

# THE NATURE OF INTELLECTUAL PROPERTY IN THE MID-TWENTIETH CENTURY

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We have become very familiar with the issues and slogans of today's intellectual property debate in the contexts of globalization, the commercialization of science, the "enclosure" of the intellectual commons, and the seemingly endless willingness of our political representatives to extend the length and strengthen the protections for copyright. What I want to do here is to point to some arguments advanced in the mid-twentieth century that, I think, place our current debates in an unfamiliar light. Their authors included some of the period's most influential economists and scientists, among them being one of the figures most frequently identified as a founder of the modern information age. What we find when we look back at their claims – which framed an emerging policy debate about IP in the scientific and commercial worlds – is that the social and political affiliations we now tend to associate with particular intellectual positions were not always there. Indeed, some of the associations current in the 1930s-60s now look to us very strange indeed. Restoring this history to view may therefore help us to disassociate some positions that have generally come to be regarded as near-inevitable allies, and to associate some positions that we have assumed to be intrinsically inimical to each other. In other words, it helps us remember that positions in this debate are conditioned as much by history as by logic.

I want to discuss four examples. These are: (1) Arnold Plant; (2) Ronald Coase; (3) Michael Polanyi; and (4) Norbert Wiener. These four are to some extent self-selecting. Although they are merely the most visible protagonists of a debate about cultural property in the 1920s-50s that was every bit as vehement and public as our own,

they each had unusually important and consequential things to say in that debate. I choose them partly because their contributions range across the cultural field – from industrial science in Polanyi’s case, through the broadcast media in Coase’s and publishing in Plant’s, to “information” itself in the case of Wiener. So they give a good sense of the broad scope of this debate. Their choices of genre, too, are interestingly broad: these men argued their points in academic papers, trade books, monographs, essays, and, in one case, a novel. Yet, for all that, their shared foci also give a good impression of what, fundamentally, seemed then to be at stake in the emergence of an information economy policed by rules of intellectual property. And what seemed to be at stake were much the congeries of topics that we ourselves now agonize about so much: liberty and property; the public good and the rights of inventors; the commercialization of creativity and the ideal of the creator; the effects of monopolies and the need to search for knowledge. In that light, it may even be the case that some of the arguments restored to view here could remain salient today.

### *Arnold Plant and the licence of right*

I want to begin with midcentury neo-liberalism – the movement, perceived by itself to be embattled, to preserve and revive classical economic doctrines in the face of the kind of Keynesian interventionism championed by New Dealers in the US and both Tory and Labour administrations in Britain. A major (yet now partly forgotten) part of this movement’s clamor against state intervention concerned matters of cultural policy – broadcasting regulation, cultural monopolies, and, of course, intellectual property.

The central theme in the radicals’ critique of such intervention was the hoary one of monopoly. If monopolies were always bad, as neoliberals assumed they were, then on what basis could information monopolies be defended? Copyrights and patents were artificial (indeed, state-created) monopolies of this kind; *should* they even be defended? As early as the 1930s, Arnold Plant (1898-1978), engineer-turned-economist at the LSE and later one of the foremost members of Friedrich Hayek’s Mont Pèlerin Society, was mounting a stringent critique of both regimes on this basis.

Interestingly, Plant began his discussion of copyright in 1934 with an approving citation of H.C. Carey, the Philadelphia protectionist who had been pivotal to American opposition to international copyright in the previous century. Carey, who had explicitly endorsed the unauthorized reprinting of his own works in Europe in order to disseminate his views, had been one of very few writers to acknowledge an interest in the issue of copyright by virtue of being an author himself. Plant admired this candor. Since authors were interested parties, he remarked, readers would do well to treat the overwhelming public consensus on the benefits of copyright with skepticism on *cui bono* grounds. Plant then proceeded to excavate a long history of argument against legal forms of intellectual property, leading from Carey down to his own day. His conclusion was that one could reconstruct a forgotten tradition arguing that copyright was indeed a monopoly, and one that elevated prices, provided an entirely indiscriminate encouragement for risky publications, and was in many cases unnecessary (the frequent republication of classics in many different formats providing abundant proof of this). Perhaps, Plant mused, it should even be abolished.

Plant did not shrink from advancing the thought experiment of a publishing realm lacking *any* copyright. He found such a prospect eminently conceivable, not least because for many books – academic monographs, say, or poetry – copyright was already irrelevant, as it had been in the sixteenth century before all modern copyright law. “For such writers copyright has few charms,” he remarked. They simply wanted their creations dispersed as widely as possible, and copyright actively hindered that dispersal. Now, professional authors were at first glance a different matter. It was clearly true that restricting reprinters would increase their rewards, since, as monopolists, their publishers could restrict supplies and boost prices. But this alone was no reason for the public to cede them such power either. The drawbacks were too obvious. Even copyright’s advocates could defend it only by claiming that a guessed-at alternative (typically one of patronage) was even worse. But Plant pointed out another alternative. In the late Renaissance printers had produced plenty of books despite the absence of copyright. A culture of reprinting had come into existence then that he likened to that of knock-offs in the world of high fashion in the modern era. Clearly, Milanese houses did not fold because high-street chains imitated their designs, and the high-street chains in turn did

not fold because cheap merchants imitated their imitations. In the nineteenth century, something similar had obtained in transatlantic publishing, with many British authors receiving substantial incomes from American publishers (of which Carey's was one of the biggest) despite the absence of international copyright. The need to be first in a market coupled with the "tacit understanding among the larger publishers in America that the books published by one should not be pirated by another" were sufficient bases for such transactions.<sup>1</sup> If an American rival violated this "understanding," Plant remarked, then the big publishers would produce "fighting editions" to undercut them, much as London bus companies in the 1930s used "fighting buses" to combat pirate operators. So it might be possible to have a vibrant publishing world ruled, to the limited extent that it needed to be ruled at all, by conventions rather than by doctrines.

Plant was also skeptical of the argument that the high prices produced by the copyright monopoly were needed to compensate for the unusual risks involved in publishing. This was an old argument, he found, that had first been made in the seventeenth century. But it amounted to advocacy of a tax on good books to pay for bad books. And its effects had been evident by the mid-nineteenth century. By 1842 voices were already being raised against the high prices associated with long copyright terms. They made British books far more expensive than American, and fostered the convention of three-decker novels distributed through circulating libraries which got them at less than wholesale price. The libraries then acted as a powerful lobby against the lowering of prices. This was almost an archetypal description of the bad effects introduced by a monopoly and its hangers-on.

The abolition of copyright being an unrealistic proposal, Plant reverted to the alternative of compulsory licensing. He found that such a system had first been proposed back in 1837 by an official of the British Museum, since when the notion had often been revived – and equally often opposed, most vehemently by Herbert Spencer (for whom, Plant acidly remarked, students of philosophy were evidently "fair game for monopolistic authors"). It had actually been tried first in Italy in the 1860s. But it was notorious in Plant's day for having been defended by Frederick Willetts, the self-proclaimed "King of the Pirates," before Parliament in the 1900s. Willetts's music-publishing struggles of the

early century, when “those who prefer such language might say that the trade coolly pirated musical works,” had in the end led to compulsory licensing finally being accepted in Britain. 1911 saw the principle introduced for copyrights in general. They became subject to a compulsory royalty for the last 25 years of their protected terms. Plant approved: here was a system that truly avoided the perils of authorial monopoly to the greatest possible extent. Yet the internationalization of copyright on Berne principles, which did not recognize compulsory licensing, rendered the retention of such a system in any one state hard. Plant wanted to fight to achieve its retention, and even its extension. He proposed that the period of copyright monopoly be reduced drastically to about five years, and the compulsory royalty principle correspondingly extended.<sup>2</sup> After WWII he would see this fight renewed and, in rather short order, lost.

Plant extended the same argument to patents for invention. Again, he began by recalling a forgotten history of campaigners in the mid-nineteenth century who had sought to abolish the entire system. He was able to cite the testimony of none other than Brunel in 1851 that it diverted too many people into seeking patentable inventions when they would be better advised to improve existing techniques. And there was plenty of empirical evidence that invention proceeded apace without patents: in biology, for instance, plant breeding continued (an example that today seems very ironic); so did medical research (ditto); so did the whole gamut of scientific discovery (ditto again). Besides, patents, where they were granted, created an artificial and false authorship – in reality, discoveries and inventions were far more collective products. Finally, patents created the real risk of blocking future discoveries that might transgress too many property rights. The compulsory licence (licence of right) concept could, Plant maintained, mitigate all these problems.<sup>3</sup>

### *Ronald Coase and the monopoly of information*

Amid these criticisms of copyrights and patents for their roles as constraints on the circulation of knowledge, the *mechanism* of communication also came in for attack. The

common core shared by the two debates was the issue of information monopolies. And the biggest of those monopolies in the mid-twentieth century was imperial Britain's BBC.

The neo-liberal critique of public-service broadcasting rested on much the same views about knowledge, science, and creativity that underpinned Plant's case against copyrights and patents. In particular, the neo-liberals developed a radical attack on British broadcasting policy that coincided with, and mutually endorsed, Plant and others' assault on contemporary principles of intellectual property. That attack was to be revived in the 1960s amid the pirate radio boom, and in a strange way to play a part in the origins of Thatcherism.

The centrality of the BBC in such arguments – its centrality, that is, not just to debates about broadcasting, but to those on economics, the role of the state, and the nature of creativity – dates back to its foundation. In 1926 Keynes himself had touted the role of it and similar “semi-autonomous bodies within the State” as marking “the end of *laissez faire*.”<sup>4</sup> If Keynes was right, then any project for the *resurrection* of *laissez-faire* would need to begin by taking on the BBC. And this was what happened at the hands of Ronald Coase – and, in league with Coase, at the hands of Plant too.

This debate took many forms, but looming large was the huge question of how to organize and regulate broadcasting itself so as to serve the public good and minimize interference. Since the early 1920s, British broadcasting had effectively been constrained to a public-service monopoly, the BBC. It was a very different conception to American radio, which was often portrayed (rather inaccurately, but that is another story) as a free-for-all. At any rate, the fact of a monopoly broadcaster existing in Britain made Britain the locus for much of the debate over broadcasting, information, and politics for the next generation.

The corporation was an independent organization, but one with an ethos of public duty. It was funded by licence-fees paid by all households owning a receiver, at least in theory: many probably never bought licences, a dodge that actually brought the BBC to its knees in its early years. Such “piracy” was countered by extensive police measures, such as the use of direction-finding antennae inherited from war-surplus submarines, that

to Americans seemed to confirm all their suspicions of the totalitarian tendencies of public control of the ether.

The BBC had long been assailed by parts of the press, but in the late 1930s the confrontation with totalitarian regimes gave such arguments new venom. Sir Ernest Benn, lone voice at the Society of Individualists, lambasted the “microphone monopoly,” calling it “only one degree less serious than the more formal Continental censorship.” The BBC, he warned, was “the child of the modern determination to govern everything.” In the hands of the central planners, its long-term impact must be “absolutely fatal to any system of self-government.”<sup>5</sup> More tellingly, some of the same criticism was leveled at the corporation by its own former staff. Richard Lambert, one-time editor of the BBC’s magazine, *The Listener*, detailed its high-handed attitude to both employees and audience; Paul Bloomfield confirmed that such attitudes had survived Lambert’s departure in 1939; Chief Engineer P.P. Eckersley likened the corporation to a medieval robber baron controlling passing river traffic; and even the erstwhile Director General, Sir Frederick Ogilvie, weighed in, warning in a letter to the *Times* that “monopoly of broadcasting is inevitably the negation of freedom.” Each writer saw the BBC’s advance as evidence of a far broader collectivization of culture – Lambert accused it of exhibiting traces of “fascist” thinking, and Bloomfield of furthering a dehumanizing mechanization of culture that had begun in the industrial revolution. Each advocated licensing commercial rivals to halt that process, and each argued that this would be essential to preserving “individualism” in general. Lambert even evoked Belloc’s old “servile state.” Eckersley’s critique, as befitted the work of an engineer, was by far the most technically specific. He lauded the efforts of commercial broadcasters like Radio Luxembourg and the IBC (a very successful outfit based in Normandy and London and run by a one-time Tory MP), but acknowledged the problems they faced in challenging the BBC in the ether. He identified the prime cause of the monopoly as “The old, old problem – too many demands for channels.” This problem was endemic to wireless broadcasting, he conceded, such that each usable wavelength “gradually assumed the form of a national property.” And the nation to which it belonged naturally wanted to see it used “for cultural rather than commercial purposes.” All this being inescapable, Eckersley fought determinedly for a broadcasting system that abandoned wireless transmission in favor of

wires – in which case the problems of limited wavelengths and interference would disappear at a stroke. In a remarkable prophecy, he forecast a day when cabled citizens would be freed from the BBC's monopoly and made able to access information from anywhere in the world at the press of a button. They would even be able to print out their daily newspaper, by means of the same cable hitched to a household printing machine.<sup>6</sup> Remember: this was the BBC's own erstwhile chief engineer speaking.

The periodical press joined in with its own criticisms of the monopoly system. *Round Table* called it an “astonishing paradox” in a nation setting great store by rhetoric of freedom, and endorsed Eckersley's vision of wired broadcasting.<sup>7</sup> And in 1944-46 *The Economist* published a powerful series of articles against the monopoly. “It is almost incredible that any democratic country should have allowed itself, through a series of accidents, to create a monopoly of the greatest means of influencing public opinion since the invention of printing,” the magazine pronounced. “Any suggestion of a state monopoly of the printing press would be met with a storm of protest.” The *Economist* argued that either the advent of FM broadcasting or the creation of a wired system would eliminate the old problem of wavelength scarcity, and, this being so, argued for replacing the BBC by three separate companies, all funded primarily by licence fee, with listeners deciding where part of their payments would go.<sup>8</sup>

The only event in human history at all comparable with the invention of radio, from the social point of view, is that of printing. What would have happened to our liberties – indeed, to our intelligence – if the printing press had, from the start, been monopolised by a public corporation, be it never so well-intentioned and devoted to its duty? For centuries now, it has been common form among the western democratic peoples to look down upon any benighted country which reserved the power of the press to Authority, and to pity it not only for its political captivity but also for its ignorance, the intellectual backwardness and the technical poverty that are the inevitable consequences of a censorship. So firmly is this doctrine held, that the smallest infraction of it, if it relates to printed matter, will be hotly resented and condemned. Yet a complete breach of the same doctrine, relating to an instrument that may yet prove to be still mightier than the pen, is looked upon with complete indifference. There is still time – but probably only just time – to remedy this disastrous mistake. If radio is to be the servant of a free society, and not its assassin, it must follow in the printers' footsteps; it must regard itself as a free medium and be prepared to put out to the world virtually

everything that is offered to it – subject, of course, to the laws against libel and indecency. Only so can radio avoid becoming a prison for the human spirit.<sup>9</sup>

These critiques culminated one of the most perceptive studies of the BBC ever written – and certainly the best attack on it. This was the work of Mont Pèlerin Society stalwart and future Nobel laureate Ronald Coase (1910- ). Coase, the son of a telegrapher, had been brought up on issues of telecommunications. He studied with Plant at the LSE while the latter was composing his attack on copyright. Later he visited the US several times, most notably at the end of WWII to research American broadcasting, but returned to the LSE to teach in his own right. His famous 1937 paper “The nature of the firm,” incidentally, has recently been revived in an attempt to understand the viability of open-source creativity.<sup>10</sup>

Coase’s *British Broadcasting: a study in monopoly* (1950) began with a homage to Plant, whose student Coase had been. Its axioms were, in fact, very close to those Plant had embraced in his own work on informational property. The book then retraced the history of the BBC’s founding and subsequent development in considerable detail, and assessed its responses to wired broadcasting and continental commercial stations with devastating skepticism. Coase was able to show that the monopoly had been established with minimal serious debate, and that in subsequent charter renewal processes too it had still not been subjected to fundamental questioning. Doubts about the idea of a monopoly were indeed expressed by those on the fringes of the process – politicians and others – in the early days, but such expressions had quietened down after the initial formation of the company. Where they had persevered, the corporation and the Post Office had only had to mention the alleged alternative of ether chaos to quell them. Nonetheless, Coase (like Plant) was able to restore to view a tradition of opposition to an information monopoly. In this case the tradition extended right back to 1922, when the British Broadcasting Company had been founded. It identified the new medium of wireless with the old one of print, and declared that freedom of expression must reign in the one as it did in the other. And it had never been answered. In the end, of course, Coase concurred with it himself.

Coase concluded with a damning summary of the purported arguments for monopoly that had in fact been presented. The major points were technical, financial, administrative, and cultural. The technical claim was the old one of the scarcity of available wavelengths. This allegedly made it imperative that some single authority choose the number, sites, power, and wavelengths of transmitters, in order to minimize interference and maximize coverage. Coase responded that while this was true enough given the premise, it did not mean that *programming* need be monopolized. After all, in the USA the FCC allocated wavelengths but did not operate a broadcasting service. The financial claim was that it would be difficult to fund rival stations unless by advertising, which all agreed was beyond the pale. This Coase simply denied; it was simple enough to envisage divisions of the licence fee, as the *Economist* had proved. Or else a station could be financed by some other public body, like a municipality or (as had happened frequently in America) a university. The third claim was that a single entity was simply more efficient, since it would not multiply costs such as royalty payments, and could achieve simultaneous broadcasting more easily. Coase pointed out that the American chains broadcast programs simultaneously with no apparent trouble, and contended that the efficiency claim was at best speculative. (In fact, he almost certainly thought it preposterous, given his views on the alleged efficiency gains of monopolies in general.)

So the technical arguments were incorrect, the financial claims unproven, and those based on efficiency inconclusive. That left the cultural argument. Coase concluded that, propaganda aside, this was the *real* reason for the monopoly. According to this argument, it was imperative that broadcasting exhibit a unified and coherent programming policy. The originator of this notion was John Reith, later Lord Reith, the first manager and continuing *eminence grise* of the corporation. Coase believed that it was Reith's personal determination that had sustained the idea of a coherent cultural identity (and therefore the monopoly itself) through its difficult early years. Reith had maintained that it was "essential ethically" to have a single entity, so as to have uniform cultural standards and fulfil what he saw as the corporation's paternalist, Christian, and imperial mission to drive improvements in popular taste. *This* was what had really underpinned the BBC's opposition to wire relays and continental commercial radio – they were no real threat to the corporation except insofar as they allowed listeners to evade its

standards and therefore eroded its moral mission. The integrity of the BBC's "balanced conception" of public service, expressed through its program "balance," was what was at stake in the quarrels with such rivals. And this position Coase found logically powerful but morally disastrous. Impartiality of the kind claimed by the corporation was, in his view, a clear impossibility for any organization to achieve. Moreover, with only one organization operating the bias would be hard to discern – and it would be all the more risky when that organization charged itself with *imposing* "standards" on its listeners. To support such a position required assuming that one authority could reliably distinguish good taste from bad objectively, and that it had the right to impose its judgments in order to change public standards. If accepted at face value, this argument would justify a unified press no less than a unified broadcaster. It tacitly invoked "a philosophy which we now call totalitarian."

It is at this most basic level that the alliance with Plant's arguments and the association between state planning and slippery slope to totalitarianism became evident. For Coase, the BBC's nature not only implied totalitarianism, but would also pose a threat to the very "springs of artistic activity." Why? He did not himself say, but surely the answer was that creativity was intrinsically protean, unpredictable, unplannable – all the convictions that Polanyi would invoke at much the same time, as outlined below.

But why, then, given that most British politicians and bureaucrats were not in fact totalitarians, was the monopoly sustained? Coase's answer appealed to what he called "institutional forces": the monopoly had lasted, he thought, because ending it appealed to no powerful interest. The Tories had launched the BBC as paternalist, but Labour endorsed it as collectivist and as the model of a Keynesian public corporation. The press supported it too, largely because it feared competition from commercial broadcasters. The Post Office, on which the Government relied for technical advice, had an internal tradition of monopolies in mail, telephony, and telegraphy, and extended this tradition into broadcasting. And finally, once created, the BBC itself had Reith to argue for it. Above all, for the public at large the monopoly reflected "the spirit of the age," which was in favor of central planning.<sup>11</sup> In that respect, it looked as though Keynes was right.

But after Coase's book was published there was a radical change. He found support from, among many others, Arnold Plant, who now published an attack on the BBC for claiming what he called "property in programmes." Plant repeated that ever-lengthening periods of copyright did nothing to stimulate better quality or more quantity in creative works, and deplored the quasi-monopolistic roles of the Performing Right Society and Phonographic Performances Ltd., which collected rights fees on a collective basis and negotiated so-called "needle time" with the BBC. Plant even began to warn of the stifling influence such monopolies could have on what he now labeled the "new commerce" of intellectual property. It was in this context that Plant, along with Coase and an increasing number of Tory MPs, advocated commercial television, and even paid programming.<sup>12</sup> In the mid-1950s, their arguments bore fruit, not in a reform of radio, but in the creation of commercial television – a new medium destined to be far more powerful and influential.

### *Michael Polanyi and the limits of liberalism*

Michael Polanyi was at first a chemist and later a philosopher of science. Born in Budapest (and brother to the economic historian Karl Polanyi), he worked in Haber's laboratory in Berlin in the 1920s, until he was forced to leave in 1933 with the ascent to power of the Nazis. He went to Manchester, where he continued his chemical researches, but where he also became increasingly interested in accounting for the nature, success, and authority of science. It is this work on what would today be called "science studies" that has proved more lastingly influential. It was first published immediately after WWII as *Science, Faith, and Society*, but the major work for which he is remembered is *Personal Knowledge: Towards a post-critical philosophy* (1958).

Polanyi, like the other figures considered here, was a participant in a major mid-century debate about the nature of knowledge and its creation, the focus of which was on two questions. In place of the much-debated "demarcation" issue that had dominated the 1920s (how do you tell science from non-science?), the late 1930s increasingly concentrated on more overtly political matters: (1) whether the nature of science did or

should include some commitment to the public good, and (2) whether the state had a legitimate role overseeing the enterprise of science towards a public good. In Britain, where Polanyi now found himself, leading proponents of the line that science *should* be directed to the good of the commonweal, and that the state should *plan* the outlines of major research programs to this end, included J.D. Bernal (1901-71), the molecular scientist, crystallographer, marxist, and pacifist. He was founder of the Cambridge Scientists' Anti War Group, which promoted anti-Fascist causes and anti-colonialism as well as broader pacifist issues in the 1930s. And he also drew inspiration to argue for the social function of science from meeting Nikolai Bukharin and Boris Hessen, who visited Britain in 1931 and spoke about the industrialization of the Soviet Union (both were to be executed later in the decade). First at Cambridge and then, from 1937, at Birkbeck in London, Bernal organized and defended arguments for science as a socially engaged and responsible activity, and for the scientist too as a figure responsible for what science created. He summed up his case in 1939 in *The Social Function of Science: What science does and what science could do*. The book analysed Nazi science in terms of the intrusion of the militaristic state into the scientific enterprise – a position akin to that of Robert Merton, who was inventing the sociology of science on much the same kind of concern in the United States. But where Merton wanted to twin science to the openness of liberal democracy (and his account of “communism” as one of the defining norms of science meant only that scientists laid no claim to personal ownership of discovered entities like universal gravitation), Bernal went further and argued that the natures of science and capitalism itself would eventually prove incompatible. What would replace it would have many of what he saw as the positive features of the early, hopeful Soviet revolution. Science would become the handmaid to society.

Bernal had powerful allies. They included several colleagues already eminent – J.B.S. Haldane, J.G. Crowther, L. Hogben, and others – and a number of more junior people who would later gain enormous distinction, such as Dorothy Hodgkin, Eric Hobsbawm, and Rosalind Franklin. Their views may seem to us to represent an extreme. But in a decade when *everything* in politics seemed extreme, these choices needed to be made. To Polanyi, however, and to his colleagues in the vocal neoliberal camp, such arguments seemed disastrous. These men perceived a historical trend through the

decades since 1914 of increasing state intervention in society, industry, and science too. At first voiced primarily by rather marginal figures (Hillaire Belloc, then Sir Ernest Benn), criticisms of this orthodoxy rested on the assertion that Keynesian intervention, nominally moderate and publicly beneficial, was the first stage on a slippery slope to the identification of the state with society – that is, to totalitarianism. This conviction came to a certain crisis point as the end of WWII approached. By 1944 it was clear that the Allies were going to win the war, and the question was arising with increasing urgency of what sort of society should be made by the victors. The widespread and deep conviction that the resources of modernity *should* be planned and managed for the public benefit was to be demonstrated in Britain by the huge victory of Clement Atlee’s Labour Party, committed as it was to nationalizing key industries and creating a socialized health service. As realization dawned that this “threat” was looming, so figures like Friedrich Hayek and Karl Popper entered the lists to counter it. The result was the appearance of Hayek’s *The Road to Serfdom* and Popper’s *Open Society and its Enemies*, both of which were meant expressly as warnings against the trend to totalitarianism that they saw in ambitions to have the state *plan* things like science. Another result was the formation, after Atlee’s victory, of the Mont Pèlerin Society, a discussion group dedicated to preserving and advancing the arguments of these neoliberals in what they perceived to be a hostile world. Popper and Hayek were founder-members. So was Polanyi.

Polanyi’s philosophy of science needs to be seen as of a piece with Hayek and Popper’s polemics. Against those who maintained that science proceeded (or should proceed) by specifiable methods – a position that Popper in fact held – Polanyi insisted that it was far more a matter of skills, which could not be exhaustively specified by rules. In practice, science proceeded by the inculcation of “tacit knowledge,” which is to say, by congeries of unspoken techniques, preferences, and even norms. It resembled a tradition far more than a rational system. For that reason, it was impossible *in principle* to plan research. In this, his endpoint, Polanyi agreed strongly with Popper. Research must be allowed to play out in a field of competition as open as possible, and no agency could ever hope to predict the winners in such a competition. Planning could only corrupt and inhibit the discovery and development of new knowledge. It led straight to Lysenkoism.<sup>13</sup>

Polanyi's argument was as much about *creativity* as about science itself. At its core was a notion of imaginative originality that extended beyond the laboratory, or of which the laboratory was but one instance. He was fond of referring to anthropologists' researches on very nonscientific forms of creativity, for example, to make his points about practical reasoning. He also likened science to medieval craft, which was organized into guilds for which one qualified as a master through apprenticeship.

In short, although Polanyi differed radically from Popper (and from virtually all other writers on science prior to Kuhn) in stressing the tradition-like, skilled, tacit, and, in fact, inherently conservative character of the creative enterprise that was science, he did agree that true science must operate as something like a liberal marketplace, characterized by "dynamic order." "The Liberal conception of... freedom is the only method by which we can continue to discover the regions of yet undisclosed truth." He had a strange view of modern economic processes, however, on which he based an analogy to the workings of authorship in creative fields: he believed that the publication record of major authors would correspond to the function of prices in a marketplace.<sup>14</sup> At any rate, he was as stridently opposed to Bernal's advocacy of science with a social purpose, which implied state intervention in the scientific enterprise, as Hayek, Mises, or Popper was to industry with a social purpose. Bernal, he wrote in *Personal knowledge*, had "surrendered," along with Sartre and Picasso, "to a philosophy which denied the very existence of their intellectual pursuits."<sup>15</sup> He founded a Society for Freedom in Science with similar aims within the sciences to those of Hayek's Mont Pèlerin Society in economics and politics.

This background makes a paper that Polanyi published in 1944 all the more remarkable. "Patent reform" appeared in the *Review of Economic Studies* that Autumn. It marked a sharp departure for Polanyi. He diverted himself from his campaign against planning to argue that the corruption of creativity produced by patents risked being *greater* than that produced by state intervention. The system could only be fixed by change so radical as to amount to its destruction. For a start, the unholy monopolies that patents were being used to uphold must be ended, by moving to a compulsory licence system (Plant's argument again, in essence). More than that, however, to supplant the

inequities of the existing regime while preserving the incentives for speculative investment in inventive activity that patenting presently supplied, there would need to be some alternative source of returns. For this, Polanyi advocated massive state subsidy. And finally, he proposed the creation of a trade judicial system, “courts” of technical experts and trade representatives to resolve IP issues on equitable grounds.<sup>16</sup> This extraordinary departure from his usual view of science and politics was justified on basic grounds: that the patents system seriously misrepresented the nature of creativity, and that his replacement, whatever its degree of government involvement, at least did not commit that mortal sin.

Polanyi began by conceding that monopolies had been widely accepted as justified in certain circumstances, and in particular for “pioneer” enterprises that could not yet survive commercially. But he insisted that they remained problematic even for these. There was (according to his view of creativity) no rational algorithm that could predict which discoveries or inventions would succeed, and hence no objective accounting of risk. That meant that there was *no such thing* as “commercially justified” investment in such pioneer ventures even with the patent system in place. In addition, no accounting was possible to decide whether the vast discrepancies in returns that backers experienced were equitable. And then there was the “grave difficulty” with patents that “the full benefit of knowledge is only reaped when its circulation is free.” Polanyi, as a good neoliberal, set great store by the conviction that monopolies of all kinds made society worse off, not least, in this case, by restricting further research. Not only that, but patent monopolies in the real world were applied with “striking irrationality and uncertainty.” Moreover, in recent years the harmful effects of patents had increased. They had been employed repeatedly to consolidate trade monopolies extending far beyond new inventions – glass manufacture in 1930s America being one example Polanyi cited, and shoemaking in the UK being another. “It cannot be doubted that patents are not infrequently being used to-day for the consolidation of the very kind of purely restrictive monopoly to which patents for inventions were originally meant to stand in definite contrast.”

In short, the existing system was riven with flaws. It enshrined inequitable rewards for inventors and backers. “Floods” of patents were issued, of dubious validity. Manufacturers could not tell if they were liable for a lawsuit, so the system fettered industry. Even valid patents could be so lengthily challenged as to ruin their owner (as happened with the radio pioneer DeForest). The system fostered millionaires’ justice. So why was it so bad? Because, Polanyi argued, it sought “a purpose which cannot be rationally achieved.” It tried “to parcel up a stream of creative thought into a series of distinct claims, each of which is to constitute the basis of a separately owned monopoly. But the growth of human knowledge cannot be divided up into such sharply circumscribed phases.” In reality, “invention and discovery” drew on “the whole network of human knowledge.” The law misrepresented these processes. And its criteria of novelty, utility, and invention were similarly simplistic.

Yet, for all this, Polanyi acknowledged that a broad consensus existed, and had since “the very earliest days of the Free Trade movement” (which in his version meant c.1600), that for industrial creativity, at least, the patent system was warranted. Without patents, it was assumed that industrial research would lose the stimulus and guidance of market profitability. Speculative capital would dry up. Individual inventors would be left at the mercy of rapacious corporations, and could never afford to seek backing for fear of seeing their creations expropriated. And above all, without the disclosure conventions central to patents the culture of further research would be destroyed. Such declarations were essential to creative work, Polanyi insisted, as could be demonstrated by the relative stagnation of fields (like brewing and distilling) in which craft secrecy still prevailed.

So what was needed was radical reform. Polanyi proposed to replace much of the existing structure of patent law with what he called “a system of appropriate governmental action” [a clause after which I have never been as tempted to write *sic*]. Given “the nature of knowledge,” full publicity and free application by anyone was the optimum. Any proprietorship was “both irrational and open to grave abuses.” Given this, Polanyi had a proposal. *“In order that inventions may be used freely by all, we must relieve inventors of the necessity of earning their rewards commercially and must grant*

*them instead the right to be rewarded from the public purse.*” But would this not be unfair to taxpayers? Polanyi thought not. Over a generation or so, the benefits of new inventions accrued to all, and therefore “no great injustice would be committed against anyone if the rewards of inventors and their financiers were charged collectively to the public.” Would it not have the disadvantages of all other government intervention? Again, Polanyi argued that it would not: the commercial function being undertaken was a narrow one, already imperfectly performed, so the target to do better was not difficult to hit. Furthermore, he insisted that his proposal carried no implication of accepting “the feasibility of a ‘planned economy’,” since it did not involve government allocating resources between various productive institutions.

Putting all this into practical operation, however, would involve degrees of state control and coercion that to modern (Chicago) eyes seem drastic. Initially, the way to proceed would be to convert all patents into licences of right – i.e., to vastly expand compulsory licensing. For the most part this could be done voluntarily, with incentives from the incoming reward system. But patents suspected of being used to fence monopolies rather than to protect inventions per se would have to be converted compulsorily, with no right of complaint. “This would practically amount to the abolition of patents,” Polanyi noted, but at the same time society would implement a government-directed reward to patentees in order to keep encouraging inventors and their backers. Polanyi estimated (it is not clear on what basis) that a reward of 10-30% of the appraised economic benefit of a given invention for the prior year would be enough. Given the spur to innovation created by the new system, he reckoned that society could easily afford the   % of national income this would cost in the UK, or the 1% in the USA.

But how to calculate these benefits? “In order to avoid the danger of corruption and arbitrary oppression which is never far removed from the grant of Government subsidies,” Polanyi insisted, the protocol of appraisal should be “rigid.” But in many cases it could be carried out solely by government agents. It would be a kind of perfect bureaucratic oversight of the field of industrial creativity. He forecast that this system “would efface the last vestige of control which a patentee could exercise over his competitors and eliminate at the same time any serious interest on the part of the latter to

infringe patents by an unlicensed use of the protected invention.” That is, monopoly and piracy would be eradicated at a stroke.

Furthermore, Polanyi’s scheme would also obviate the greater flaws involved in millionaires’ justice by creating a *graded* system of attributions, where authorship was no longer seen as absolute and indivisible. He proposed the creation of an institution – a “panel, or court, of technical experts and trade representatives” – to allocate these graded levels of responsibility and authorship. This would truly be a judicial affair, guided by principles of equity. For example, if a given advance had arisen by cumulative minor changes each too small for a patent, such a court would be empowered to assign rewards equitably to those meriting them.

In sum, this was an astoundingly interventionist, top-down, technocratic, and, frankly, illiberal system for an otherwise outstanding liberal to propose. It has no counterpart that I know of throughout Polanyi’s other writings. That Polanyi proposed it, apparently in all seriousness, reflects a number of things worth remembering. First is the intensity of debate on creative properties and their public implications in the 1930s – something that has been all but completely forgotten as modern polemicists reinvent successive wheels. Second is the connection of that debate with the debate about science and the public good. Third is Polanyi’s own philosophy of originality/creativity itself, which stressed its irreducibility to rules and its incommensurability with attempts at planning. And fourth is the internal neoliberal tension over monopolies and public ownership, centering on the following question: given that both monopolies and intervention were always bad, was intervention ever called for to undermine monopolies, and in what circumstances? This last loomed just as large for Polanyi in the sciences as it did for Plant and Coase in publishing and the media – or, more famously, for Hayek in economics.

*Norbert Wiener on the care and feeding of ideas*

My last example, Norbert Wiener, stands apart from the other three. Unlike them, his major stalking ground was the United States, and although he was obviously aware of and engaged in the struggle against totalitarianism, he was not an émigré or an ideologue. He is known today primarily as the inventor of the notion of *cybernetics*, the science of control in humans and machines. He is further renowned as one of the architects of “information culture” – as one of the people who made it possible to conceive of “information” as a discrete entity in terms of which societies could be analysed and economies developed.

Wiener (1894-1964) was by his own profession a prodigy, receiving a PhD from Harvard at the age of 19. He worked after that achievement in various American and European universities (Cornell, Columbia, Cambridge, Gottingen, and Copenhagen) before settling at MIT. During WWII he worked on technical problems to do with the aiming systems of anti-aircraft guns, and this experience was one that helped lead him to his argument for the importance of control and communication in general. He came to argue for the generality of this perspective, maintaining that the science of control and communication was grounded in a general need to combat the entropy law of thermodynamics. He sought the key to this science in feedback mechanisms, described in complex statistical formulae. The result was a sometimes highly technical science christened *Cybernetics* in his book of that name in 1948. Its central pillar was a theory of communication devoted to distinguishing “signal” from “noise” in networks, which would later become central to all modern telecoms. After that, Wiener devoted himself largely to diversifying the influence of this notion that made “the theory of messages” central to accounts of living and nonliving nature alike. His work, along with that of interlocutors like Claude Shannon and Warren Weaver, is commonly identified as foundational to the very possibility of an information age.

Yet Wiener did not, in the end, pursue this work as far as he wanted to. The reason was that he became convinced that the true scope and impact of information were being obstructed by protocols of intellectual ownership. In part this rested on personal experience: in the 1930s he and Y.W. Lee, an ex-student, patented a network design, and sold the patent to Bell, only to see the company fail to develop the invention and also

prevent others from using it for the patent's 17-year term. He also lodged a speculative proposal for a digital computer with the war authorities in the 1940s, only to see it too neglected. But it was also a perspective of principle, that IP conventions impeded the development and flow of information in the great network that was modern society. In other words, IP was a massive ally of entropy and a massive enemy of information in Wiener's technical sense of the term.

For years Wiener sought to publicize this conviction. One result was a book entitled *Invention: the care and feeding of ideas*. It was commissioned as a study of the philosophy of invention. Written largely in 1954, the work in fact deals with the history of invention. It uses that history to mount an argument for the relative importance of individuals and "environment" in creativity. Wiener's case is that innovation comes from the ease of interaction between scholars and craftsmen, and that this is conditioned by society, so that prior to the Renaissance (for example) Asian cultures were more successful than European because they facilitated deeper exchanges of this kind. Yet he also maintained – and in the end this was the point that he made more forcefully – that it had to be individuals who capitalized on this environment. His volume became an extended defence of the lone, Romantic inventor against three modern enemies: the McCarthyite enforcement of political orthodoxy; the increasing corporatization of invention since Edison's invention of the industrial research laboratory; and above all the iniquities of intellectual property law. They culminated together in the unholy phenomenon of "megabuck science."

Megabuck science, Wiener felt, transcended political ideology and geographical location. It was the activity of research carried out in the manner of a factory, *planned* (here he resembled Polanyi) by managers and restricted in its scope to particular prescribed tasks. The problem with it was that it created channels of communication that either kept possibilities secret or – which was almost as bad – subdivided them into discrete problems that would be addressed by separate groups of researchers. In other words, big science killed invention because it was not in accord with Wiener's own science of information. Information was more process than substance, he insisted. It flowed through a network rather than accumulating in some kind of static reservoir. To

assume otherwise was the basic fallacy involved in both the state's creation of major research laboratories to hoard secret knowledge and the corporation's parallel development of laboratories to pursue planned research resulting in patents. The patent system was thus a kind of "jamming" in "the channels of communication essential to the welfare of society."<sup>17</sup>

Practically, the system had created a forest of competing claims. While paying lip service to the individual inventor, it had reduced him to a figurehead for corporate interests capable of paying for the legal expertise to negotiate that forest. And, perhaps above all, it subjected judgments about the creative process to judges unacquainted with what that process truly was like.

*Invention* never in fact appeared in Wiener's own lifetime, and was only rediscovered and published relatively recently. That Wiener laid it aside is, paradoxically, an indication of the importance he attached to this argument about IP and the corruption of science. He abandoned it in order to write, of all things, a novel about patenting. The novel *was* published, and is called *The Tempter*. It is a fictionalized account of the travails of a cursed English electrical engineer named Oliver Heaviside, a contemporary of James Clerk Maxwell (and in fact the inventor of what we now think of as Maxwell's equations). Heaviside in Wiener's view represented the truly noble inventor whose ideas were appropriated by the soulless denizens of industrial research. Wiener told his editor that "the story is really a treatment in fictional form of my ideas on invention in the modern world."

Heaviside's story was one that had captured Wiener's attention much earlier. In 1941 he had even tried to persuade Orson Welles to make a film based on it. That never came about, but in *Invention* he devoted several sections to his own outraged telling of the tale. According to Wiener, what happened was this. Heaviside was one of a number of mathematical engineers at the close of the nineteenth century working on a problem of signal distortion in long telegraphy cables that was crucial to their use in major communication systems. A loner, who, as Wiener put it, "was born poor, lived poor, and died poor," Heaviside lived outside the world of elite academia and industry. In Wiener's

eye this made him “sincere, courageous, and incorruptible.” He stole time on a Post Office line to test his heterodox theories of inductance, on which the distortionless lines necessary for telephony might be based. He published the results in a book that initially sold poorly, but then was “pirated” three times (once in China) and in this form became an essential foundation to twentieth-century communications science. Heaviside himself never sought to patent his notions, and the fundamental work was old enough by the time that its significance was widely acknowledged that no patent could have been lodged. So AT&T sought a way to modify the work to claim a new right. It recruited Michael Pupin, a Columbia engineer, who as an outsider to the company would have credibility. Pupin furnished a qualification to Heaviside’s work, essentially making explicit elements implicit in Heaviside’s original papers. He patented this, effectively gaining the right to implement Heaviside’s insights. The company then paid him \$500,000 for the right. It did try to pacify Heaviside, but he declined all offers that did not recognize his sole credit as author of the inventions – the one thing the company could not yield without abandoning its investment. He died in noble poverty. Pupin himself, meanwhile, issued a series of more self-aggrandizing accounts of his role as heroic discoverer, culminating in a popular work entitled *From immigrant to inventor*. Wiener read this book, which enjoyed a great vogue among American adolescents, not as an inspirational success story, but as a massive exercise in assuaging guilt. “For those who read between the lines,” he concluded, “*From immigrant to inventor* is not a typical American success story, but a cry from Hell.”<sup>18</sup> *The Tempter* took this argument and made it into a fiction. It was a novel that, in Wiener’s words, “joined the story of Prometheus with the story of Marlowe’s Dr. Faustus.”<sup>19</sup> And it was the patent system that provided the mechanism for Faustus’s temptation and downfall.

### *Consequences and speculations*

Since this is a workshop in cultural policy, it seems appropriate for me to slough off the historian’s usual caution and speculate about the consequences of all these arguments – and also about how they may be used today. There follow five possible “talking points.”

1. These commentators were all liable to look sympathetically (to varying extents) on real challenges to information monopolies. Think, for example, of Wiener on that Chinese piracy of Heaviside, or Plant on the bootleg clothiers. The most publicly consequential such challenge in the mid-twentieth century was that of pirate broadcasting. (Pirate publishing, pirate recording, etc., all existed, but were not of such obvious political concern.) From the earliest days of broadcasting, issues of interference and transnational influence, as well as of commercial viability and cultural quality, have made the regulation of transmission a vexed issue. In the 1960s the activity of so-called pirate radio became a major political football, especially in Britain. As is well known, pop music owes much to the development of laissez-faire stations generally based on ships anchored outside territorial waters and broadcasting into London in competition with the BBC. The pirates challenged every aspect of the European broadcasting system head-on. In the UK one of their biggest backers was a one-time Mont Pèlerin member named Charles Smedley, who had been a major figure in the Liberal Party and a prolific author in the Hayekian camp. Smedley was one of two founders (with Anthony Fisher) of the Institute of Economic Affairs – the prototype “think tank” for policy studies, and the incubator of Thatcherism in the sixties. The IEA published a series of papers in defense of pirate radio and attacking intellectual-property law on explicitly Plantian lines. In the end, the broadcasting system in the UK was effectively revolutionized as a result. The trigger, however (to call it that advisedly) was a more dramatic kind of intervention: in June 1966 Smedley shot dead a rival pirate radio manager, in an incident that attracted national headlines and forced the Government to take action. Within a year the pirates had been shut down, and their originality co-opted by the BBC – which, in reforming itself to imitate their programming, became what one DJ called “the biggest pirate of them all.”

What I want to stress from this is that “piracy” (in all its senses: challenges to monopoly as well as violations of copyright, patent, or trademark law) may be what the IEA explicitly called “a business force.” The IEA averred that *all* truly radical business models are initially called piratical. How plausible is this? If it does have any plausibility, how do we tell positive piracy (the kind that may give rise to a new orthodoxy in the future) from mere recidivism? Perhaps more important, *who* should do

the telling? Certainly, the music industry would not be what it now is but for the sixties pirates (and also a new wave of pirates in the eighties, who launched the acid, house, etc., movements). If we really think that laws of information monopoly are open to challenge, and that the challenges may bring benefits, then what do we think about piracy?

Certainly, the RIAA and FCC polemics against pirate media on grounds of parasitism are simply false (although there may be other grounds for closing unlicensed stations down, such as the incitement of violence).

2. Our arguments are less new than we suppose. If we think “information wants to be free,” then that is a sentiment which (if not worded in exactly the same way) was widely endorsed by these critics. Is there, then, a route by which the arguments of midcentury have descended to inform those of today? If so, it is not an evident or straightforward one. That much is clear from the sheer political disjuncture involved: it means moving from the libertarian right in the 1940s to the skeptical left today. Yet there are indeed traces that seem to indicate an inheritance, and not just in sustained arguments like that of Benkler in “Coase’s Penguin.” Perhaps the lack of a single route itself has a message. I.e., the claim that information wants to be free is one that has itself moved freely. But if this is so, why is it so starkly absent from the communities that set greatest store by being the lineal descendents of Coase, Plant, and Hayek – namely, the economic liberals entrusted with structuring globalization at the WTO and WIPO? (On the other hand, I have been told more than once by computer programmers that open-source is “communism,” which in the light of these sources seems another interestingly misconceived genealogy.)

3. Richard Epstein last time advanced a systematic argument for the particularist nature of intellectual property and of the moral issues it engenders. I think these arguments support that position – although I don’t think that these writers as individuals would have agreed. I.e., empirically, there is no one thing to which we can properly or usefully attach the label “intellectual property.” The issues on which debates continue to rage are in fact not aspects of one essential contradiction demanding of one systematic solution, but discrete practical problems. E.g., the issue of the *length* of copyright term does not need to be linked to that of the *strength* of copyright protection.

One may be a skeptic about the one and a hard-nosed policeman on the other. Here, however, the systematic argument for particularity is based not on liberty as such, but on the primacy of avoiding monopolies in information (although my understanding is that in neoliberal thought these were closely linked matters). That too seems to me a good basis for beginning the argument – and it leads immediately to the obvious recognition that *any* set of solutions, short of the absolute boundary states (total property or none), must be conventional and forged by compromise. It is not doctrinal. It is subject to a calculus of costs and benefits.

4. We are always perforce historians when we talk about IP. That is, we're not just dealing in terms of principle, but of empirical observation. If we want to know that the range of options may be in IP policy, and what the consequences of different choices, our field of investigation is going to be largely historical. So, here, Plant and Coase both restored to view traditions of dissent against information monopolies. Wiener complained at length about Heaviside's treatment, but also went back far further to talk about traditions of invention in, for example, ancient China. Polanyi did much work on the development of practical traditions within the sciences. This is not just trawling for precedents. Doing history like this is intrinsically hard to reconcile with being an absolutist or universalist. It is notable, on the other hand, that most writing now that does take principled positions on either side tends to be innocent of historical empiricism. We tend to get a sketchy acknowledgement that there has been change over time, with the compulsory reference to *Donaldson vs. Becket* or the Monopolies Act, but no sense of real, consequential arguments having occurred that could have gone either way (and in the case of *Donaldson vs. Beckett*, apparently *did* go the other way, only to be misrecorded in the House of Lords). Above all, there is no sense of culture as practice in such work. We need to recover the Polanyian emphasis on the tacit, unwritten, aspects of business life as well as scientific.

5. We are often told that the central problem with IP law is its basis in Romantic conceptions of authorship. Like Wiener's text, patent and copyright are founded on an assumption of individual "shop-inventors" who create and whose creations need to be reserved to them in order (a) to reward them, (b) to provide a rationale for

investment to make their ideas beneficial, and (c) to furnish an incentive for future innovation. Martha Woodmansee, who is coming to this workshop in a couple of weeks, is widely associated with this kind of argument. I do not want to presume anything about what she may say when she comes. Yet, as indicated above, I tend to think that any such single principle, if present, is buried rather deeply in the culture of IP and there may be more point to arguments that are more local in scope. Still, however, if there *is* such an intellectual keystone, it seems worth suggesting that the notion of compulsory licensing, advanced by Plant so forcefully, may provide something of a solution to the problem associated with it. The whole point about compulsory licensing, or “license of right” – which is still used in the pharmaceutical industry and in the entertainment business – is that after a relatively short time the author does *not* have a monopoly. It separates authorship, which is legally recognized, from monopoly, which after a reasonable period is not. It therefore counters fairly directly the major complaint of modern critics.

There is something else important to be said for compulsory licensing, and it is this. One of Wiener’s biggest complaints about patent law was not so much a matter of principle or doctrine as one of personnel. That is, he complained that the technicality of patent law was already so great that decisions about inventive credit were being taken solely by lawyers. Lawyers were experts in law, not in invention, so they often got these decisions hopelessly wrong. He wanted instead to see panels of technical experts decide such issues – a view that is scarcely less remarkable in Wiener, who was generally skeptical of the pretensions of experts to set social policy, than it was in Polanyi. Again, this kind of “let’s-kill-all-the-lawyers” pronouncement is fairly widespread in the anti-IP camp today. Compulsory licensing reduces this problem of personnel at least a little, in that under such a system the terms and rates of licensing are determined not in individual court cases but by public representatives, presumably in Congress. In other words, the key decisions about the scope, extent, and strength, and benefits of IP would be taken by a community that is at least in some sense publicly answerable. It is not much, as the Sonny Bono Act demonstrates. But still, it is something. We need it to happen.

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<sup>1</sup> Plant, “Economic aspects,” 62.

<sup>2</sup> Sir Arnold Plant, “The economic aspects of copyright in books” (1934), repr. in Plant, *Selected Economic essays and addresses* (London: RKP for the Institute of Economic Affairs, 1974), 57-86.

<sup>3</sup> A. Plant, “The economic theory concerning patents for invention” (1934), *Selected economic essays and addresses*, 35-55.

<sup>4</sup> J.M. Keynes, *The end of laissez-faire* (London: Hogarth Press, 1926), 41-2.

<sup>5</sup> E.J.P. Benn, *Modern Government ‘as a busybody in other men’s matters’* (New York: D. Appleton Co., 1936), 55, 63-5; Benn, *The BBC monopoly* (London: Society of Individualists, 1941; repr. 1944).

<sup>6</sup> R.S. Lambert, *Ariel and all his quality: an impression of the BBC from within* (London: Victor Gollancz, 1940), 238, 307-8, 315-7; P.P. Eckersley, *The power behind the microphone* (London: Jonathan Cape, 1941), 14-15, 195-208, 253-5; P. Bloomfield, *B.B.C.* (London: Eyre and Spottiswood, 1941), 148-9, 248-50; *The Times* 26 June, 1946.

<sup>7</sup> *The round table* 36 (1945-6), 323-9

<sup>8</sup> *The Economist* 4 November 1944, 597-8; November 11, 1944, 630-31; 5 January 1946, 8; 29 June 1946, 1036.

<sup>9</sup> *The economist* xxxx.

<sup>10</sup> Y. Benkler, “Coase’s Penguin, or, Linux and *The nature of the firm*,” *Yale Law journal* 4:3 (2002).

<sup>11</sup> R.H. Coase, *British broadcasting: a study in monopoly* (Cambridge, MA: Harvard University Press, 1950), passim, esp. 179-96.

<sup>12</sup> Wilson, *Pressure group*, 169; A. Plant, “Property in programmes,” *BBC Quarterly* 6 (Spring 1951), 18-24; Plant, “The new commerce in ideas and intellectual property” (1953), *Selected economic essays and addresses*, 87-116.

<sup>13</sup> M. Polanyi, “The growth of thought in society,” *Economica* November 1941, 428-56.

<sup>14</sup> See S. Fuller, *Thomas Kuhn: A philosophical history for our times* (Chicago, 200), 145; M. Polanyi, “The Republic of Science,” *Minerva* 1 (1962), 54-73.

<sup>15</sup> Polanyi, *Personal Knowledge*, 237; “Growth of thought,” 448.

<sup>16</sup> M. Polanyi, “Patent reform,” *Review of Economic Studies* 11 (1944), 61-76.

<sup>17</sup> N. Wiener, *The human use of human beings* (Boston: Houghton Mifflin, 1954), 128, 131.

<sup>18</sup> N. Wiener, *Invention: the care and feeding of ideas* (Cambridge, Mass.: MIT Press, 1993), esp. 68-76, 133.

<sup>19</sup> N. Wiener, *The Tempter* (NY: Random House, 1959).