

## Hayek, Friedrich August von (1899–1992)

This article reviews the major intellectual contributions of the Austrian-born Nobel laureate Friedrich Hayek. Within economics, Hayek made contributions to many areas, among them monetary theory, trade cycle theory, and capital theory. His ‘knowledge-based’ critique of socialism and subsequent work on ‘the knowledge problem’ are widely viewed as seminal contributions to economics. Hayek also did substantial work in such fields as political theory, the methodology of the social sciences, psychology and intellectual history. Finally, his writings on spontaneous orders and his ‘theory of complex phenomena’ anticipated later developments in such areas as complexity theory and agent-based modelling.

Born on 8 May 1899, the polymath economist and social theorist Friedrich August von Hayek had the good fortune to be repeatedly in the right place at the right time, crossing paths with some of the century’s most brilliant economists and thinkers. He grew up in *fin de siècle* Vienna, a place and time of extraordinary intellectual vitality. Through his maternal grandfather, Franz von Juraschek, a professor of civil law and civil servant, he gained an introduction to the academic world in Vienna, and through his father, August, a medical doctor and devoted botanist, a love of biology and the sciences as well as an acquaintance with another extended community of scholars. As a student at the University of Vienna his major professor was Friedrich von Wieser, and among his classmates were Oskar Morgenstern, Gottfried Haberler, and Fritz Machlup. After finishing his studies Hayek spent 15 months in the United States where, armed with letters of introduction from Joseph Schumpeter, he encountered most of the major American economists, both those contributing to the Marginalist School as well as the leading institutionalist and business cycle analyst Wesley Clair Mitchell. When he returned he joined the *Miseskreis*, Ludwig von Mises’s study circle.

In the later 1920s he published an article in German that was read by Lionel Robbins, a newly appointed professor at the London School of Economics (LSE). This led to an invitation to present some lectures, and ultimately, in 1932, to Hayek being appointed to the Tooke Chair of Economic Science and Statistics. While at the LSE Hayek would engage in debates on the leading issues in economics with some of the discipline’s most important members: John Maynard Keynes and Piero Sraffa over monetary theory, Frank Knight and Nicholas Kaldor over capital theory, Oskar Lange and Evan Durbin over socialism. He was also instrumental in bringing the philosopher of science Karl Popper to the LSE.

Hayek remained at the LSE until 1950, when he moved to the Committee on Social Thought at the University of Chicago. There he counted among his colleagues Milton Friedman, Aaron Director, and George Stigler. Retiring in 1962, Hayek had successive appointments at the University of Freiburg and the University of Salzburg, returning again to Freiburg in 1977. In 1974 he was awarded, with Gunnar Myrdal, the Bank of Sweden Nobel Prize in Economic Sciences, and in 1991 the Presidential Medal of Freedom. Hayek died in Freiburg on 23 March 1992.

If Hayek was in the right place at the right time, it was usually with the wrong ideas, at least from the perspective of most of his contemporaries. He was a sharp critic of Keynes well before the onset of the Keynesian Revolution. Though he helped introduce English-speaking economists to general equilibrium theory, he claimed that a preoccupation with static equilibrium analysis would mislead economists about the true nature of a dynamic mar-

ket process. He attacked socialism when most members of the intelligentsia viewed it as a preferred middle way between an apparently failed capitalist system and totalitarianisms of the communist and fascist varieties; for Hayek such thinking was ‘the muddle of the middle’. When most Western democracies were embracing some form of the welfare state, he criticized the concept of social justice that provided its philosophical foundations. While most of the social sciences were moving towards more and more specialized studies, his work was increasingly integrative and multidisciplinary. The views Hayek embraced over most of his career were almost systematically out of step.

From the perspective of the early 21st century, history would judge Hayek’s legacy more kindly than did many of his contemporaries. He lived to witness the collapse of the Soviet bloc, which many took as vindication of his and Ludwig von Mises’s early critique of central planning. His view that a competitive market system with freely adjusting prices is an essential mechanism for coordinating social action in a world of dispersed knowledge is taken by economists as a fundamental insight. His insistence that markets be embedded in a host of other social and political institutions for their proper functioning provides a jumping off point for such diverse movements within economics as experimental investigations of market institutions, public choice and constitutional analysis, and the new institutional economics. Philosophers of mind, evolutionary biologists, and neuroscientists have been attracted to his ‘connectionist’ approach for understanding the development and functioning of the brain. His theory of complex phenomena and work on spontaneous orders has clear analogues in complexity theory and agent-based computational modelling (Caldwell, 2004, ch. 14). If Hayek remains a controversial figure in some quarters, even his critics acknowledge the breadth and depth of his contributions. One pundit, writing in the *New Yorker* in 2000, even went so far as to call the 20th century ‘the Hayek century’ (Cassidy, 2000, p. 45). Considering that this was only about two decades after the British Labour politician Michael Foot had referred to him as a ‘mad professor’, the reputational turnabout has been substantial.

### Early work

Hayek’s first trip to the United States took place in 1923–24. While there he studied new work on monetary policy and the control of the business cycle; he also witnessed the policy experiments being undertaken under the auspices of the then only recently established Federal Reserve System. Hayek subsequently wrote a paper on US monetary policy in which he criticized the goal of stabilizing the general price level (Hayek, 1926). According to the Austrian theory of the cycle, relative price movements play an essential role in the unfolding of the cycle, so that any policy prescription that focused solely on aggregates was judged deficient for ignoring such movements.

Hayek spelled out the Austrian approach in more detail in his first book, published in 1929, an English translation of which appeared in 1933 as *Monetary Theory and the Trade Cycle*. There he argued for a monetary approach to the origins of the cycle. Hayek claimed, first, and contra both the American institutionalists and German historical economists, that any adequate explanation of the cycle must be *theoretical*, and, further, that it must be consistent with, and presuppose the validity of, the standard equilibrium theory of the day. This poses a problem, however, for if one accepts the results of standard equilibrium theory, where prices adjust to clear markets, a question immediately arises: how can a disproportionality between

the production of capital goods and consumer goods that occurs during the boom phase of the cycle occur? For Hayek, money provided the answer. Though the use of money confers substantial benefits, most evidently to facilitate trade, and thereby to encourage specialization and growth, it is also a ‘loose joint’ in the system of exchange: ‘Money being a commodity which, unlike all others, is incapable of finally satisfying demand, its introduction does away with the rigid interdependence and self-sufficiency of the ‘closed’ system of equilibrium’ (Hayek, 1933, p. 44).

Another significant piece in this period was Hayek’s paper ‘Intertemporal Price Equilibrium and Movements in the Value of Money’ (Hayek, 1928), which is widely acknowledged as an early important contribution to the theory of intertemporal equilibrium.

### Hayek comes to the LSE

Hayek’s lectures in early 1931 at the LSE were published as *Prices and Production*, a book in which he completed the task begun in *Monetary Theory and the Trade Cycle* by tracing out the effects of monetary disturbances on the economy. Using a framework developed by Knut Wicksell (1906) and further adapted by Ludwig von Mises (1924), Hayek posited a *natural rate of interest* that, in the absence of monetary factors, would just equalize the demand for capital and the supply of savings. When households save, they forgo present for future consumption. The funds are borrowed by firms for investment in more ‘roundabout’ methods of production which allow firms to produce more goods in the future, thereby satisfying the desires of consumers. The natural rate of interest, then, is a relative price that coordinates a community’s preferences regarding present and future consumption with the production processes that create the goods.

However, in the crisis stage of the cycle, an excess of capital goods (relative to consumers’ preferences) are created. This occurs because of a divergence between *the natural* and *the market rate of interest*, caused by bank lending activity. Specifically, a lowering of the market rate of interest below the natural rate leads firms to move to more roundabout methods of production, just as they would have done had there been a reduction in the natural rate. However, in this case, because there has been no change in consumers’ preferences, the lengthening of production processes is not sustainable. At some point before the completion of the transition, prices for consumer goods begin to rise, which signals to firms that they have made errors. As they begin to abandon the more roundabout methods, a cyclical downturn is initiated.

Hayek’s theory carried the unfortunate policy implication that there was little that policymakers could do once an economy was in a recession. Recessions were avoidable only if one could make money ‘neutral’ by keeping the natural rate equal to the market rate of interest. Unfortunately, no one knows what the natural rate is; only the market rate is observable. The downturn, painful as it is, is actually the system returning to equilibrium, correcting for past errors. As such, policies that attempt to address a recession by injecting money only further encourage firms to persist in their mistaken behaviours, making the ultimate downturn even more severe.

Hayek’s book had a tumultuous reception. In late 1930 John Maynard Keynes published his own analysis of the problems of a monetary economy, *A Treatise on Money* (Keynes, 1930), in which he also used the Wicksellian framework. Hayek’s critical review of Keynes’s book drew a heated response from Keynes, who also took Hayek’s *Prices and Production* to task, noting famously that ‘It is an extraordinary example of how, starting with a mis-

take, a remorseless logician can end up in bedlam' (Keynes, 1931, p. 154). For a while, as John Hicks later recounted, the burning question of the day for economists was, 'Which was right, Keynes or Hayek?' (Hicks, 1967, p. 203).

Others entered the fray, and the weight of the combined criticisms ultimately led both Keynes and Hayek to revise their theories. Keynes finished first, publishing *The General Theory of Employment, Interest and Money* in 1936. Hayek's initial plan was to construct a dynamic theory of a capital-using monetary economy. He worked on the book in starts and stops for the rest of the decade, finally publishing it as *The Pure Theory of Capital* in 1941. There Hayek abandoned the simplifying Böhm-Bawerkian notion of an 'average period of production', and in its place systematically explored a variety of possible relations between inputs (both those available at a given point in time and over a continuous period) and outputs (whose availability might likewise vary over time). He examined the effects of substitutability and complementarity, of the introduction of new 'inventions', both in cases in which they are foreseen and when they are not, and of whether decisions are made by a single individual or within a competitive system. A key theme of the book is that the capital structure is constantly evolving as the market continually provides new information. In that evolution, capital is rarely either so malleable as to be instantaneously transformable, or so permanent as to be incapable of being applied in a different production process.

Hayek's book made important advances in capital theory, but he never was able to accomplish his larger goal. After seven years of labour he could only provide in the closing three chapters of the book a sketch of how to integrate his capital theory into a monetary framework. As he later once put it, once you get beyond Böhm-Bawerk's simplifying assumption of an average period of production, 'things become so damn complicated it's almost impossible to follow it' (Hayek, 1994, p. 141). Meanwhile Keynes's victory in the area of macroeconomics quickly became complete.

### *Socialist calculation and the knowledge problem*

In the 1920s, the British economy went through wrenching structural adjustments, and with the depression of the 1930s many among the intelligentsia came to view socialist planning as the only acceptable alternative system. Economists, some of them colleagues of Hayek's at the LSE, began issuing proposals for how to organize such a system. In 1935, Hayek entered the discussion with the publication of *Collectivist Economic Planning*, a collection of translations of essays from an earlier debate that had been initiated by Ludwig von Mises. Hayek included his mentor's essay, in which Mises argued that rational planning was 'impossible' under socialism. His point was that a monetary economy with freely adjusting market prices reveals relative scarcities among factors of production. When the means of production are state-owned, there are no prices for factors of production, and hence no signals to help socialist managers allocate resources rationally (Mises, 1920).

Some socialists (for example, Dickinson, 1933) responded by invoking Paretian general equilibrium theory, which they argued disproved Mises's thesis. They noted that any economic system could be represented by a system of equations, so that the only difference between a planned and a free market system lay in who was responsible for 'solving' the equations, socialist managers or private entrepreneurs. If some of the prices that the socialist managers chose were wrong, gluts or shortages would appear, sig-

nalling them to adjust the prices up or down, just as in a free market. Through such a trial and error procedure, a socialist economy could mimic the efficiency of a competitive free market system, while avoiding its many problems: wasteful competition, the market failures that attend monopoly and externalities, and an unjust income distribution (Lange, 1938).

Hayek challenged this vision in a series of contributions (Hayek, 1937; 1945; 1968) to what has since come to be called ‘the knowledge problem’. In ‘Economics and Knowledge’ (1937) he pointed out that the standard equilibrium theory of his day assumed that all agents have full and correct information. In the real world, however, different individuals have different bits of knowledge, and furthermore, some of what they believe is wrong. In that world, the key question is how it comes about that the actions of individuals ever get coordinated, a question that equilibrium analysis with its full information assumption brushes aside.

Hayek posited the market as a key coordinating institution. He described the market process as operating in a world of constant change, in which freely adjusting prices are formed as the result of decisions, typically forward-looking, of literally millions of market participants. Their decisions are based in part on the vast array of prices that they confront in the market, prices that give them information about relative scarcities. But in addition, agents act on the basis of localized knowledge, knowledge of particular circumstances of time and place, some of which is tacit – that is, they cannot say why they are acting on it. Their market activity also reflects this localized knowledge, and by acting their knowledge becomes embedded in the array of market prices. In short, market activity is both price-determined (prices shape what people do) and price-determining (what people do, based on local knowledge, determines what prices are). Market prices coordinate the specific knowledge of time and place possessed by millions of market agents. Socialist schemes that involve price fixing, as many of the proposals did, would keep the communication system from working. Hayek also doubted that trial and error price adjustment methods could ever mimic the speed of adjustment produced by markets, where errors to be corrected are simultaneously profit opportunities for alert entrepreneurs. Finally, Hayek criticized the profession’s focus on standard equilibrium analysis which, by concentrating on equilibrium states, obscures the competitive process by which knowledge about relative scarcities becomes known: that theory ‘starts from the assumption of a “given” supply of scarce goods. But which goods are scarce goods, or which things are goods, and how scarce or valuable they are – these are precisely the things that competition has to discover’ (Hayek, 1968, p. 181). In short, market competition provides a discovery procedure. Hayek developed these ideas in a series of papers, the most famous which, ‘The Use of Knowledge in Society’, is still widely cited by traditional general equilibrium theorists as well as economists working in the economics of information (Hayek, 1945).

### **The abuse of reason project and the road to serfdom**

Though Hayek felt he had launched a telling attack against socialism, few in the late 1930s were persuaded by his economic reasoning. Hayek began to realize that the attractiveness of socialism went far beyond economics. Socialists promised a society that was not only more efficient than capitalism, but also one that was more just, where individuals have more self-determination and greater political freedom, and in which scientific reasoning would be used to improve upon a host of outdated social institutions. If he were

successfully to challenge these utopian visions, economic arguments were not enough. He would need to develop political, historical and ethical arguments against them as well.

During the Second World War Hayek began doing just that, in a massive piece of work that he called the ‘Abuse of Reason’ project. His overarching goal was to show how a number of then-popular doctrines and beliefs, doctrines with which he disagreed, had a common origin in some fundamental misconceptions about the proper methods for studying social phenomena. Central to his argument was the critique of *scientism*, which he defined as the ‘slavish imitation’ of the methods of the natural sciences in the study of social phenomena (Hayek, 1942–44, p. 24). He criticized the objectivism, historicism and collectivism of the ‘scientistic prejudice’, and contrasted these with his own preferred approach, one that was subjectivist, theoretical, and individualist. In the essay ‘Scientism and the Study of Society’ (Hayek, 1942–44) he also articulated a fundamental thesis about the limitations of our knowledge in the social sciences: that rather than make precise predictions often the best we can do is to make a pattern prediction, or alternatively to provide an explanation of the principle by which some social phenomenon came into being.

Hayek never completed the Abuse of Reason project, although sections of it were published separately during and after the war. One of these became his most famous book, *The Road to Serfdom*. As noted above, many advocates of socialism had promised that socialism would bring greater political freedom. In *The Road to Serfdom* Hayek countered that planning of the economy would soon lead to increasing political control as well. One of the virtues of a market economy is that it allows people with very different tastes to express them, and (for those with the means) to get them satisfied, through the market. In a planned economy, socialist managers must decide which goods, and in what quantities, get produced. Invariably some people will not like the decisions they make, and will protest. A change in the mix will cause others to protest. If any progress is to be made, even democratically elected socialist regimes will at some point be forced simply to make the decisions for the people. This is much easier to do if political dissension is suppressed. Hayek’s claim was that, to run a fully socialized planned economy successfully, its socialist managers ultimately must secure control of the political process as well.

Hayek’s book was only one of many at the time to address the issues of planning versus markets and other issues related to the shape of the post-war economic and political order. Its fame, and in some quarters notoriety, was due to its being condensed in the pages of *Reader’s Digest* in April 1945, appearing just as the war in Europe was coming to an end. *Reader’s Digest* then had a circulation of almost nine million, and in addition, a Book of the Month Club reprint was made available that added another million readers. As a result, Hayek’s little book, and the even smaller condensed version, gained widespread attention and iconic status among both its supporters and critics.

Besides fame, the publication of the book brought with it other unintended consequences. On a publicity trip to the United States, Hayek made a number of contacts, people who shared his views regarding the merits of a liberal democratic market order. In 1947 he organized the first meeting of the Mont Pèlerin Society, which brought together like-minded people from America and Europe to discuss and debate questions concerning the appropriate economic, political, legal and social institutional framework for a free society. Participants included Milton Friedman, Aaron Director and George

Stigler, who would over the course of the next decade form the Chicago School of economics.

### **The sensory order**

From 1945 until he joined the faculty at Chicago, Hayek took on yet another wholly different subject, theoretical psychology. Building on a student paper he had completed in 1920, he titled the resulting book *The Sensory Order* (Hayek, 1952).

This book is probably best viewed as an outgrowth of his earlier attack on scientism. Two ‘objectivist’ doctrines that he criticized in the ‘scientism’ essay were physicalism, a view espoused by the logical positivist philosopher Otto Neurath, and behaviourist psychology. The doctrines were related: physicalism insists that all truly scientific statements make reference only to observables, and behaviourist psychology likewise insists that scientific psychology should eschew all reference to mental states and deal only with observable behaviour. By eliminating all reference to subjective states and interpretations, the objectivity of science is guaranteed.

Hayek posited two orders, the sensory order that we experience, and the underlying natural order that natural science has revealed: atoms, molecules, electromagnetic waves and the like. The question arises: why are these two orders different? Hayek’s answer was that the sensory order is in fact a product of our brain. He characterized the brain as a highly complex but self-ordering, hierarchical classification system, a huge network of connections. A given stimulus triggers an extensive set of neuronal firings that gives rise to our experience of a sensation. The richness of our sensory experience is due to the sheer vastness and hierarchical nature of the classifier system. As he once noted, ‘During a few minutes of intense cortical activity the number of interneuronic connections actually made (counting also those that are actuated more than once in different associational patterns) may well be as great as the total number of atoms in the solar system (that is,  $10^{56}$ )’ (Hayek, 1964, p. 25).

If Hayek’s description was right it posed problems for behaviourists, who did not even recognize the existence of the two orders, taking the sensory order as fundamental. Furthermore, the supposedly uninterpreted sensory experience so vital to the behaviouralist was itself simply a product of our minds; it was itself an interpretation. Hayek’s book went virtually unnoticed when published, but subsequent neuroscientific research broadly supports his principal claims.

### **Political theory**

J.M. Keynes read Hayek’s *The Road to Serfdom* on a boat going to the Bretton Woods conference, later writing to Hayek that ‘morally and philosophically I find myself in agreement with virtually the whole of it; and not only in agreement with it, but in a deeply moved agreement’ (Keynes, 1944, p. 385). Keynes went on to say, though, that

You admit here and there that it is a question of knowing where to draw the line. You agree that the line has to be drawn somewhere, and that the logical extreme is not possible. But you give us no guidance whatever as to where to draw it. (1944, p. 386)

Hayek evidently took the criticism to heart, for in the coming years he would make two further important contributions to political philosophy that would refine and extend the arguments made in *The Road to Serfdom*.

In *The Constitution of Liberty* Hayek defined *liberty* as a condition ‘in which coercion of some by others is reduced as much as possible in society’ (Hayek, 1960, p. 11). This poses a dilemma, because the best way to avoid coercion is to set up a coercive power that is strong enough to suppress it. Liberal constitutionalism attempts to solve the problem by defining a private sphere of acceptable individual activity, granting the state a monopoly on coercive powers, then constitutionally limiting the power of the state to those instances where it is required to prevent coercion. The state’s coercive actions are limited by the rule of law: its laws made in protection of the private sphere must be prospective, known, certain, and equally enforced (Hayek, 1960, pp. 205–10). He contrasted these with laws that seek particular outcomes within the private sphere, for example, price-fixing to help certain groups, or social legislation whose intent is to create or preserve a particular pattern of redistribution. Hayek linked his discussion with his perennial concern for problems caused by dispersed knowledge by noting how liberty enables individuals to make the best use of local knowledge:

The rationale of securing to each individual a known range within which he can decide on his actions is to enable him to make the fullest use of his knowledge, especially of his concrete and often unique knowledge of the particular circumstances of time and place. The law tells him what facts he may count on and thereby extends the range within which he can predict the consequences of his action. (Hayek, 1960, pp. 156–7)

In the last third of the book Hayek outlined the specific sorts of government policies that are consistent with constitutional liberalism.

Soon after completing this book he felt the need to readdress some of the same questions, ultimately producing the trilogy *Law, Legislation and Liberty* (1973–79). There Hayek lamented how Western democracies were increasingly circumventing the constitutional constraints outlined in his earlier book. Because the ideals of constitutionalism had failed to take root, the rule of law was weakening. Governments were increasingly passing coercive legislation, typically under the guise of achieving social justice, that in reality typically served well-organized coalitions of special interests. Coercive legislation was gradually replacing the rule of law.

Hayek began by contrasting spontaneous, self-generating orders (what the Greeks called a *kosmos*) with organizations that are constructed, created orders (what the Greeks referred to as a *taxis*). Agents in organizations aim at accomplishing specific goals, and do so by following explicit commands. Grown orders tend to be much more complex. They do not aim at specifiable outcomes, and agents interact in them by following abstract rules. Hayek applied these ideas to the development of the law, or *nomos*, in which rules of just conduct eventually become codified into law. He contrasted this common law heritage with legislation, the rules for organizing government, also known as *thesis*. Under the influence of various rationalist constructivist doctrines (Hayek identifies utilitarianism and legal positivism as particularly noxious), legislation to achieve particular ends began to replace the grown law, which itself does not aim at specific outcomes but instead provides a stable ordered environment in which individuals are able to employ their knowledge to make decisions.

In developing these contrasts, Hayek argued that though the concept of justice provides the foundation for notions of just conduct and ultimately of the law itself, the idea of *social justice* only has meaning within the context of a *taxis*. Only human conduct by individuals or organizations, not states of affairs or outcomes, can be called just or unjust. One must be able to hold someone responsible to apply the term. Rationalist constructivists make a fundamental error, a category mistake, to argue that it can also be applied to the outcomes of a spontaneous process, which has no specific purpose other than to allow millions of agents to pursue their own purposes. Hayek ended his trilogy with the pessimistic view that majoritarian democratic governments operating under the errors of constructivism and the guise of achieving greater social justice were increasingly replacing grown law with legislation, most of which served powerful special interests, with dire consequences for the persistence of the grown order. In the final chapter he proposed a unique political reform that aimed at increasing the independence of legislators from the influence of special interests, thereby strengthening the ideal of liberal constitutionalism. Interestingly, about the same time Hayek (1978) also proposed an equally provocative scheme for the competing currencies that he dubbed the denationalization of money.

His final major contribution was *The Fatal Conceit* (Hayek, 1988), the conceit being socialism – for Hayek the ultimate form of rationalist constructivism. The book had its origins in the late 1970s, when he tried to arrange a debate between socialists and advocates of markets on the merits of their respective systems. Though the debate never came off, the project led him to begin work on a final wide-ranging critique of socialism and constructivism. Hayek worked on the book during the early 1980s, but when his health began to fail in 1985 the philosopher W.W. Bartley III (who was also the general editor of *The Collected Works of F.A. Hayek*) stepped in to assist him. Questions have been raised about how much of the book should be attributed to Bartley and how much to Hayek, but one fundamental Hayekian claim is that the moral rules, norms, ethical precepts and practices that have led to the development of the extended market order have emerged through a process of cultural evolution. Many of these rules go against the ‘natural morality’ that allowed earlier humans to function successfully in small hunter-gather groups. Furthermore, because they were seldom consciously adopted and their effects are often difficult to identify, they tend to chafe against human reason, as well. Many of our moral beliefs, then, lie between, and fit uneasily with, both our instinct and our reason. This is why humans instinctively rebel against the market order, and seek to use their reason to construct an alternative.

A theme that runs throughout Hayek’s work is an emphasis on the limits of our reason, and the role of rule-following in allowing us to deal successfully in a world in which knowledge is dispersed. In field after field Hayek identified spontaneous complex orders that form as the result of agents following rules. The price system represents one such an order, and, as his work on capital theory showed, if one extends the system in time it can also serve as a mechanism for the intertemporal coordination of human action. The brain is another example of a self-organizing complex order: vast networks of neuronal firings give rise to the larger phenomenon of consciousness. Within political theory, the common law tradition (as opposed to legislation) and the requirement that we follow the rule of law and obey constitutional rules are yet another manifestation of our discovering procedures that allow us to deal more successfully with the limits of our reason.

It is unfortunate that Hayek remains in some quarters a controversial figure, but it is also probably inevitable, given that so many of his key

insights were formed within a context of intense political debate, and that it is difficult to separate them from that context. Even so, one hopes that his contributions on knowledge and its limits, on the role of grown institutions in helping us to overcome our ignorance, and on the workings of hierarchical networks and spontaneous self-organizing complex orders, will continue to stimulate future research.

**Bruce Caldwell**

### See also

- < xref = xyyyyyy > Austrian economics;
- < xref = xyyyyyy > Friedman, Milton;
- < xref = xyyyyyy > Mises, Ludwig Edler von;
- < xref = xyyyyyy > Robbins, Lionel Charles;
- < xref = xyyyyyy > socialist calculation debate.

*Bibliographical note:* the book series *The Collected Works of F.A. Hayek*, published jointly by the University of Chicago Press and Routledge, is currently in process of production. The series consists of annotated versions of all of Hayek's major works, as well as supplementary material. Each volume contains an extensive editorial introduction to set the work in context. In the list of Selected works below, references are made to those volumes of the *Collected Works* edition that have already appeared, otherwise to the original edition.

### Selected works

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| 1926    | Monetary policy in the United States after the recovery from the crisis of 1920. In <i>Good Money</i> , Part I, ed. S. Kresge; vol. 5 of <i>Collected Works</i> , 1999. |
| 1928    | Intertemporal price equilibrium and movements in the value of money. In <i>Good Money</i> , Part I, ed. S. Kresge; vol. 5 of <i>Collected Works</i> , 1999.             |
| 1931    | <i>Prices and Production</i> , 2nd edn. London: Routledge, 1935.  |
| 1933    | <i>Monetary Theory and the Trade Cycle</i> . New York: Kelley, 1966.  |
| 1935    | <i>Collectivist Economic Planning: Critical Studies on the Possibilities of Socialism</i> . London: Routledge.  |
| 1937    | Economics and knowledge. Repr. in Hayek (1948).   |
| 1941    | <i>The Pure Theory of Capital</i> . Chicago: University of Chicago Press.   |
| 1942–44 | Scientism and the study of society. Repr. in Hayek (1952b).   |
| 1944    | <i>The Road to Serfdom</i> . In <i>The Road to Serfdom: Text, Documents</i> , ed. B. Caldwell, vol. 2 of <i>Collected Works</i> , 2007.                                 |
| 1945    | The use of knowledge in society. Repr. in Hayek (1948).   |
| 1948    | <i>Individualism and Economic Order</i> . Chicago: University of Chicago Press.   |
| 1952a   | <i>The Sensory Order: An Inquiry into the Foundations of Theoretical Psychology</i> . Chicago: University of Chicago Press.   |
| 1952b   | <i>The Counter-Revolution of Science: Studies on the Abuse of Reason</i> . Glencoe, IL: Free Press.   |
| 1960    | <i>The Constitution of Liberty</i> . Chicago: University of Chicago Press.  |

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 1967 *Studies in Philosophy, Politics and Economics*. Chicago: University of Chicago Press.  
 1968 Competition as a discovery procedure. Repr. in Hayek (1978b).  
 1973–9 *Law, Legislation and Liberty*, 3 vols. Chicago: University of Chicago Press.  
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 1978b *New Studies in Philosophy, Politics, Economics and the History of Ideas*. Chicago: University of Chicago Press.  
 1988– *The Collected Works of F.A. Hayek*, Chicago and London: University of Chicago Press and Routledge.  
 1988 *The Fatal Conceit: The Errors of Socialism*. In *Collected Works*, vol. 1, ed. W.W. Bartley III, 1988.  
 1994 *Hayek on Hayek: An Autobiographical Dialogue*, eds. S. Kresge and L. Wenar. Chicago: University of Chicago Press.

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### Index terms

Austrian business cycle theory  
 Austrian economics  
 average period of production  
 behaviourism  
 Böhm-Bawerk, E. von  
 capital theory

Chicago School  
 common law  
 complements  
 complex phenomena  
 constitutionalism  
 constructivism  
 currency competition  
 general equilibrium  
 Hayek, F. A. von  
 information aggregation and prices  
 intertemporal equilibrium  
 Keynesian Revolution  
 knowledge problem  
 liberty  
 majoritarianism  
 markets  
 Mises, L. E. von  
 money  
 Mont Pèlerin Society  
 natural rate and market rate of interest  
 neutrality of money  
 new institutional economics  
 planning  
 public choice  
 roundabout methods of production  
 rule of law  
 scientism  
 social justice  
 socialism  
 socialist calculation debate  
 special interests  
 spontaneous order  
 substitutes  
 tacit knowledge  
 Wicksell, J. G. K.

### **Index terms not found:**

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 majoritarianism  
 Mises, L. E. von  
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