Both Pigou and Coase accept the central role of institutional arrangements and Coase (1960, p. 29) explicitly notes Pigou as being correct in this regard. However, Coase persisted in caricaturing Pigou (e.g. Coase 1991), ignoring their similarities.[13] He specifically failed to credit Pigou with recognising the importance of contract and law in making an economy operational. Even stranger, Coase (1960, p. 43)

[12] Note, a corporation is an individual according to the law in the USA

[13] That Coase misrepresents Pigou is documented and exemplified in the review by Mishan (1965, p. 29-32) who remarks on Coase's "lengthy, indefinite, and somewhat repetitious arguments" attacking Pigou (*Ibid*, p. 30). Aguilera Klink (1994) notes Coase's biased critique and how he accuses Pigou of lacking clarity in his exposition while himself being unclear and contradictory.

admitted (in apparent total contradiction of the preceding 42 pages, as noted by Aguilera Klink 1994, p. 390) to the overwhelming problems with calculating social costs in productivist monetary terms and that "problems of welfare economics must ultimately dissolve into a study of aesthetics and morals".[14]

The caricature of Pigou by Coase led to the Pigouvian tax being regarded by neoliberals as a seemingly unnecessary regulatory intervention. The caricature of Coase, by his fellow neoliberals of the Chicago School (e.g. Stigler), equated spreading private property rights to everything with defence of American capitalism against government intervention to address pollution. According to Mirowski (2013, p. 335-336):

> "the so-called Coase Theorem was an intentional intervention to undermine and dissolve the whole neoclassical notion of "externalities," and the theory of public goods built around it. […] the neoliberal solution is to enlist the strong state to allow the market to find its own way to the ultimate solution."

This seems true of the use neoliberals made of Coase's work, if not entirely true of Coase himself whose ambivalent and contradictory remarks left the possibility open for different forms of government intervention.

The ensuing dichotomy of pollution policy between optimal tax and spreading private property rights took over two decades to be firmly established. Coase was wrong to assume there was some major consensus about an economic theory of pollution. The 'Pigouvian tradition' was in part created by Coase's article and only took effect once the delimited concept of pollution externalities as a market failure was established within environmental economics.

[14] This vague statement with an illusive meaning is claimed by Coase to be following Frank Knight.

IV. POLLUTION AS AN EXTERNALITY

The origins of the term externality/externalities relating to pollution are hard to trace and its early usage abstract, limited as to practical examples and inconsistent as to implications. In the early 1960s theoretical papers on diseconomies and social costs started using the term and making passing reference to highly simplistic examples of localised industrial smoke pollution. Coase's paper stimulated critical discussion of Pigouvian taxes/subsidies as a means of achieving Pareto optimality when confronting such 'externalities' (Turvey 1963; Buchanan and Stubblebine 1962; Wellisz 1964; Buchanan 1962). An earlier reference using the term 'externalities' is Bator (1958), who includes discussion of the importance of Samuelson's (1954) work on public goods as being connected to aspects of externalities, although Samuelson does not use the term and only makes one brief reference to 'external effects'.

Kapp (1978 [1963], p. 8) attributes the term to the textbook by Samuelson (1961, p. 476) in which he states this to be the divergence between private marginal cost and the "true social marginal cost" (see also *Ibid*, p. 688).[15] Samuelson (1961, p. 475-476) alternates between the terms externalities and external diseconomies. Examples specified are smoke pollution from steel production and urban smog "from each man's auto and factory". Then, rather bizarrely, he states: "The greatest external diseconomy of all results from one country's setting off nuclear bombs", causing genetic mutation, abnormal births and potential for making life impossible. He presumably has in mind nuclear testing (not war), but why this should qualify as an economic (negative) externality goes unexplained. Preceding this,

[15] Kapp cites only p.476, but the main entry is pp.475-476 with a footnote referencing Pigou. Samuelson also uses the term 'external diseconomies'. Additional occurrences of externalities are on pages 478, 678 and 805. The index only references diseconomies (not externalities) and inaccurately, only p.192, where the standard smoke from a factory is mentioned, missing the longer (but still brief) main entry; diseconomies are also mentioned on page 688.

Samuelson has just stated that external diseconomies "are defined as harmful effects that result from one man's production upon other people" (Samuelson 1961, p. 475). What then is the 'production'? There is nothing productive about creating and exploding a nuclear bomb! Indeed what has this to do with anything that might be deemed the realm of neoclassical economics? Perhaps here we see the developing imperialism of mainstream economics as it extends into all fields regardless of the relevance of its ability to provide any scientific knowledge or explanatory insight.

The loose exposition proceeds with Samuelson noting, without references or further examples, that there are "countless examples" of such negative externalities. He then states that: "wherever there are externalities a strong case can be made for supplanting complete individualism by some kind of group action", and an important aspect is "causing free pricing to be non-optimal" (*Ibid*). This would seem to indicate a major and widespread issue, potentially challenging the foundations of economic price theory, its methodological individualism and liberal political ideology. However, after stating "No more need be said at this point about externalities", little more is said and negative externalities/external diseconomies are basically dropped as a topic.

A seemingly independent and earlier source of the term externalities is a paper on watershed management by Ciriacy-Wantrup (1959). He addresses problems in public policy evaluation, especially applied cost-benefit analysis, and questions claims of Pareto optimality. His policy orientation contrasts with the abstract theoretical, mathematical and modelling presentations of other early papers. He notes a frequent argument is "that market prices are the signalling system that steers Western economies toward the social-welfare optimum", so knowing why they do not, and cannot, do so seems important (*Ibid*, p. 215). A three point categorisation is used to structure price system failure: (i) non-existent price signals; (ii) price signals failing to reach decision-making agents, but getting to others; (iii) defined 'distorted'

price signals. Externalities (classical and neoclassical external economies and diseconomies) fall under (ii), and he states that: "In watershed economics, these externalities are discussed largely under the labels 'offsite' and 'indirect' benefits and costs" (*Ibid*, p. 217). In light of the prominence later give to Coase (1960) it is interesting to find Ciriacy-Wantrup had already recognised and emphasised that this was a "vital area for cooperative research between economics and other social sciences, especially law and public administration" (*Ibid*, see also Ciriacy-Wantrup 1952). Water quality management was also soon a pioneering area of pollution research for environmental economists (Kneese 1964; Kneese and Bower 1968).

By the mid-60s Castle (1965), an agricultural economist familiar with the work of Ciriacy-Wantrup, can be found critically discussing policy on pollution externalities. He questions the role of the market and cost-benefit policy evaluation, suggesting the need for non-market institutions. More emphatically he states that: "The economics of quality of the environment is emerging as a problem of major importance" (Castle 1965, p. 548). Realisation of the impacts from agro-chemical farming had been placed in the public consciousness by Carson's (1987 [1962]) best selling *Silent Spring*. Yet, despite this apparently developing and expanding attention to pollution, half a decade later, in his review of the economic literature on externalities, Mishan (1971b, p. 1) noted that:

> "although environmental spillovers have been prominent in the news over the last few years, the bulk of the recent literature has confined its investigations to inter-industry, inter-firm, and inter-person externalities. Economists respond to real world problems with a time lag, initially making use of more familiar, if less relevant, bits of apparatus."

A formalised neoclassical theory of pollution externalities undoubtedly became more widely acknowledged after the establishment in 1974, by d'Arge and Kneese, of the *Journal of Environmental Economics and Management* (JEEM), and in 1978 a related academic association. The practical policy content originally proposed for JEEM was sacrificed to

mathematical models and theoretical expositions that won the journal respect amongst mainstream economists, but embedded its approach in a highly abstract, deductive and restrictive neoclassical framework (Spash 1999, p. 420). Soon an externality theory of pollution was appearing in the new neoclassical textbooks on environmental economics, along with the now dominant idea of optimally internalising externalities via 'Pigouvian taxes' as opposed to less efficient regulation via legally set standards (e.g., Pearce 1978 [1976]; Mäler 1974; Baumol and Oates 1979).

In general, environmental economists concentrated on developing means of correcting markets by taxes/subsidies and only later by creating new markets in pollution rights (e.g. Tietenberg 1985). Optimal pollution control policy was backed by extending cost-benefit analysis to calculate environment externalities (Kneese 1984). Others, like Baumol and Oates (1971), dropped the pretence of precise monetary calculation of externalities, and advocated 'somewhat arbitrary' pollution standards, but still recommended pollution taxes (i.e., pricing) to attain them because "prices can achieve a specified reduction in pollution levels at minimum cost to the economy" (*Ibid*, p. 42). This more humble position qualifies the pollution externality approach, but the paradigmatic positions of reliance on market efficiency, pricing and cost-benefit analysis remained. As Mirowski (2013, p. 335) notes: "the neoclassical solution is for the state to mimic the way an ideal market should have performed, in order to rectify these unfortunate lacunae".

In fact, textbook expositions maintained treatment of environmental problems as minor aberrations in an otherwise perfectly functioning price-making market system. The 'Pigouvian tax' did not equate to the State running the economy. As Beckerman (1972, p. 327) assertively and arrogantly stated:

> "most of my economist colleagues have always known […] that the problem of environmental pollution is a simple matter of correcting a *minor* resource allocation

problem by means of pollution charges, and that most of the common objections to such a policy can be demolished with the aid of no more economics than that which is the stock-in-trade of any second-year economics student". (emphasis added)

The early environmental economics textbook by Pearce (1978 [1976]) included chapters promoting "Methods of Securing the Optimal Amount of Pollution" and "Cost-benefit Analysis of Pollution: The Practice". He persisted in championing this approach throughout his life (Pearce, Markandya, and Barbier 1989) and even for greenhouse gases (Pearce 2003). Hence the rhetoric of 'internalising externalities', and 'getting the prices right' to 'solve' environmental problems, became part of the paradigmatic dogma of correcting these anomalous market failures.

V. POLLUTION AS A COST SHIFTING SUCCESS

Interestingly, the conceptualisation of pollution as externality, and associated correction of market failure via pricing, was already contradicted by environmental economists' own work on the laws of physics (Kneese, Ayres, and d'Arge 1970a). What was termed 'materials balance theory' incorporated the law of conservation of mass (i.e. mass can neither be created nor destroyed). The conclusion was that pollution is all pervasive and a normal part of economic activity. Externalities associated with the disposal of residuals from modern consumption and production activities cannot then be treated as exceptional, rare or unimportant. As Kneese, Ayres and d′Arge (1970, p. 4-5) make very clear:

"In reality they are a normal, indeed inevitable, part of these processes. Their economic significance tends to increases as economic development proceeds, and the ability of the natural environment to receive and assimilate them is an important natural resource of rapidly increasing value. We suggest below that the common failure to recognize these facts in economic theory may result from viewing the production and consumption

processes in a manner which is somewhat at variance with the fundamental physical law of conservation of mass."

An almost identical passage appears in Ayres and Kneese (1969, p. 282-283). There they criticise their colleagues discussing pollution for regarding such diseconomies as "freakish anomalies" (*Ibid*, p. 287). They admonish the economics profession as follows (*Ibid*, p. 282):

> "Despite tremendous public and governmental concern with problems such as environmental pollution, there has been a tendency in the economics literature to view externalities as exceptional cases. They may distort the allocation of resources but can be dealt with adequately through simple *ad hoc* arrangements."

Their own perspective is cited as being like that of Kapp (1950). They recognise that addressing pollution as an externality to be internalised via market prices "implies a central planning problem of impossible difficulty, both from the standpoint of data collection and computation" (Ayres and Kneese 1969, p. 295). Once the all pervasiveness of pollution is apparent, due to economic growth and the laws of physics, then so also is the way in which pollution is misconceptualised as 'external' to actors decisions rather than internal to economic agents *modus operandi* in any competitive capital accumulating economic system. All of his would seem to suggest a radically different theory of pollution from that in the impending textbook approach.

Yet, Ayres and Kneese exemplify the paradigmatic conflict. While recognising the scale of the problem, and impossibility of the neoclassical 'solution', they proceed to employ a neoclassical general equilibrium model where pollution becomes a correctable market failure. Pollution problems arise "because there exist no social institutions that permit the resources in question to be 'owned', and exchanged in the market" (*Ibid*, p. 291). They then immediately claim allocation of resources corresponding to a Pareto optimum requires moderation by a market or a surrogate, i.e. simulation via shadow prices. In another

contradiction, they add that "the problem of achieving Pareto optimality reaches beyond devising appropriate shadow prices and involves the planning and execution of investments with public goods aspects" (*Ibid*, p. 295). Their conclusion continues with a disconnected recommendation of both "planning and control" in regional economies and devising pollution policy on the basis of estimating the monetary value of externalities and control costs (*Ibid*, p. 296).

The inconsistencies and failures to pursue the logic of their original natural science insights arise due to paradigmatic conformity. As Kapp (1969, p. 334) explains: "Economists brought up in the neoclassical tradition of micro and general equilibrium analysis have frequently chosen to protect the conventional system by introducing new or more explicit assumptions in an effort to strengthen the model against the obvious theoretical challenge raised by social costs." Kneese, as a leading environmental economist advocating cost-benefit analysis, increasingly embraced the neoclassical paradigm in contradiction of physical realism. In paradigmatic contrast, Ayres, who was trained in physics, broke away from neoclassical economics to help establish the field of industrial ecology (Ayres and Ayres 1996; Ayres and Simonis 1994). This developed ideas of social metabolism (see Krausmann 2017), which later connected to Karl Polanyi's substantive economics, taken as favouring an explicit commitment to planning over price-making markets (Gerber and Scheidel 2018). The revolutionary potential of environmental economics can then be seen as having been dependent upon how far different economist were prepared to take the logic of their arguments in contravention of the paradigmatic neoclassical belief in doing what price-making markets would ideally do.

Another exemplary case of paradigmatic conformity is d′Arge who co-founded JEEM with Kneese and, similarly, thereafter maintained neoclassical conformity. In total contrast to such conformity he co-authored the book on materials balance theory recognising pollution as

all pervasive (Kneese, Ayres, and d'Arge 1970b). Complementing this critical insight, in a little know article with Hunt, he explores the idea of a total reinterpretation of social relationships integral to mainstream economic understanding (Hunt and d'Arge 1973). This article shows how the combination of pervasive pollution with standard economic assumptions about agents and markets turns economic theory on its head. The argument runs as follows. *Homo œconomicus* will maximize the value of participating in organised markets and creating nonmarket transactions. Such agents gain by imposing losses on others, and they gain more the more they can shift costs on to others. The same incentive Adam Smith regarded as producing only unintended good is responsible for selecting only highly productive 'external effects'. All individuals acting independently to 'externalise costs' will yield a maximum of these costs imposed on others. Rather than the benevolent invisible hand, guiding the allocation of resources to the benefit of all, the capitalist price-making market economy had an 'invisible foot', continuously booting the majority of people in the backside (Hunt and d'Arge 1973, p. 348). Successful agents shift costs on to others to the maximum of their ability and must be paid, or rather bribed, to reduce their damaging activities by the recipient of their costs. Such ideas were totally contrary to the conceptualisation of pollution externalities as correctible market failures that was central to the new neoclassical environmental economics.

Nothing of the 'invisible foot' thesis was in fact novel or original in the early 1970s. Kapp (1950) had published his major work twenty years earlier based on a Marshallian approach to pollution, but including his important insights into social cost shifting; a position apparent from the first sentence of the 1948 preface (Kapp 1971 [1950], p. xxvii). In his later revised work the limitations of and divorce from the neoclassical framework was made even more forceful and explicit (Kapp 1963). Going in the opposite direction to environmental economists, the need to move beyond the conceptualisation of social costs as externalities was

made increasingly clear by Kapp (1969, 1970). His work offers an extensive and thorough exploration and explanation of social cost shifting, all be it without the connection to the laws of physics, which only strengthen his argument.[16]

Kapp recognised, on social and institutional grounds, that despite the increasing discussion of externalities, what remained unrecognised, or deliberately supressed and assumed away, was that "these so-called external diseconomies and social benefits are not isolated cases but are widespread and inevitable phenomena under conditions of business enterprise" (Kapp 1978 [1963], p. 8). Kapp rejected the idea of pollution as an externality because it inaccurately describes what are deliberate acts of cost shifting in the search for profit; a critique that corresponds to that of institutional economist Clark's theories concerning the operation of the firm (Berger 2017, p. 99-114). Accordingly, success in business is achieved by passing on costs to others, and/or taking benefits from them without incurring personal costs.

Kapp (1978 [1963], p. 14) defines social costs as harmful effects and inefficiencies shifted to others that are: (i) avoidable and (ii) part of productive activities. For example, businesses might avoid or minimise harmful pollution created in their production processes, but instead expose their workers and the wider environment to increase profits. The pursuit of private gain places a premium on the minimization of the private costs of current production, and the more that this is emphasised the greater the probability of social costs. The implication for neoclassical theory is that price-making markets do not achieve efficient outcomes nor can price adjustments to competitive markets be understood as in any sense optimal. Prices reflect the power and ability to realise cost shifting.

[16] Shortly before his death he had become aware of this through reading Georgescu-Roegen (1971).

> "For if economic units with unequal power are able to shift part of their costs to others—and moreover are able to plan their sales and hence consumers' demand through sales promotional activities—market costs and prices must be regarded as more or less arbitrary and indeed unreliable measures of economic rationality." (Kapp 1969, p. 335)

Production and allocation set within price-making markets is highly problematic because this institutional structure actually incentivises social cost shifting. "Pollution effects are not minor side-issues and cannot be easily corrected by ad hoc measures of legislative control, chosen and preferred because they are more or less compatible with the market system" (Kapp 1971 cited by Berger 2017, p. 184). The problem is the market system itself.

There is then a failure at the heart of neoclassical economics as a means for addressing environmental pollution and other social costs.

> "For the fact that private entrepreneurs are able to shift part of the total costs of production to other persons or to the community as a whole, points to one of the most important limitations of the scope of neoclassical value theory. As long as it continues to confine itself to market value neoclassical economics will fail to assimilate to its reasoning and to its conceptual system many of the costs (and returns) which cannot be expressed in dollars and cents." (Kapp 1971 [1950], p. 11)

In his original work Kapp (1950) does offer estimates of some annual monetary costs of air pollution, but as indicative of the problem not definitive of a shadow price, and along with physical measures (e.g. mortality, morbidity, material decay, pollutant deposition). More generally, physical measures of pollution are required because the concern is impacts on the needs of all. Maximum tolerable levels of air and water pollution, minimum health standards, preventive medicine, medical care and education should be established to counter the failures of markets to achieve them. Economists should reform their subject to focus on "an

objectification of the content of individual needs and social welfare in terms of existential social minima" (Kapp 1965, p. 67). That is, for example, an acceptable level of air pollution in an urban area is not a matter of financial returns to polluters over and above what the polluted will accept in compensation, or the ability to pay of the polluted to compensate polluters to stop inflicting harm. Distribution of harm in society is inherently an ethical and political issue about social and collective goals.[17]

Kapp recognised that industrial managers in planned economic systems operating under competitive institutional arrangements are just as liable to shift costs as profit seeking capitalists operating in competitive market systems. The analysis applied equally to a Russian Soviet style incentive system as to that of the Western market economies. Indeed, the problem might be found in any productive activity where the emphasis is placed on competing with and achieving advantage over others or obtaining income by causing damage to others. Municipalities and public or planning authorities might create environmental degradation by attracting industries to increase their tax income, sacrificing environmental quality for revenue, or seeking short-run solvency by ignoring social costs (Kapp 1971 [1950], p. xvi). Thus, long before the spread of 'new public management', Kapp warned that attempts to make public decision-making more economically 'rational' could backfire (*Ibid*). In recent decades, urban sprawl, gentrification, shopping malls, industrial parks and the general drive for growth might all be seen in this light, as income generating competitively driven costs shifting.

Social cost shifting appears prevalent from littering to dumping toxic chemicals in rivers or exporting electronic waste from global North to South. While Kapp's thesis is primarily directed at productive activities, the problem of cost shifting is also evident in consumption and activities at the level of the household. This highlights the need to address

[17] As fleetingly noted by Coase (1960, p. 43) in his contradictory reference to Knight.

the structure of consumerist throwaway society, of which Kapp (1978 [1963] chapter 12) addressed some aspects, such as high pressure sales promotion and psycho-cultural impacts. More generally this relates to what Brand and Wissen (2017) term the imperial mode of living and Hornberg (2017) terms unequal exchange. The same institutional dynamic of cost shifting underlies both. The problem then becomes systemic and self-reinforcing between production and consumption.

Kapp (2011) recognised and explained such structural phenomena as circular cumulative causation. This describes how social mechanisms are established that create feedbacks, reproduce social processes and accentuate the occurrence of specific behaviours. Gunnar Myrdal's work on institutional racism is a good example of applying such analysis (Berger 2017, p. 188). This also highlights the aspect of institutionalism in Kapp's theory. He had written extensively on the link with institutional economics and highlighted this as a central concern of his work on social costs.[18] Consistent with Kapp, institutions can be understood as ranging from conventions to norms to rules and regulations (Vatn 2005). Such institutions structure social interactions and create mechanisms that encourage some behaviours and restrict others. Achieving collectively determined social goals and objectives then becomes the aim of explicitly designated economic institutions. This stands in direct contrast to the unregulated self-interested individualism forming a central axiom of neoclassical economics and placed at the core of neoliberal ideology.

Kapp then advocated government regulation and planning as a means to achieve socially acceptable standards for pollutants, e.g. natural balance, maximum permissible

[18] Bringing the work closer to a tradition in institutional analysis was given as the reason why he had adjusted the book's title (see the preface dated 1962 for the second edition of his book on social costs Kapp 1978 [1963] xxvii). Another book specifically addressing the foundations of institutional economics was left incomplete when he died, but was finally published after some diligent research and editorial work by Berger and Steppacher (Kapp, Berger, and Steppacher 2011).

concentration, safe minimum standards and objective requirements of human health (Kapp 1978 [1963], p. 93). This corresponds with a critical institutional economic approach that emphasises the cumulative character of social causation and the need for objective criteria of social welfare for the appraisal of the social efficiency of economic systems. It also raises the importance of addressing the quality of human life and behaviour under different institutional arrangements (Kapp 1978 [1963], p. xxvii).

Thus, in Kapp's work, pollution is one amongst many costs that are shifted to and borne by third persons and the community as a whole. Externalities are not external to economic actors decisions, but part of how the modern growth economy, and its profit seeking and utility maximising self-obsessed actors are incentivised to behave within the competitive institutions of the price-making market system. Cost shifting can be seen operating both environmentally, via pollution, but also socially in the relationships of the work place and the institutions of consumerism. This is a fundamentally different critique than the 'all social costs are minor problems and can be optimally fixed by taxes' approach attributed, misleadingly, to Pigou, or the 'lets allocate private property rights and leave agents to seek their own selfish-interests' approach attributed, equally misleadingly, to Coase. Both those approaches assumed societal choices should be left to individual agents ignoring the formation of social goals as distinct from individual choice. Kapp also noted how such individual choice models ignore the variety of actual contexts and institutions within which decision are made and that this affects the outcome. Kapp was working towards a new 'social economics' with a realist descriptive and explanatory approach (Spash 2012).

Despite his originality and publishing substantively on pollution decades in advance of others, Kapp's work failed to impact substantively on the new economics of the environment. It was indeed an attack on the foundations of neoclassical economics which meant those who chose to embed themselves in that school could not pursue the logic of cost shifting. The

distinction between unintended minor marginal external costs and deliberate cost shifting for profit meant mild reform was replaced by the need for systemic change. As Kapp (1971 [1950], p. xiv) noted, his critical view ran counter to the presuppositions and biases of conventional economic analysis and as a result did not meet with general approval. In his review of the post-war literature on externalities Mishan (1971b) did not even bother to mention Kapp's work. American institutional economists gave him the most recognition (Berger 2017, p. 24),[19] but they themselves were losing ground within the profession and being replaced by a mix of neoclassical modellers, econometricians and neoliberals.

VI. DISCUSSION AND CONCLUSIONS

Environmental economists know the market fails to price all the benefits and costs associated with the use of natural resources and the environment. However, this perspective has been constrained lest it go too far and threaten the political utopian project of achieving an (ideally) unregulated price-making market economy. A fundamental point of contention in the environmental economists approach is the importance they can afford to give to pollution. The recognition that pollution is all pervasive overthrows the idea that markets can operate as socially efficient means of achieving a Pareto optimal outcome. If corrective intervention is widespread then the self-regulating price systems is replaced by central planning. Thus, the response was to caricature the problem and impose paradigmatic limits that removed all theoretically disturbing aspects of social and physical reality.

There is in this an underlying ideological battle. Environmental economics developed during the cold war in the USA and so adopted facets of political ideology from that context which have ever since been employed against the environmental movement. This has meant denouncing planning under the rhetoric of 'command and control' in opposition to the 'free

[19] The title of Kapp's (1963) revised work relates to Veblen's *Theory of Business Enterprise*.

market'. A hidden ideological and political discourse has then been employed to frame the debate as totalitarianism vs. democracy, communism vs. liberalism, evil vs. good. Standard setting, planning, regulation and socialism were pushed off the agenda. There would be no repeat of the socialist calculation debate. The environmental economists approach was to be cleansed by rejecting administered (or other forms of) set-prices, for achieving a range of social provisioning goals (e.g. just, fair and equitable allocation), in favour of taxes set to reflect monetised externalities that help correct markets to achieve efficiency by 'getting the prices right'. Price-making markets then appear as correctible, if not perfectible, and are always the ideal against which policy is to be measured. The struggle over environmental economics was short lived and soon over. By the 1980s, despite remaining distinctions, the field had become disassociated from any planning approaches and allied to the neoliberal position of a strong government empowering the market to find its own way to the ultimate solution.

The understanding of pollution recognised by Kapp (1950) and twenty years later recognised and (supposedly) adopted by Kneese, Ayres and d´Arge was within another decade eradicated from environmental economics and the dominant discourse established in the new textbooks. Cost shifting and Kapp's writings were quite simply ignored once environmental economics became incorporate into the deductivist mathematical mainstream. An ideological commitment to market institutions was combined with a paradigmatic belief in optimal prices that allocate resources (Pareto) efficiently. Pollution as a marginalised concern external to the economic agent was assumed easily correctible allowing markets to function *as if* self-regulating institutions. The position was established despite repeated recognition of problems going back to Pigou (1920). Along the way, Pigou was caricatured by Coase as an advocate of government intervention via optimal taxes. Coase's contradictory, vague and elusive arguments, making false claims and lacking references, earned him a Sveriges

Riksbank ('Nobel') Prize. While Stigler, another prize winner, produce a neoliberal 'Stigler Theorem' that he attributed to Coase, where property rights and new markets solve the failings of market capitalism.

Environmental economists also denied their own foundational ecologically and physically based insights in order to conform with neoclassical economic theory. The orthodox treatment of pollution events as minor correctible market failures was know to conflict with the realisation—already apparent in the 1960s and the then emerging field of systems ecology—that production and consumption in a modern economy continuously creates harm on a scale and with consequences that are major problems for human society as well as non-human Nature. At the end of the day, environmental economics became a narrow, constricted, self-defeating and dogmatic approach that offered neoclassical conformism and market reformism that increasingly sided with neoliberal capitalism.

The rise of neoliberalism hollowed-out central government and replaced it with central corporatism. The successful dichotomisation of the recommended policy response followed and became part of economic dogma for addressing pollution as an externality. The 1st edition of the New Palgrave dictionary provides a useful authoritative summary:

> "The standard remedies for these market failures involve *minor modifications* of the market mechanism, including Pigovian taxes (Pigou, 1920) on harmful externalities, or appropriate Coasian (Coase, 1960) legal entitlements to, for example, clean air." (Feldman 1987 emphasis added)

In the 2nd edition (2008) this was updated to change one word 'minor' to 'various', and the statement remained unchanged in the 3rd edition (2018). This is the state of the art in mainstream economics on pollution.

The justification for government intervention today remains that prices, whether adjusted directly by taxes or indirectly by new pollution permits markets, can be used to

reflect resource scarcities and allow the operation of (otherwise unregulated) price-making markets. For environmental economists the extent of any externality (i.e. harm created to others both human and non-human) can be assessed through monetary valuation, which can also determine the optimal level of pollution by setting the value of all the harms against the costs of pollution control. Corrections to prices (e.g. via taxes) are supposedly objectively calculable 'shadow prices' reflecting individual's 'true' preferences and can be estimated using a range of monetary valuation methods. These have been extended from revealing preferences in actual markets to inferring values for everything—from cultural monuments to biodiversity loss to human life—based on hypothetical market-like trade-offs from stated preferences. Regardless of the scale or complexity of the problems or their extent, in time or space, economists will be able to recommend whether, and to what extent, action is required to achieve the (Pareto) efficient level of pollution going into the environment.

A prime example is human induced climate change. A high profile internationally acclaimed study by Stern et al. (2006) on the economics of climate change earned its lead author a professorship, knighthood and seat in the UK's House of Lords. The report refers to climate change as "the greatest market failure the world has ever seen" (*Ibid*, p. viii, 1), and then claims this can be corrected by adjusting prices to include the value of the externalities. Hence: "The first essential element of climate change policy is carbon pricing" (*Ibid*, p. 308). Tradable pollution permits could send the price signal. Two further neoliberal policies were recommended: supporting private sector innovation to produce more efficient technology and incentivising individual consumer responsibility. Stern et al. was merely one in a line of economic studies claiming to have actually calculated a policy relevant monetary valuation of the social costs of human greenhouse gas emissions, the magic optimal number defining efficiency (see Spash 2002). In 2018, environmental economist Nordhaus, the longest running publisher of such numbers, received a Sveriges Riksbank ('Nobel') Prize. In 2019,

over 3000, mainly American, economists, including 27 other Riksbank Prize winners, endorsed a 'carbon tax' because "[s]ubstituting a price signal for cumbersome regulations will promote economic growth".[20] The tax, *à la* Beckerman, is treated as if a minor adjustment that will allow an otherwise self-regulating capitalist market system to (Pareto) efficiently allocate resources. Faith in the paradigms of economic growth and price-making markets remains unshaken in the face of climate catastrophe.

Kapp describes a very different world from the now hegemonic neoliberal-neoclassical synthesis. The capital accumulating economy, with its emphasis on competition and individual self-interest, is the road to social misery and environmental destruction. The social metabolism of the economic structure needs to be explicitly planned and the institutions of exploitation and alienation deconstructed and replaced by those of social inclusion. Environmental and social harms need to be addressed via social minima to provide for basic objective needs and protection of the innocent from harm. Monetary environmental valuation is neither theoretically sound nor practically useful, and results in misdirecting public policy. Planning not markets are the favoured approach and this requires participation, accountability and multi-level governance. This is the agenda awaiting a radical social ecological reformation of economics.

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