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FRIEDRICH VON HAYEK'S CONTRIBUTION TO ECONOMICS*

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Bibliographical Overview

A list of Hayek's publications from 1924 to 1969 is appended to this review.¹ It is divided into four groups: books (B), pamphlets (P), books edited or introduced (E), and articles in learned journals or collections of essays (A).

Some of Hayek's 15 books appeared also in foreign translations. There are altogether 20 foreign-language editions (in eleven different languages), so that the combined count comes to 35 books. The bibliography contains 10 pamphlets, and 10 books edited or introduced by Hayek. This brings the number of items listed on file cards of library catalogues to 55.

The list of articles in learned journals or collections of original essays contains 131 titles. Of these, 83 are in English, 41 in German, and 7 in other languages. Reproductions or translations of articles in books of readings (anthologies) are not included in the list.

A classification by subject matter will be somewhat arbitrary since so many of Hayek's writings cover more than one field. I would assign five of his 15 books to (pure or monetary) economic theory, nine to political and legal philosophy and intellectual history, and one to psychology. Three of the books are collections of essays, most of them published previously. Of his ten pamphlets, four are on economic theory or policy, five on political philosophy, and one on a political issue. For this 131 articles I have attempted a more detailed breakdown:

Economic Theory	45
Money and prices	21
Capital and interest	11
Investment cycles	10
Growth and economic history	3
Economic Policy	11

* Editor's note: Professor Machlup's original manuscript contained a brief biographical sketch which has been omitted in this version as the Official Announcement from the Royal Academy of Sciences, reprinted above, gives essentially the same information.

¹ I have used, with some amplification of the references provided, the bibliography included in Erich Streissler, ed., *Roads to Freedom: Essays in Honour of Friedrich A. von Hayek*, London 1969, pp. 309-315.

Socialism and Planning	8
Miscellaneous economic problems	4
Economics in politics	4
Biographies, including obituaries	24
Intellectual History	5
Political and Legal Philosophy	17
Philosophy of Science	13

Money, Credit, Capital and Cycles

My decision to discuss under one heading what some economists might treat separately is fully in conformance with Hayek's own view of these subjects. Additional money is usually issued by the way of credit to producers; credit gives them command over productive resources, which they use chiefly for the production of capital goods; and changes in the capital structure of the economy may take the form of cyclical sequences of booms, crises, and depressions.

At one point, after deploring that the theory of the trade cycle had not thus far received adequate assistance from the theory of capital, Hayek ventured the idea that in the future the relationship between the two theories may be reversed and that capital theory may benefit from the progress of cycle theory:

Only by studying the changes of the capitalistic structure of production will we learn to understand the factors which govern it, and it seems that the trade cycle is the most important manifestation of these changes. It is therefore not surprising that the study of the problems of the trade cycle should lead to the study of the theory of capital. (B-2, 2nd ed., p. 104.)

Closely in line with this program, Hayek's first book was on *Monetary Theory and the Trade Cycle* (B-1, German ed. 1929); his second book, *Prices and Production* (B-2, 1931), explored the changes in capital structure due to the credit cycle; and, then, 32 articles and 2 books later, came his treatise on *The Pure Theory of Capital* (B-5, 1941).

Early Steps: 1924–1931

The first steps in this research program were a few articles published in German; the first two appeared in 1924 and 1925, after Hayek returned to Austria from a visit of the United States. The second of these articles was on "The Monetary Policy of the United States Since the Crisis of 1920" (A-2). He returned to the theme of the boom in the United States in another article in German (A-6, 1928, p. 67), in which he took exception to the view then dominant that the absence of rising price levels would guarantee lasting prosperity. He credited the slightly declining price level with the unusual duration of the prosperity but warned that a downturn might come as soon as the price level stopped declining. Perhaps I should remind the reader of the

prevalent thinking of the time. The United States had reached a state of prosperity with an expansion of its monetary base, of its credit superstructure, of its investment and general business activity, but without an increase in its general price level. Economists almost unanimously praised this development, and some even announced that a “new era” had arrived with continuing prosperity without a danger of a subsequent crisis and depression. Hayek demurred: stability of the price level was not an assurance against a downturn, indeed it was covering up a large inflation of credit and an overexpansion of investment, which eventually would have to lead to a painful readjustment. In a comment which Hayek published in the Monthly Reports of the Austrian Institute for Economic Research (as its Director) in February 1929, he boldly predicted that crisis and downturn in the United States might be imminent. With these warnings, which came true with a vengeance, Hayek had introduced one of the main theses of his monetary theory of the investment cycle.

Two other contributions to the subject of credit, capital, and cycles (A-7, 1928, and A-9, 1929) preceded the publication of his first book, all in German, and much noticed in Germany and Austria but not in English-speaking countries. Early in 1931, when Hayek was invited to give four lectures at the London School of Economics, which were published under the title *Prices and Production* (B-2, 1931), the “drama” began.

The “Drama”, 1931–1936

It was Sir John Hicks¹ who referred to this period as a drama:

When the definitive history of economic analysis during the ninetenthirties comes to be written, a leading character in the drama (it was quite a drama) will be Professor Hayek ... there was a time when the new theories of Hayek were the principal rival of the new theories of Keynes. Which was right, Keynes or Hayek?

Keynes' two volumes *A Treatise on Money* appeared in 1930, when Hayek's manuscript of *Prices and Production* was almost completed. Keynes, as editor of the *Economic Journal*, assigned Hayek's book to Piero Sraffa of Cambridge for review; Robbins, as editor of *Economica* assigned the Keynes work to Hayek for review. Hayek published his review article in two parts (“Reflections on the Pure Theory of Money of Mr. J. M. Keynes,” (A-10) in August 1931 and in February 1932. Keynes published a reply to Part I of Hayek's review (criticizing Hayek's book) in *Economica* in November 1931, and Hayek came back with a rejoinder in the same issue. Sraffa published his review article (“Dr. Hayek on Money and Capital”) in March 1932. Hayek's reply to Sraffa appeared in June 1932 (A-12) together with Sraffa's rejoinder. These exchanges, however, were not the only ones. There were reviews, notes, and replies by Hawtrey, Pigou, and Robertson, to mention only those in the two journals edited in Cambridge and London. Of contributions in other journals we should mention

¹ Sir John Hicks, “The Hayek Story” in *Critical Essays in Monetary Theory*, Oxford, 1967, p. 203.

the review by Arthur Marget in the *Journal of Political Economy*, April 1932 who compared the two rivals and sided with Hayek, and the article by Alvin Hansen and H. Tout ("Annual Survey of Business Cycle Theory: Investment and Saving in Business Cycle Theory") in *Econometrica*, April 1933, which incited a reply by Hayek ("Capital and Industrial Fluctuations," A-23) in April 1934.

In addition to his review of Keynes and his replies or rejoinders to Keynes, Sraffa, and Hansen and Tout, Hayek published between 1932 and 1936 ten articles on the subject, six of them in English. But after this sketch of the excitement which Hayek's theories caused in those years, I must now turn to their contents.

The Main Theses

The most essential feature in Hayek's theory of the investment cycle is the "scarcity of capital" which in Spiethoff's theory had been the immediate cause of the crisis. Spiethoff's explanations, however, had never made it clear just how this scarcity came about and how it manifested itself. Hayek's model offered the elucidation how overinvestment would lead to scarcity of capital, compelling a cutback in investment and even the abandonment of some of the real capital that was produced owing to the excessive rate of investment.

For some of his most important theses Hayek gives generous credit to Knut Wicksell. Wicksell had seen that the controversy between the monetary and the structural theories of the business cycle was based on false distinctions since monetary causes could lead to structural disturbances. By lowering the market rate of interest below the natural rate—the rate of interest that would hold the rate of real investment down to the rate of voluntary saving—the banking system was able to initiate a cumulative movement away from equilibrium. Hayek made two important amendments to this thesis. First, the credit expansion need not be initiated by the banks lowering the money rate of interest; it could be initiated by a rise in the opportunities for profitable investment—for example, through a wave of entrepreneurial optimism or through technological inventions—which raised the natural rate of interest while the banks would satisfy the increased demand for credit at unchanged money rates (B-1, p. 95). Second, whereas Wicksell had assumed that equality of natural and money rates of interest would guarantee stability of the general price level and that, therefore, such stability would indicate that the banking system was lending at the natural rate, Hayek recognized (as, I believe, Myrdal had done independently) that stability of the price level and equality between investment and voluntary (or intended) saving may not be compatible with each other (B-2, 2nd ed., pp. 24 ff.). In particular, in a growing economy the rate of interest that stabilizes the price level, by allowing a credit expansion corresponding to the increase in the volume of transactions, must be below

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the rate that keeps the supply of money capital at the level of voluntary saving (p. 27).

Hayek rejected three (at the time) generally accepted positions: (1) that money acts upon prices and production only if the general price level changes, (2) that a rising price level always causes an increase in production, and (3) that monetary theory was mainly, if not exclusively, the theory of how the value of money is determined. He demonstrated that almost any change in the quantity of money influences relative prices, no matter whether or not it changes the general price level; and that the real task of the theory of money is to show the influences of changes in the quantity and distribution of money upon the exchange ratios between different goods and upon the allocation of resources to the production of different goods. The most elementary distinction of this type is the distribution of monetary demand between consumers' goods and producers' goods (B-2, p. 36), but it is more useful to distinguish successive stages of production, from the earliest ones (those farthest away from consumption) to the latest stage, producing finished consumers' goods. Hayek showed what changes in the structure of production are ordinarily caused by changes in the proportion between consumer demand and investment demand (pp. 39-68).

Sudden changes in the proportions between consumer and investment demand, and thus in the structure of production, may lead to disturbances, and these disturbances are apt to take the form of crises if they involve a sudden need to shorten the investment period by requiring the use of more resources for the production of consumers' goods (p. 58). This need may arise either as a result of a sudden and drastic decrease in the supply of voluntary saving or as a result of a return to a normal rate of saving after an overexpansion of investment credits with the temporary "forced saving" that it involves. Drastic fluctuations of voluntary saving are not likely to occur with any frequency, but spells of forced saving are easily produced by the elasticity of bank credit, which reacts to an increase in demand by expansions of supply instead of increased market rates of interest. The induced increase in investment causes a lengthening of the production process or, in a more modern terminology, a deepening of the capital structure. The new structure could be maintained only if the new proportion between consumer demand and investment demand could be maintained. Since the additional money funds paid out to the factors of production employed in increased proportions in the earlier stages of production are almost certainly, with only brief time lags, going to swell the demand for consumers' goods, the artificially achieved new proportion can be maintained only if investment funds are continually increased by bank credit (and dishoarding) supplied at a continually increasing rate. This, however, cannot happen, either because the banks find it impossible or too risky to go on expanding at an increasing rate (p. 90), or because investors find it too risky to go on borrowing and investing. As soon as the inevitable

increase in consumer demand becomes large enough to increase the proportion of consumer to investment demand, productive factors will be shifted away from earlier stages of production. It will prove impossible to complete some of the longer production processes; particular producers of capital goods will find it unprofitable to continue producing at full scale; other stages of production will be affected by the slow-down; and capital invested there will lose in value, and some may even have to be abandoned.

This exposition of the cyclical sequence of induced lengthening and painful re-shortening of the capitalistic production process under the influence of changes in the proportions of monetary demand is then supplemented by Hayek's exposition of the same sequence in terms of relative prices. He advances a most ingenious theory of the price structure that induces firms to make the reallocations of resources leading to the described changes in the capital structure. He constructs a model of the price mechanism that accomplishes first the shift of non-specific resources from later to earlier stages of production, then their retransfer to later stages, and he shows a behavior of profit margins in line with these adjustments, inclusive of the appearance of heavy losses in those early stages that use, but will be unable to use fully, specific real capital such as buildings or machinery not adaptable to other uses. Hayek's innovation consists in making changes in the rate of interest equivalent to changes in the price margins obtainable by producers in different stages of production. If the entire margin between prices of original factors of production—let us think of wages of labor—and prices of finished consumer's goods is interpreted as interest for the time elapsed between the input of factors and the output of consumption goods, and if the whole production process is subdivided into stages the number of which increases when the process is lengthened and decreases when it is shortened, then the margin obtained by each stage will decline when the process is lengthened and increase when the process is shortened (pp. 74–78, 91). A reduction in the rate of interest will be the equivalent of a narrowing of price margins, and an increase in the rate will be the equivalent of their widening. The widening of the margins indicates that only the "less capitalistic" (shorter) production processes can be profitable, while the "more capitalistic" (longer) ones lose money and some of them are abandoned, leaving specific capital goods partly or fully unused, and complementary nonspecific factors of production unemployed.

The inevitability of the crisis attending the adjustment of the economy after its overextension, a crisis resulting in excess capacity of durable capital equipment and in unemployment of labor, is probably the most characteristic (and most criticized) thesis in Hayek's theory of the trade cycle. Since in his model the crisis begins when consumer demand reasserts itself (after having been suppressed in real terms by the artificial enlargement of credit-financed investment) the possibility of avoiding or curing the depression through even greater support to effective demand is questioned, if not definitely

denied, by Hayek (A-23; B-2, p. 154). The policy implication of his theory is that support to investment demand would be wrong, since overextension of credit and investment was the basic disease; but support to consumer demand would also be wrong, since it was its increase that stopped the investment boom and forced the painful adjustment; to increase it even more would induce a shortening of the production period far beyond what is called for by normal saving and consumption habits. The recipe, therefore, was to let the depression run its course (p. 99). Hayek recognized the possibility of a “secondary” deflation of credit and demand, which might theoretically be avoided by the right monetary policy, but he saw no possibility of ascertaining in practice where the necessary adjustment ended and the “secondary monetary complications” began.

Supplementary Theses

The fundamental thesis of Hayek’s theory of the business cycle was that *monetary* factors *cause* the cycle but *real* phenomena *constitute* it (B-2, 2nd ed., p. xiii). Several hypotheses about the monetary factors must therefore supplement the main thesis concerning the real phenomena.

The most interesting of the supplementary hypotheses are those that pertain to the construct of “neutral money”, another idea that goes back to Knut Wicksell (B-2, p. 31). By Hayek’s definition, money is neutral if all exchange ratios among goods and services are what they would be if money did not exist except as a numéraire in a general-equilibrium system; that is to say, therefore, if they are not affected by the existence of money as a means of payment and store of value.

Hayek made it clear that this was only a pure construct, an instrument of analysis, but not a precept of policy, even if we might be well advised to establish a monetary system and pursue a monetary policy that would approach the condition of neutrality. A stable price level in a growing economy would surely not satisfy this condition, and a rising price level still less. A constant quantity of money would come closer to it were it not for changes in the velocity of its circulation and in the coefficient of money transactions (which measures the money work to be done in relation to given volumes of production, which is altered when, as in the case of a merger between a supplier and his chief customer, payments of money are replaced by mere book-keeping operations). Not only would it be practically very difficult to adjust the quantity of money for just these variations in its effectiveness but, as Hayek fully realizes, the additional requirements of neutrality, that all prices are completely flexible and all contracts are based on correct anticipations of future price changes, are too far from actual conditions to make neutral money a possible goal of policy.

Apart from these discussions of an ideal money system, Hayek presents some sharp insights into the system as it actually works. Some of his strictures

against the "elastic system" that our monetary authorities try to manage with a view to keeping interest rates stable, and especially to keep them from rising, have not lost their timeliness. Indeed, some of the ideas which Hayek shows to be fallacious have gained in strength since the nineteen-thirties; a re-reading of Hayek's theses on stabilizing monetary policies might have a beneficial influence on the policy makers of the 1970's.

A Methodological Note on Aggregative Theorizing

I was especially cheered by a brief methodological remark of Hayek's on the differences in approach between monetary and general economic theory. I hope my readers will understand my desire to call their attention to it.

Hayek finds it intellectually unsatisfactory

if we try to establish *direct* causal connections between the *total* quantity of money, the *general level* of all prices and, perhaps also the *total* amount of production. For none of these magnitudes *as such* ever exerts an influence on the decisions of individuals: yet it is on the assumptions of a knowledge of the decisions of individuals that the main propositions of non-monetary economic theory are based ... If ... monetary theory still attempts to establish causal relations between aggregates or general averages, ... [it] lags behind the development of economics in general. In fact, neither aggregates nor averages do act upon one another ... (B-2, 2nd ed., p. 4).

With this remark Hayek anticipated a discussion which many years later engaged the protagonists of macro-economic and micro-economic analyses and which established, at least to my satisfaction, that we have not completed our task before we have ascertained the micro-economic basis of all macro-economic theorizing. If an authority is to be cited in support of this proposition, I choose Robert Solow.

Ideas Have Their History

In proposing new hypotheses some eminent writers are prone to refer to previous literature only in order to show how wrong all or most of their predecessors had been and how great an advance in knowledge their own work therefore constitutes. Hayek, in sharp contrast with this practice, goes out of his way to find and show all traces of the ideas he offers for our consideration. As an enthusiastic but honest historian of ideas, he presents us with careful miniature histories on virtually every major issue that figures in the development of his theories. At least one reviewer—Arthur Marget (*J.P.E.*, *loc. cit.*, pp. 262 and 263)—pays tribute to "the fine feeling which Dr. Hayek shows in the way of scholarly appreciation of the achievements" of past theorists and to Hayek's modest and "calm scholarship" in contrast with the "swinging and assured brilliance" of some of his rivals.

Examples of such miniature histories of ideas are the doctrinal surveys of theories of money and prices, creation of bank credit, forced saving, neutral

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money, to mention only a few of those presented in connection with Hayek's first two books.

The Rivalry with Keynes

Hayek's review articles of Keynes' *Treatise* (A-10, 1931 and 1932) angered Keynes' constituency in Cambridge and left them with the feeling that Hayek had misunderstood and misinterpreted their master's theories. I suspect, indeed I confidently believe, that the most loyal followers of Keynesian views, if they now re-read Hayek's criticisms, would accept many of them partly or fully. Keynes himself probably did so after he had progressed from the *Treatise* (1930) to the *General Theory* (1936), in which he repudiated many of his previous propositions and formulations.

I want to refer particularly to Hayek's critique of Keynes' views on Saving and Investment (A-10, Part I, p. 24). Keynes either had never read or had seriously misunderstood Wicksell's exposition. His constructs of *S* and *I* were quite different from Wicksell's, yet he came to the very same conclusion which Hayek and Myrdal had found erroneous in Wicksell's argument, namely, that the rate of interest that would equate *S* and *I* would also keep the general price level stable.

Good Keynesians would also accept Hayek's critique (*loc. cit.*, p. 40) of the explanation of the trade cycle in Keynes' *Treatise*. Keynes, at that time, thought that increases in prices of consumers' goods and in the resulting profits (windfalls) were the principal criteria of the boom. Needless to say, an increase in investments was part of Keynes' 1930 model of the boom, but it did not play the major role that it was correctly assigned in the 1936 model presented in the *General Theory*. There are many other points on which Hayek's critical comments were well taken but which at the time added to the antagonistic feelings in the rival camp.

With the appearance of the *General Theory* the "drama" was ended. By then, after several years of the Great Depression, it had become clear that Hayek's prescription of "waiting it out" was inopportune. Only few students of the depression were willing to give earnest consideration to hypotheses from which so unacceptable policy recommendations were derived. In those years of "secular" stagnation and unemployment, a model for which full employment was the starting assumption could not compete with one that was based on underemployment equilibrium and from which a prescription of vigorous government action for more employment was derived. Keynes' new theory of underinvestment and underconsumption was victorious, not only over Hayek's theory of overinvestment and overconsumption but also, for a period of years, over all economic analysis that featured micro-economic equilibria and optimal resource allocation at a time when general unemployment of virtually all kinds of resources was the prevalent condition almost everywhere.

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Scholars' Appreciation of Hayek's Hypotheses

The victory of Keynes' theory on the political scene and in the halls of the universities did not mean that all scholars turned their backs to Hayek's hypotheses. I want to present the testimonies of four eminent economists who recognized the validity of the Hayekian models of the maladjusted time-structure of production.

Sir Dennis Robertson, though unwilling to accept Hayek's hypotheses as a general theory of the trade cycle, found them valid as a description of special kinds of cycles and fully applicable as explanation of some of the industrial fluctuations in the 19th and early 20th centuries. As an illustration he pointed to the crisis of 1909 with the preceding boom and the subsequent depression.

Joseph Schumpeter took a similar position.¹ Let him speak for himself:

... the reader knows by now that the author is not a wholesale admirer of Professor von Hayek's theory *as far as it claims to be a fundamental explanation* of the causes of the cycle. All the more it is a duty to point out that the course of American events in the twenties and thirties of the nineteenth, not less than the course of events of the twenties and thirties of the twentieth century, invites interpretation in terms of that theory. In fact, when we observe the behavior of the price level which was such as to negative all idea of 'inflation' according to one definition, and the behavior of the banking sphere which spells violent inflation according to another definition, and when thereupon we further observe what happened between 1836 and 1840, fairness almost compels us to tender to that eminent economist our most sincere congratulations.

Again, with regard to the 1850's, Schumpeter recognized (*op. cit.*, p. 333) "the presence of a Hayek effect: in a very obvious sense the period of production was lengthened beyond what the economic organism could stand for the moment."

Sir John Hicks (*op. cit.*, p. 210 ff.) appreciated Hayek's model as a contribution to the theory of growth:

The Hayek theory is not a theory of the credit cycle ... It is an analysis—a very interesting analysis—of the adjustment of an economy to changes in the rate of genuine saving. In that direction it does make a real contribution. But it is a contribution which, when it was made, was out of due time. It does not belong to the theory of fluctuations, which was the centre of economists' attention in 1930; it is a fore-runner of the growth theory of more recent years.

According to Hicks, some of the issues to which Hayek drew attention were such "that economists found it hard to understand and which perhaps even now [1967] have not been completely cleared up" (*op. cit.*, p. 203). The Hayek theory may apply to the inflationary conditions of our time, for if "rapid" inflation

is to be kept down to a finite rate of inflation, there must be unemployment. This is the Hayek 'slump'. To such conditions the Keynesian prescription is irrele-

¹ Joseph A. Schumpeter, *Business Cycles*, Vol. 1, New York and London, 1939, p. 296 n.

vant, as irrelevant as Hayek's was in 1931. Hayek's prescription—the direction of policy towards the restoration of the marginal productivity of labour to a normal level ... —will then after all be right (p. 215).

Erich Streissler (*op. cit.*, p. 245 ff.) agrees with Hicks that the major use of the Hayek model is in the theories of long-term economic growth. He regards Hayek's studies on the durability of capital goods his "most important and permanent contribution" to the theory of capital (p. 259), and he points to places, periods, and sectors of the economy to which the "Hayek process" applies—presumably not only as explanation of rates of growth but also as explanation of cyclical phenomena. He emphasizes the building industry (p. 272), the inventory cycle (p. 275), and the formation of human capital through investment in education (p. 283):

Thus Hayek's theory of capital in its most full-scale development finds its most fruitful application today in the analysis of the problems of qualified labour, of the economics of education. In human capital we find all the features of the Hayek process.

He mentions the trend toward lengthening the investment period, interrupted by a process of shortening it when job opportunities become particularly favorable.

Elaboration and Reconstruction of Capital Theory

When his ideas, which first had "fascinated the academic world of economists"¹ got "out of fashion", Hayek did not give up; he continued to elaborate, refine and reformulate his theories. Some of this work is included in his fourth book, a collection of essays under the title *Profits, Interest, and Investment* (B-4, 1939). The main theme was to show "why under certain conditions ... an increase in the demand for consumers' goods will tend to decrease rather than to increase the demand for investment goods" (p. 3). He explained how the "principle of acceleration of derived demand" could become inverted into a "deceleration principle" (p. 33).

The collection contains also an article on "The Maintenance of Capital" (A-27), to which a reply by Pigou and a rejoinder by Hayek were published in 1941 (A-43). These and other studies can be regarded as part of Hayek's work for a reconstruction of capital theory. His *Pure Theory of Capital* (B-5, 1941) was, to my knowledge, the first full treatise on capital since Böhm-Bawerk's *Positive Theory* and Irving Fisher's two volumes on interest theory. (Wicksell's analysis was part of more general economic studies.)

Hayek's *Pure Theory* appeared at a time when writers and teachers of economics were concerned with problems of unemployment, war finance, rationing, industrial organization, and government control of business; they

¹ Nicholas Kaldor, "Professor Hayek and the Concertina-Effect", *Economica*, November 1942, p. 359.

had no time and no inclination to concentrate on some of the most complex and difficult abstractions regarding a subject that did not seem to have any direct relevance to the "real" problems of the day. Indeed, most textbooks that appeared during and after World War II simply omitted the parts or chapters on capital theory that had been regarded as indispensable in earlier times and are now once more considered indispensable in the training of economists. Thus, Hayek's *Pure Theory* failed to excite or fascinate the economists as his writings had done ten years before. It is, however, my sincere conviction that this work contains some of the most penetrating thoughts on the subject that have ever been published.

I shall confine myself to listing a few of the themes to which this book has made most significant contributions. Hayek's construct of "intertemporal equilibrium" is presented in a refined form (pp. 22–25), as is his model of the interest rate as a ratio between the prices of the factors of production and the expected prices of their products in relation to the time interval between purchasing the former and selling the latter (p. 38). The problem of the "physical productivity of investment" is elucidated with remarkable clarity; the increase in the stream of outputs from given inputs in processes that require longer periods of investment is attributed to the combination of the inputs "with forces which could not be put to any use during the shorter period" (p. 72). The phenomena of natural growth and fermentation, and the use of materials, tools and accessories are described as a "vertical or successive division of labor" (p. 73).

The "period of investment" is analyzed for the four cases of "point input–point output", "continuous input–point output", "point input–continuous output", and "continuous input–continuous output" (pp. 67–69). The concept of an "average period of production" is replaced by that of a spectrum of different investment periods which are "incommensurable in purely technical terms" (p. 145). On this point I may, however, recall Wicksell's dictum that we ought to retain the concept as a "general principle" of heuristic value even if it is "without direct physical or psychic significance" (*Lectures*, Vol. I, p. 184). Hayek rejects also the concept of a "supply of capital" except as a complete enumeration of "all the alternative income streams between which the existence of a certain stock of non-permanent resources (together with the expected flow of input) enables us to choose" (p. 147). Nevertheless, after introducing the notion of the "force of interest" (in continuous compounding), Hayek arrives at an equilibrium position in which all rates of increase in all individual processes of production are equalized, exhibiting a determinate "marginal productivity of an investment" (p. 179). I mention only one more issue: that of "durable goods", where Hayek shows that equalization of marginal products comprises the choice between varying the durability of any individual good and varying the number of goods of given durability (p. 214).

In selecting the themes for this enumeration I have followed my preferences

as a teacher; others might have chosen different issues as the most noteworthy. As far as subsequent studies by other authors are concerned, I find most of them disappointing, partly because of their failure to proceed from where Hayek left off or to reconsider what may be in need of revision. An exception is the monograph by Robert Solow, which has added valuable insights and clarifications of these vexing problems.¹

Capital and Interest Revisited

Hayek never regarded his work as definitive. On at least two occasions he returned to problems of capital and interest: he reconsidered the relative roles of productivity and preference and he elucidated what he called the Ricardo Effect.

If the rate of interest is the rental paid for loanable funds, determined by supply and demand; if the net supply of such funds is ultimately determined by saving and, hence, by preferences of decision-makers regarding present and postponed consumption; if the demand for such funds is ultimately determined by investing and, hence, by the considerations of decision-makers regarding the productivity of using present inputs for the production of future outputs; and if the rate of interest, as observed over the years, is not drastically different over time but varies only within relatively narrow limits; should one attribute this relative stability to a property of the productivity functions or to a property of the preference functions? This question was answered differently in the literature: for example, Irving Fisher, Frank A. Fetter, and Ludwig von Mises, placed major emphasis on preference; whereas Knut Wicksell and Frank M. Knight stressed productivity.

Hayek tackled this question at least four times, first in a German article (A-5, 1927), later in a much more deeply probing article in English (A-32, 1936); afterwards in his *Pure Theory of Capital* (B-5, 1941); and once again in a brief note in English (A-56, 1945). He first sided with those who gave the predominant role to the productivity function and reached the following conclusion (A-32, p. 53):

While the process of saving still continues, the rate of interest will be determined solely by the productivity of investment . . . , and the psychical attitude will merely determine how much will have to be saved at every moment in order that the marginal rate of time-preference may adapt itself to the given and constant productivity rate.

The chief reason for this conclusion was that, for shorter income periods, "the indifference curve becomes more and more curved, while the transformation curve remains unchanged" (p. 56). Since, "compared with time-preference, the productivity of investment will always be comparatively constant," the latter exerts a stabilizing influence on the rate of interest (p. 55).

¹ Robert Solow, *Capital Theory and the Rate of Return* (Amsterdam, 1963).

Hayek retracted this conclusion in 1945 (A-56), because it applies only to the case of an “evenly progressive economy” and did not take account of regressive movements, “when the supply of capital decreases” or “falls short of the amount in the expectation of which previous investments have been made” (p. 24). In such a case there may be a movement along the productivity curve where it has a sharp bend—that is, where it is no longer a nearly straight line or only slightly concave—and there “time-preference takes charge” (p. 25). The new conclusion is that

so long as ‘time-preference’ remains constant or falls, the productivity element will be dominant; but whenever ‘time-preference’ rises, it takes control and we may get as a result sudden and violent increases in the marginal productivity of investment, and, in consequence, of the rate of interest.

The other revisited problem is that of the Ricardo Effect, first treated under that name in the essay that gave the title to his fourth book (B-4, 1939). Hayek later explained that, after Schumpeter and others had spoken of the “Hayek Effect”, he wanted to disclaim originality and to point to its real originator by renaming it “Ricardo Effect”. (Some critics, however, especially Kaldor, *op. cit.*, p. 364, have questioned Hayek’s interpretation of Ricardo’s proposition.) Hayek came back to the problem in a chapter of his *Pure Theory* and in an article published in 1942 (A-45), where he provided a revised exposition. Then, 27 years later, reacting chiefly to an interpretation by Hicks (which Hayek considered to be in error), Hayek published “Three Elucidations of the Ricardo Effect” (A-127, 1969).

The original proposition by Ricardo said that a rise in wages will encourage capitalists to substitute machinery for labour, and a fall in wages will make them substitute labour for capital. If real wages are seen as the ratio of factor prices to product prices, one can interpret a rise in product prices as a fall in factor prices. Hence, a rise in the prices of final output will, like a fall in wages, lead to the substitution of labour for capital, that is, a decline of investment in early stages of production.

This theme called for elucidation and Hayek provided it. To those who continue to hold that an increase in consumers’ demand must raise the demand for investment goods, he said (p. 284–85):

If it were true that an increase in the demand for consumer goods *always* leads to an increase in investment, even in a state of full employment, the consequence would be that the more urgently consumer goods are demanded the more their supply would fall off ... The mechanism which prevents such a result is the Ricardo Effect. And though its operation may not be obvious for a long time because of the more apparent monetary complications, and may even be altogether suspended as long as there is general unemployment, sooner or later it must reassert itself.

Socialism, Planning, and Competitive Capitalism

Under this heading I propose to survey Hayek’s writings on socialism, capitalism, planning, free markets, competition, and economic policy insofar as their

focus is on economic analysis. In a subsequent section I shall survey partly the same and partly other writings on economic systems and social institutions insofar as they focus on legal and political philosophy. This separation may occasionally do some violence to Hayek's argument but is justified from the point of view of the autonomy of the disciplines (though Gunnar Myrdal may object to that notion). Hayek explained his great interest in moral, legal, and political philosophy as that of

an economist who discovered that if he was to draw from his technical knowledge conclusions relevant to the public issues of our time, he had to make up his mind on many questions to which economics did not supply an answer. (From the Preface to *Studies in Philosophy, Politics, and Economics*, B-13, 1967, p. vii.)

Nevertheless, since we do not in this survey have to pass judgment on the desirability of public policies and institutions, we may try to separate contributions to technical economic analysis from clarification of the philosophical background that is required for moral judgment and political advice.

Economic Calculation for Socialist Planning

The problem of the possibility of rational economic calculations in planning under socialism had been raised and formulated by Ludwig von Mises in 1920, further elaborated in 1922, and defended against critics in 1924 and 1928. Hayek edited in 1935 two volumes on the subject: one entitled *Collectivist Economic Planning* (E-5) with essays by several authors, the other on *Economic Planning in Soviet Russia* by Boris Brutzkus (E-6). To the latter he contributed a preface, to the former two essays. In 1940, he published an article (A-41), chiefly to review books in which Oskar Lange and H. D. Dickinson presented "solutions" to the problem. Hayek later included his two essays and the article as chapters 7, 8 and 9 in his collection *Individualism and Economic Order* (B-7, 1948).

In the first of these essays, on "Socialist Calculation: The Nature and History of the Problem," Hayek gave a scholarly history and pre-history of the idea. He found some seeds in the writings of Gossen, Cannan, and Sulzer, and some seedlings in the writings of N. G. Pierson, Barone, and Neurath.

The second essay, "Socialist Calculation: The State of the Debate," went beyond the task which Hayek set himself in its title in that he added new issues to those already debated. The most important thought, the fact that "given" knowledge—of capacities, technologies, tastes—is not "concentrated anywhere in a single head" and not readily available for use "in the calculations of the central authority" (E-5, p. 155), appears here for the first time. (In later years Hayek made this thought the central theme of other publications.) Hayek distinguished the problems of assembling the data, setting up the equations, working out the results, making the decisions, and conveying them to those who have to execute them. He showed that to sacrifice the freedom of consumer's choice would simplify the problem but would not make it soluble

as long as somebody's aims or preferences, say, that of a dictator, are to be satisfied "with any degree of rationality or consistency" (*op. cit.*, p. 160). Anticipating Lange's "competitive solution," Hayek remarked that "only if competition exists not only *between* but also *within* the different industries can we expect it to serve its purpose" (p. 171). However, he conceded that the "impossibility" of finding a solution could not be proved and he expressed the hope that, "now that the world is moving in that direction," a rational system of resource allocation under socialism would be found after all (p. 180).

Hayek distinguishes five positions of socialist writers on the issue in question: (1) a nonposition, the original Marxian scorn for any attempt to go beyond the analysis of the laws of motion under capitalism and to anticipate what evolution might bring; (2) the position that consumers' preferences need not be obeyed and, therefore, that there is no problem about values, prices and costs; (3) the position that socialism should dispense with calculations in terms of value and calculate instead in terms of natural, physical units such as energy; (4) the position that calculation in terms of prices was indeed necessary, but their determination by market competition could be replaced by mathematical techniques with which the planning authorities would determine all values and quantities by means of a general-equilibrium model; and (5) the position that prices of consumer goods and of labour could be determined through competition in markets, all other prices fixed by a board in such a way that supply and demand are equated, and all quantities be decided by production managers committed to produce as cheaply as possible and to equate marginal costs to the fixed prices.

This last position is examined by Hayek in his "Socialist Calculation: The Competitive 'Solution'" (A-41 and B-7, Ch. 9). Hayek had anticipated in his second essay much of what Lange in 1938 and Dickinson in 1939 proposed, but now that these proposals were on the table he could probe their practicality as well as their internal consistency. Much of what Hayek had to say about the difficulties that would complicate or frustrate the operation of the proposed "market socialism" has in later years been learned by experience and observed in practice by leaders of economic reform movements in Hungary, Czechoslovakia, and Poland. The problems which Hayek found insoluble are still unsolved, and the makeshifts which he judged to be inferior or unworkable are still in an admittedly unsatisfactory state. The accepted aim is decentralization of decision-making, but the questions of costing, pricing, responsibility, risk-taking, incentives, testing for success and failure, investment decisions, and all the rest are still waiting for any more acceptable answers than Hayek considered possible.

In his final appraisal of the plans for market socialism Hayek expresses the fear (B-7, p. 208) that the proposed schemes

are so thoroughly unorthodox from a socialist point of view that one rather wonders whether their authors have not retained too little of the traditional trappings of

socialist argument to make their proposals acceptable to socialists who are not economists.

Twenty-eight years after these words were published, a group of dedicated socialists trying to decentralize the system and make it more liberal, more productive, and more humane, learned to their distress, shared by most of the intellectual world, that Hayek's fears had been justified.

Planning, Competition, and the Use of Knowledge

One of the most original and most important ideas advanced by Hayek is the role of the "division of knowledge" in economic society. He devoted to this problem two articles (A-34, 1937, and A-55, 1945), both of which are included in his 1948 volume of essays (B-7, Chs. 2 and 4). I shall use direct quotation rather than paraphrase to bring out the major points:

The really central problem of economics as a social science . . . is how the spontaneous interaction of a number of people, each possessing only bits of knowledge, brings about a state of affairs . . . which could be brought about by deliberate direction only by somebody who possessed the combined knowledge of all these individuals (B-7, p. 51). How can the combination of fragments of knowledge existing in different minds bring about results which, if they were to be brought about deliberately, would require a knowledge on the part of the directing mind which no single mind can possess? (p. 54.) Planning in the specific sense in which the term is used in contemporary controversy necessarily means central planning — direction of the whole economic system according to one unified plan: Competition, on the other hand, means decentralized planning by many separate persons . . . Which of these systems is likely to be more efficient depends mainly on the question under which of them we can expect that fuller use will be made of the existing knowledge. This, in turn, depends on whether we are more likely to succeed in putting at the disposal of a single central authority all the knowledge which ought to be used but which is initially dispersed among many different individuals, or in conveying to the individuals such additional knowledge as they need in order to enable them to dovetail their plans with those of others. (p. 79.)

What matters in this connection is not scientific knowledge but the unorganized "knowledge of the particular circumstances of time and place"; practically every individual "possesses unique information of which beneficial use might be made" (p. 80), but which "cannot be conveyed to any central authority in statistical form . . . Central planning . . . cannot take direct account of these circumstances of time and place" and "decisions depending on them" must be "left to the 'man on the spot'" (p. 83). "We need decentralization because only thus can we insure that the knowledge of the particular circumstances . . . will be promptly used" (p. 84).

"Fundamentally, in a system in which the knowledge of the relevant facts is dispersed among many people, prices can act to co-ordinate the separate actions of different people . . ." (p. 85). The price system is "a mechanism for communicating information" and "the most significant fact about this system is the economy of knowledge with which it operates" (p. 86). The problem is not that a unique solution *could* be derived from a complete set of "data,"

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but that "we must show how a solution is produced by the interaction of people each of whom possesses only partial knowledge" (p. 91).

Competition and Free Enterprise

In two papers first published in the collection of essays (B-7, Chs. 5 and 6) Hayek examines the role of competition in a capitalist economy. He criticizes modern micro-economic theory, especially the theories of the firm and of the industry, for their preoccupation with static analysis of models of pure and perfect competition and for their scant attention to competition as a dynamic process (p. 94).

For Hayek the important problem lies in attempts "to discover new ways of doing things better than they have been done before" (p. 101); "the argument in favor of competition does not rest on the conditions that would exist if it were perfect" (p. 104). For the social benefits from competition are unimportant; what matters are instances "where competition is deliberately suppressed" (p. 105).

Those who know Hayek as a dedicated "libertarian" may be surprised about his condemnation of a tradition which held that "with the recognition of the principles of private property and freedom of contract ... all the issues were settled, as if the law of property and contracts were given once and for all in its final and most appropriate form, i.e., in the form which will make the market economy work at its best" (p. 111). Hayek has harsh things to say about the uses of the freedom of contract by which the "competitive order" is transformed into its opposite, "ordered competition" (p. 111). He seriously questions "the extension of the concept of property to such rights and privileges as patents for inventions, copyright, trade-marks, and the like" (pp. 113-14). Similarly, he questions the extension of "the freedom of the individual ... to organized groups of individuals" and the extension of "the rights of a natural person" to "corporations as fictitious or legal persons" (p. 116). In all these matters the present legal framework may be inappropriate to the objective of making competition more effective.

In subsequent years Hayek devoted more analysis to these problems. With the problem of the corporation, its rights, powers, and economic consequences, he dealt in two articles (A-71, 1951, and A-98, 1960). The problem of trade unions, their rights, powers, and economic consequences, was the subject of two articles (A-84, 1958, and A-91, 1959) as well as a significant chapter in his work on *The Constitution of Liberty* (B-12, 1960, Ch. 18). A special subject, taxation, especially for redistributive purposes, was treated in papers (A-73, 1952, and A-79, 1956) and in a chapter of the volume just mentioned (B-12, Ch. 20). This large volume contains also chapters on social security, the monetary framework, housing and town planning, agriculture and natural resources, and education and research. Because these chapters were part of a work on legal and political philosophy they have not received much attention from economists.

Legal and Political Philosophy

In one of his many philosophical papers—on “Kinds of Rationalism” (A-112, 1965, p. 9)—Hayek feels compelled to explain why he, “at one time a very pure and narrow economic theorist, was led from technical economics into all kinds of questions usually regarded as philosophical.” He tells that he was searching for more adequate

insight into the relations between the abstract rules which the individual follows in his actions, and the abstract overall order which is formed as a result of his responding to the concrete particular circumstances which he encounters, within the limits imposed upon him by those abstract rules. It was only through a re-examination of the age-old concept of freedom under the law . . . and of the problems of the philosophy of law which this raises, that I have reached what now seems to me a tolerably clear picture of the nature of the spontaneous order of which liberal economists have so long been talking.

In order to comprehend better how “the man-made rules and the spontaneous forces of society interact,” we need “a much closer collaboration between the specialists in economics, law, and social philosophy than we have had . . .”.

Hayek’s writings on legal and political philosophy account for a substantial share in the number of his publications. Nevertheless, the present review of his work is predominantly concerned with Hayek the economist and will therefore be confined to little more than a selective listing, and occasionally the academic reception, of his contributions to the philosophy of law and politics.

Freedom and the Economic System

Hayek’s first publication directed to this subject, under the title I have chosen for this subsection, was a pamphlet published in 1939 (P-2). It was followed by a brief note in *Nature* (A-44, 1941), addressed chiefly to natural scientists. Then came the book that became a bestseller in many countries, *The Road to Serfdom* (B-6, 1944). It was published in three English editions and translated into ten foreign languages. It aroused heated discussions, was lavishly praised and roundly panned by the critics according to their own political stance; and the prediction of one reviewer, Joseph J. Spengler, came true: that “Hayek’s views will probably be distorted by Right and Left.”¹ I should like to quote from the reviews of a small sample of respected economists.

A. C. Pigou called it “a scholarly and sincere book”² and believed that few scholars will “close the book without a feeling of respect for and sympathy with the writer”.³ Aaron Director held that “economists should be grateful to Professor Hayek” for his explorations of “the ultimate political implications of abandoning the competitive system. There is no economist writing in

¹ *Southern Economic Journal*, Vol. 12, 1945, p. 51.

² *The Economic Journal*, Vol. 54, 1944, p. 217.

³ *Ibid.*, p. 219.

English more eminently qualified to do this job".¹ Joseph Schumpeter called it

a courageous book: sincerity that scorns camouflage and never minces matters is its outstanding feature from beginning to end. Finally, it is also a polite book that hardly ever attributes to opponents anything beyond intellectual error.

With regard to the concluding chapters of the book, Schumpeter expects that "the reader will be glad to have the views of one of the most eminent economists of our time".²

Liberty and the Law

The Road to Serfdom did not satisfy Hayek's scholarly standards. He submerged himself into the study of social, political, and legal philosophy, and provisional fruits of this effort became available in the form of articles and essays (A-74, 1953; A-78, 1955; A-87 and 88, 1958; A-89, 92, and 93, 1959) and a small book with the title *The Political Ideal of the Rule of Law* (B-11, 1955). All this was preparatory to a volume which some of Hayek's admirers regard as his chef-d'oeuvre, *The Constitution of Liberty* (B-12, 1960, x and 570 pages).

Some of the chapters on economic institutions and policies have been mentioned before; the parts concerned with philosophical problems and jurisprudence remain to be described, but even this we shall suppress in favour of quoting from a review article by Lord Robbins,³ so that we can get an appraisal from an eminent economist and historian of ideas:

the recognition of an order in society which has not been planned as a totality is clearly fundamental; and never has the pathbreaking significance of the great eighteenth century discoveries in this respect been better set forth than in Professor Hayek's luminous exposition, itself the source of many new insights. As he develops the conception of a spontaneous organization which is not only a sorting out of comparative aptitudes and technical advantages, but also a means of utilizing and developing a heritage of knowledge never capable of being grasped as a whole by any of the participants in the process, the time-honoured theme of the advantages of the division of labour assumes a new aspect; and propositions that have been repeated more or less parrot-wise for a hundred and fifty years acquire a meaning and depth seldom before realized. I would venture to pick this out, together with his earlier papers on similar topics, as one of Professor Hayek's most enduring contributions to our subject.

Robbins concludes with a vote of gratitude and admiration, "gratitude for a splendid contribution to the great debate, admiration for the moral ardour and intellectual power which inspired it and made it possible".

This great work done, Hayek did not rest. He could not let go of a topic on which he found so much more to do. In an article in German (A-100, 1961) he asks why it is that personal liberty is in continual jeopardy and why the

¹ *The American Economic Review*, Vol. 35, 1945, pp. 173-174.

² *Journal of Political Economy*, Vol. 54, 1946, p. 269.

³ "Hayek on Liberty," *Economica*, February 1961, pp. 66-81. The quotations are from pp. 69-70 and 81.

trend is toward its being increasingly restricted. The cause of liberty, he finds, rests on our awareness that our knowledge is inevitably limited. The purpose of liberty is to afford us an opportunity to obtain something unforeseeable; since it cannot be known what use individuals will make of their freedom, it is all the more important to grant freedom to everybody (p. 103). Liberty can endure only if it is defended not just when it is recognized to be useful in particular instances but rather continuously as a fundamental principle which may not be breached for the sake of any definite advantages obtainable at the cost of its suspension (p. 105). It is not easy to convince the masses that they should sacrifice foreseeable benefits for unforeseeable ones.

This piece was followed by a number of small ones, some in German (A-105 and A-106, 1963; A-111, 1965; and A-120, 1967), some in English (A-114, 1966; A-115, 1967; and A-121 and A-123, 1968), in which Hayek added many new nuances to his ideas, and several novel thoughts on liberty and the legal and social order. In "The Principles of a Liberal Social Order" (A-115) Hayek made some useful semantic remarks about the difference between liberalism and democracy (and their opposites, totalitarianism and authoritarianism), the former indicating the extent, the latter the site of governmental power. Of interest is the idea of defining an economy as a decision-making unit, and thus to deny this designation to the totality or "catallaxy" of independent individual "economies" in a community or nation; socialism transforms a catallaxy into an economy. In the same article he proposes that "the basic principles of a liberal society may be summed up by saying that in such a society all coercive functions of government must be guided by the overruling importance of what I like to call *the three great negatives: peace, justice, and liberty*".

In "The Constitution of a Liberal State" (A-121, 1967) Hayek offers ideas for radical changes on the separation of powers in democratic society. He attributes the influence of pressure groups favoring the interests of particular groups or individuals to the fact that the same legislative assembly has both the power of making general laws and the power of directing the government in providing services of all sorts. "A legislative assembly confined to the articulation of universally applicable rules of just conduct whose effects on particular individuals or groups would be unforeseeable, would not be under such pressure." Hayek, therefore, proposes "two distinct representative assemblies," charged with altogether different tasks. I must resist the temptation of mentioning, let alone discussing, the numerous ways of democratic reform proposed by Hayek.

History of Ideas

Hayek is recognized as one of the most scholarly, most erudite, and most interesting historians of ideas in economics as well as in legal, political, and

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social philosophy. His list of publications in this area includes 24 articles and essays on individual writers; five or six comprehensive surveys of schools of thought and intellectual movements; one book (on John Stuart Mill and Harriet Taylor); and five books of major economists which he edited or introduced; in addition, several of his topical books contain large chunks that are devoted to presentations of the history of the ideas with which Hayek is concerned at the moment. I have briefly commented on this in connection with Hayek's work on the theories of money, capital, and the trade cycle.

Men's Lives, Works, and Thoughts

On some of the great writers of the past Hayek wrote complete biographies with careful discussions of their works and seminal thoughts. On some he prepared obituaries but even these are much more scholarly than what ordinarily goes under that name. With regard to others, Hayek was not concerned with either their lives or their complete works but only with particular ideas of theirs. Finally, there are some very important authors whose correspondence with contemporaries, whose views on others' writings, or whose influence on later writers are the subjects of Hayek's scholarship.

The writer who figures in all of these categories is John Stuart Mill. Hayek contributed an introduction to Mill's *Spirit of the Age* (E-9, 1942), edited Mill's correspondence with John Rae (A-52, 1943), edited Mill's notes on Senior's work (A-57, 1945), wrote an introduction to his *Earlier Letters* (A-107, 1963), and published the book on John Stuart Mill and Harriet Taylor (B-8, 1951).

Writers in the category "ideas only" include David Hume (A-108, 1963; B-11, B-12, B-13); Comte and Hegel (A-70, 1951) and the physicist Ernst Mach (A-119, 1967). Encyclopedia articles are devoted to Hermann Gossen, Henry Macleod, George W. Norman, Eugen v. Philippovich (*Encyclopaedia of the Social Sciences*), David Ricardo (*Chambers'*), Bernard Mandeville (*Handwörterbuch*) and Carl Menger (*International Encyclopedia of the Social Sciences*). The lives and works of some of these writers were also treated by Hayek in other publications: Gossen in a book edited by Hayek (E-1, 1927), Menger in a well-known article (A-25, 1934), and Mandeville in an address to the British Academy (A-116, 1966). Others whom Hayek treated biographically include Friedrich von Wieser in an introduction to his collected essays (E-2, 1929) and in an article (A-4, 1926); Richard Cantillon (E-3, 1931) and Henry Thornton (E-8, 1939) in introductions to works of theirs; Richard v. Strigl, Wesley Clair Mitchell, and Bruno Leoni in obituary articles (A-54, 1944, A-64, 1948, and A-122, 1968).

The Austrian School was treated by Hayek in two articles for encyclopedias (A-103, 1962, and A-124, 1968), but a much more detailed treatment was given to the French Ecole Polytechnique, especially Saint-Simon and Auguste Comte, in an article in three parts under the title "The Counter-Revolution of Science" (A-42, 1941). This study (of over 100 printed pages) succeeded in

showing a scientific movement of the past in an altogether new light; it was reprinted as a book (B-9) and appeared also in an abridged translation in French (1953) and in a complete translation in German (1959).

Intellectual History Embodied in Every Treatise

It would not be possible in the present review to enumerate the instances in which Hayek presented the histories of particular ideas in his various articles and books in legal, political and social philosophy as well as in economics. Perhaps, however, I should mention a few of the great thinkers or schools of thought whose views Hayek analyzed in the context of his learned discourses: Descartes, the French Enlightenment, especially d'Alembert and Condorcet, Rousseau, the Physiocrats, Adam Smith, Bentham and the English Utilitarians, Lord Acton, de Tocqueville, Burke, and Locke.

An Essay in Psychology

The record of Hayek's work would be incomplete if it failed to include mention of a book of his in the field of psychology. I have no competence in this field and cannot arrogate to myself the right to pass judgment on this work.

It appeared in 1952 under the title *The Sensory Order* (B-10). The book was reviewed with respect and partial acclaim by eminent psychologists, e. g., Edwin G. Boring (*The Scientific Monthly*, March 1953, pp. 182-183), but, as far as I know, it has not had much influence on professional psychologists.

Philosophy of Science

Hayek's concern with philosophy of science in general and methodological problems of the social sciences in particular derived from his dissatisfaction with the assertions and prescriptions of social scientists regarding the "right" methods of inquiry. There were, on the one hand, those who thought that the methods of the natural sciences, especially physics, should be imitated in the social sciences; on the other hand, there were those who denied economics the status of a "science" and wanted its investigations to employ the working methods of the historians. As Hayek attempted to sort out and analyze the methodological problems of the social sciences, he found it necessary to become himself a philosopher of science.

Much of Hayek's thinking in this area is contained in his books and articles on substantive problems or on intellectual history. For example, while I chose to include his long essay on "The Counter-Revolution of Science" (A-42, 1941), among his work on history of ideas, one might with almost equal justification include it under the heading of philosophy of science. An even earlier publication, "Economics and Knowledge" (A-34, 1937), which I mentioned in the section on Socialism, Planning, and Competitive Capitalism, contains highly significant methodological suggestions. But instead of culling

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Hayek's ideas on the philosophy of science from a variety of his writings, I shall concentrate here on the essays and articles that are primarily or exclusively devoted to it.

Critique of Scientism

His first major essay in this category is on "Scientism and the Study of Society" (A-46, 1942–1944), a critique of the "slavish imitation of the method and language of Science" (i.e., natural sciences) in the study of society. To guard against misunderstandings, Hayek assures us that his criticisms are not aimed "against the methods of Science in their proper sphere" or "to throw the slightest doubt on their value". He adds that "the scientistic as distinguished from the scientific view is ... a very prejudiced approach which, before it has considered its subject, claims to know what is the most appropriate way of investigating it" (p. 269). The pejorative term "scientism" had been used in French writings, as Hayek tells us with supporting documentation.

In the preface to his book of collected essays, *Studies in Philosophy, Politics, and Economics* (B-13, 1967), Hayek calls attention (p. viii) to

a slight change in the tone of my discussion of the attitude which I then called 'scientism'. The reason for this is that Sir Karl Popper has taught me that natural scientists did not really do what most of them not only told us that they did but also urged the representatives of other disciplines to imitate. The difference between the two groups of disciplines has thereby been greatly narrowed and I keep up the argument only because so many social scientists are still trying to imitate what they wrongly believe to be the methods of the natural sciences.

The essay of "Scientism" gives a clear account of the reasons why some of the rules of procedure claimed to be those of Science are inapplicable, or applicable only after appropriate modification, to the study of social phenomena. There is first the recognition that the "facts" of the social sciences are "opinions—not opinions of the student of social phenomena, of course, but opinions of those whose actions produce his object". Moreover, we cannot "observe" these opinions—our data—directly "in the minds of the people but [only] recognize [them] from what they do and say merely because we have ourselves a mind similar to theirs" (A-46, p. 279). Examples: sentences, crime, punishment, medicine, cosmetic, commodity, economic good, money, exchange, games, rent, scarcity, utility, price, cost, profit, etc., are all "opinions" of people. Hayek stresses the contrast "between ideas which by being held by the people become the causes of a social phenomenon and the ideas which people form about that phenomenon" (p. 285).

A thought which Hayek elaborates also in other contexts is formulated here with great clarity (p. 288):

If social phenomena showed no order except insofar as they were consciously designed, there would indeed be no room for theoretical sciences of society and there would be, as is often argued, only problems of psychology. It is only in so far as some sort of order arises as a result of individual action but without being

designed by any individual that a problem is raised which demands a theoretical explanation.

The difficulty with such "order" or "regularity" is that it "cannot be stated in physical terms, that if we define the elements in physical terms no such order is visible, and that the units which show an orderly arrangement do not (or at least need not) have any physical properties in common ..."

Hayek makes a "distinction between an explanation merely of the principle on which a phenomenon is produced and an explanation which enables us to predict the precise results" (p. 290) and, as an illustration of the former, he refers to "a set of equations which shows merely the form of a system of relationships but does not give the values of the constants contained in it" (p. 291).

I am tempted to quote many of Hayek's statements on behaviorism and physicalism; on attempts to explain mental processes by physical ones; on social wholes, which are not observable but are constructions of our minds to schematize supposed structures of relationships among selected actions and events; on the nature of statistical studies of social phenomena; on the claims and failures of historicism; on the complementarity between theoretical and historical work; on alleged laws of historical change and development; and on many other methodological problems with which he deals in this essay. I must not yield to this temptation or this review will be far too long.

Hayek's distinction between scientific and scientistic attitudes has been widely accepted. More than 25 years after the publication of this lengthy essay, he was asked to write an article on "scientism" for a German encyclopedia of sociology (A-126, 1969).

Explanation, Prediction, and Specialization

Between 1943 and 1969 Hayek published another eleven essays in philosophy of science, seven in English, three in German, and one in French. Six of these essays were collected in his book of *Studies in Philosophy, Politics and Economics* (B-13, 1967). They were on "Degrees of Explanation" (A-76, 1955), "The Dilemma of Specialization" (A-80, 1956), "Rules, Perception and Intelligibility" (A-102, 1962), "The Theory of Complex Phenomena" (A-109, 1964), "Kinds of Rationalism" (A-112, 1965), and "The Results of Human Action but Not of Human Design" (A-118, 1967).

In the first of these essays, Hayek distinguishes positive and negative predictions, with those of disjunctive alternatives between the two. He stresses the difficulty, in as complex situations as economics presents, "that we are unable to ascertain by observation the presence and specific arrangement of the multiplicity of factors which form the starting point of our deductive reasoning" (A-76, p. 216). Falsification of a theory is not thereby excluded: Our tentative explanation will thus tell us what *kinds* of events to expect and which not, and it can be proved false if the phenomena observed show characteristics which the postulated mechanism could not produce.

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But, in contrast with

the supposedly normal procedure of physics ... we do here not *invent* new hypotheses or constructs but merely *select* them from what we know already about some of the elements of the phenomena; in consequence we do not ask whether the hypotheses we used are true or whether the constructs are appropriate, but whether the factors we have singled out are in fact present in the particular phenomena we want to explain, and whether they are relevant and sufficient to explain what we observe.

In lieu of offering more quotations, attention may be called to Hayek's discussion of various issues of interest to particular groups of readers: illustrations of "explanations of the principle" (in contrast with explanations of particular observations), especially with reference to the theory of evolution by natural selection (pp. 218–220); the use of models for the explanation of "ranges of phenomena" and the problems of refuting their relevance, especially if they yield mostly "negative predictions" (pp. 220–224); the importance of "orientation" where prediction is not possible, and of "cultivation" where control is beyond our capacity (p. 225).

A few valuable insights may be presented here from Hayek's "Dilemma of Specialization" (A-80, 1956). He discusses the differences in the significance to different fields of inquiry of the "concrete and particular as against the general and theoretical" (p. 463), and the consequences of "exclusive concentration on a specialty":

The physicist who is only a physicist can still be a first-class physicist and a most valuable member of society. But nobody can be a great economist who is only an economist—and I am even tempted to add that the economist who is only an economist is likely to become a nuisance if not a positive danger.

And (p. 464)

The degree of abstraction which the theoretical disciplines in our field requires makes them at least as theoretical, if not more so, than any in the natural sciences. This, however, is precisely the source of our difficulty. Not only is the individual concrete instance much more important to us than it is in the natural sciences, but the way from the theoretical construction to the explanation of the particular is also much longer.

Furthermore (p. 465),

most successful research work will require a very particular combination of diverse kinds of knowledge and accomplishments, and it may take half a lifetime until we are better than amateurs in three-quarters of the knowledge demanded by the task we have set ourselves.

Unfortunately (p. 465), "not every legitimate research specialty is equally suitable as a scientific education." Hayek concludes (pp. 469–70) that in economics

we do not know as sharp a division between the theoretician and the practitioner as there exists between the physicist and the engineer or between the physiologist and the doctor. This is not an accident or merely an earlier stage of development

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but a necessary consequence of the nature of our subject. It is due to the fact that the task of recognizing the presence in the real world of the conditions corresponding to the various assumptions of our theoretical schemes is often more difficult than the theory itself, an art which only those will acquire to whom the theoretical schemes have become second nature ... We can, therefore, only rarely delegate the application of our knowledge but must be our own practitioners, doctors as well as physiologists.

Action and Perception

Of the essay on "Rules, Perception and Intelligibility" (A-102, 1962) I shall only draw attention to Hayek's important observations on "rule-guided action" and "rule-guided perception", neither of which presupposes that we can state or describe the rules that guide our actions and perceptions. I should like to make Hayek's statements of these issues required reading for any one who undertakes to talk or write about the methodology of the social sciences.

The theme of the existence of subconscious rules that guide perception is further elaborated in a brief essay on "The Primacy of the Abstract" (A-128, 1969). Here Hayek defends the proposition that perception of the concrete presupposes an organizing capacity of the mind; this is what he means by "primacy of the abstract". Hayek refers to the well-established fact that "most animals recognize ... abstract features long before they can identify particulars". He goes back to the writings of many important authors, from Adam Ferguson (1767) through Immanuel Kant and C. S. Peirce to quite recent psychologists, zoologists, and ethologists, to show that this recognition, although it contradicts a common textbook-lesson, has been of rather old vintage, forgotten or disregarded by the believers in the primary of the concrete.

Final Assessment

Where do Hayek's greatest achievements lie? Any judgment of this sort will reflect the appraiser's personal interests and tastes, especially in the case of a scholar like Hayek whose work has been on so large a variety of subjects in several fields. We can make our assessment somewhat easier if we confine ourselves to Hayek's contributions to Economic Science.

There is still the choice among at least three or four possibilities: the theory of economic fluctuations; the pure theory of capital; the theory of economic planning under socialism and competitive capitalism; and the methodology of economics. If I had to single out the area in which Hayek's contributions were the most fundamental and pathbreaking, I would cast my vote for the theory of capital. As I said before, when I reviewed Hayek's book on *The Pure of Theory of Capital*, it is "my sincere conviction that this work contains some of the most penetrating thoughts on the subject that have ever been published".

If two achievements may be named, I would add Hayek's contributions to

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the theory of economic planning. Most of what has been written on systems analysis, computerized data processing, simulation of market processes, and other techniques of decision-making without the aid of competitive markets, appears shallow and superficial in the light of Hayek's analysis of the "division of knowledge," its dispersion among masses of people. Information in the minds of millions of people is not available to any central body or any group of decision-makers who have to determine prices, employment, production, and investment but do not have the signals provided by a competitive market mechanism. Most plans for economic reform in the socialist countries seem to be coming closer to the realization that increasing decentralization of decision-making is needed to solve the problems of rational economic planning.

BIBLIOGRAPHY

Books

- B-1. *Geldtheorie und Konjunkturtheorie*, Vienna and Leipzig, 1928, xii, 147 pp. English edition, 1933. Japanese edition, 1935. Spanish edition, 1936.
- B-2. *Prices and Production*, London, 1931, xv, 112 pp., 2nd revised and enlarged edition, London, 1935, xiv, 162 pp. Austrian edition, 1931. Japanese edition, 1934.
- B-3. *Monetary Nationalism and International Stability*, Geneva, 1937, xiv, 94 pp. American edition, 1974.
- B-4. *Profits, Interest and Investment*, London, 1939, viii, 266 pp.
- B-5. *The Pure Theory of Capital*, London, 1941, xxxi, 454 pp. Spanish edition, 1946. Japanese edition, 1952.
- B-6. *The Road to Serfdom*, London and Chicago, 1944, 250 pp. Austrian edition, 1944. Swedish edition, 1944. French edition, 1945. German edition, 1945. Danish edition, 1946. Portuguese edition, 1946. Spanish edition, 1946. Netherlandish edition, 1948. Norwegian edition, 1949. Japanese edition, 1954. Chinese edition, 1956.
- B-7. *Individualism and Economic Order*, London and Chicago, 1948, vii, 271 pp. German edition, 1952.
- B-8. *John Stuart Mill and Harriet Taylor*, London and Chicago, 1951, 320 pp.
- B-9. *The Counter-Revolution of Science*, Glencoe Ill., 1952, 255 pp. German edition, 1959. French excerpts, 1953.
- B-10. *The Sensory Order*, London and Chicago, 1952, xxii, 209 pp.
- B-11. *The Political Ideal of the Rule of Law*, Cairo, 1955, 60 pp.
- B-12. *The Constitution of Liberty*, London and Chicago, 1960, x, 569 pp.
- B-13. *Studies in Philosophy, Politics and Economics*, London and Chicago, 1967, x, 356 pp.
- B-14. *Freiburger Studien. Gesammelte Aufsätze*, Tübingen, 1969, 284 pp.
- B-15. *Law, Legislation, and Liberty*, Vol. 1, Rules and Order, Chicago, 1973, xi, 184 pp.

Pamphlets

- P-1. *Das Mieterschutzproblem, Nationalökonomische Betrachtungen*, Vienna, 1928.

Swed. J. of Economics 1974

- P-2. *Freedom and the Economic System*, Chicago, 1939, iv, 37 pp.
 P-3. *The Case of the Tyrol*, London, 1944.
 P-4. *Reports on the Changes in the Cost of Living in Gibraltar 1939–1944 and on Wages and Salaries*, Gibraltar, no date (1945).
 P-5. *Individualism? True and False*, Dublin, 1946, 38 pp.
 P-6. *Wirtschaft, Wissenschaft und Politik*, Freiburg, 1963, 24 pp.
 P-7. *Was der Goldwahrung geschehen ist. Ein Bericht aus dem Jahre 1932 mit zwei Erganzungen*. (Walter Eucken Institut: Vortrage und Aufsatze, 12), Tubingen, 1965, 33 pp.
 P-8. *The Confusion of Language in Political Thought, With Some Suggestions for Remedying It* (Institute of Economic Affairs, Occasional Paper 20), London, 1968, 36 pp.
 P-9. *Der Wettbewerb als Entdeckungsverfahren*, Kiel, 1968, 20 pp.
 P-10. *Economic Freedom and Representative Government*. Fourth Wincott memorial lecture delivered at the Royal Society of Arts, 31 Oct. 1973. London, 1973, 22 pp.

Books Edited or Introduced

- E-1. Gossen, H. H., *Entwicklung der Gesetze des menschlichen Verkehrs*, 3rd ed., Berlin, 1927, xxiii, 278 pp. Introduction by F.A.H.
 E-2. Wieser, Friedrich Freiherr von, *Gesammelte Abhandlungen*, Tubingen, 1929, xxxiv, 404 pp. Edited with an introduction by F.A.H.
 E-3. Cantillon, Richard, *Abhandlung uber die Natur des Handels im Allgemeinen* (translated by Hella von Hayek), Jena, 1931, xix, 207 pp. Introduction and annotations by F.A.H.
 E-4. *Beitrage zur Geldtheorie* (by Marco Fanno, Marius W. Holtrop, Johan G. Koopmans, Gunnar Myrdal, Knut Wicksell). Vienna, 1931, ix, 511 pp. Edited and Preface by F.A.H.
 E-5. *Collectivist Economic Planning*, London, 1935, v, 293 pp. Edited with introductory and concluding chapters by F.A.H. (France, 1939, Italy, 1946).
 E-6. Brutzkus, Boris, *Economic Planning in Soviet Russia*, London, 1935, xvii, 234 pp. Edited with a Preface by F.A.H.
 E-7. *The Collected Works of Carl Menger*, 4 vols., London, 1934–1936. Introduction by F.A.H. German edition: Carl Menger, *Gesammelte Werke*, Tubingen, 1968 *et seq.* Edited and introduced by F.A.H.
 E-8. Thornton, Henry, *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain* (1802), London, 1939, 368 pp. Edited with an Introduction by F.A.H.
 E-9. John Stuart Mill, *The Spirit of the Age*, Chicago, 1942, xxxiii, 93 pp. Introduction by F.A.H.
 E-10. *Capitalism and the Historians*, London and Chicago, 1954, 188 pp. Edited with an Introduction by F.A.H.

Articles in Learned Journals or Collections of Essays

- A-1. ‘Das Stabilisierungsproblem in Goldwahrungslandern’, *Zeitschrift fur Volkswirtschaft und Sozialpolitik*, N.S. 4 (1924).
 A-2. ‘Die Wahrungspolitik der Vereinigten Staaten seit der Uberwindung der Krise von 1920’, *Zeitschrift fur Volkswirtschaft und Sozialpolitik*, N.S. 5 (1925).
 A-3. ‘Bemerkungen zum Zurechnungsproblem’, *Jahrbucher fur Nationalokonomie und Statistik*, 124 (1926).

- A-4. 'Wieser, Friedrich Freiherr von', *Jahrbücher für Nationalökonomie und Statistik*, 125 (1926).
- A-5. 'Zur Problemstellung der Zinstheorie', *Archiv für Sozialwissenschaften und Sozialpolitik*, 58 (1927).
- A-6. 'Das intertemporale Gleichgewichtssystem der Preise und die Bewegungen des Geldwertes', *Weltwirtschaftliches Archiv*, 28 (1928).
- A-7. 'Einige Bemerkungen über das Verhältnis der Geldtheorie zur Konjunkturtheorie', *Schriften des Vereins für Socialpolitik*, 173/2 (1928); also discussion, *loc. cit.*, 175 (1928).
- A-8. 'Theorie der Preistaxen' (in Hungarian; reprint in German), *Häzgasdasagi Enciclopedia*, Budapest, 1929.
- A-9. 'Gibt es einen Widersinn des Sparens?', *Zeitschrift für Nationalökonomie*, 1 (1929)—English: 'The paradox of saving', *Economica*, 11 (1931).
- A-10. 'Reflections on the Pure Theory of Money of Mr. J. M. Keynes', *Economica*, 11 (1931) and 12 (1932).
- A-11. 'The Pure Theory of Money: A Rejoinder to Mr. Keynes', *Economica*, 11 (1931).
- A-12. 'Money and Capital: A Reply to Mr. Sraffa', *Economic Journal*, 42 (1932).
- A-13. 'Kapitalaufzehrung', *Weltwirtschaftliches Archiv*, 36 (1932/II).
- A-14. 'A Note on the Development of the Doctrine of "Forced Saving"', *Quarterly Journal of Economics*, 47 (1932).
- A-15. 'Hermann Heinrich Gossen', *Encyclopaedia of the Social Sciences*, vol. VI, New York, 1932.
- A-16. 'Henry D. Macleod', *Encyclopaedia of the Social Sciences*, vol. X, New York, 1935.
- A-17. 'George W. Norman', *Encyclopaedia of the Social Sciences*, vol. XI, New York, 1933.
- A-18. 'Eugen von Philippovich', *Encyclopaedia of the Social Sciences*, vol. XII, New York, 1934.
- A-19. 'Saving', *Encyclopaedia of the Social Sciences*, vol. XIII, New York, 1934.
- A-20. 'The Trend of Economic Thinking', *Economica*, 13 (1933).
- A-21. Contribution to: *Der Stand und die nächste Zukunft der Konjunkturforschung. Festschrift für Arthur Spiethoff*, Munich, 1933.
- A-22. 'Über "Neutrales Geld"', *Zeitschrift für Nationalökonomie*, 4 (1933).
- A-23. 'Capital and Industrial Fluctuations', *Econometrica*, 2 (1934).
- A-24. 'On the Relationship between Investment and Output', *Economic Journal*, 44 (1934).
- A-25. 'Carl Menger', *Economica*, N.S. 1 (1934).
- A-26. 'Preiserwartungen, Monetäre Störungen und Fehlinvestitionen', *National-ökonomisk Tidskrift*, 73 (1935).
- A-27. 'The Maintenance of Capital', *Economica*, N.S. 2 (1935).
- A-28. 'Spor między szkola "Currency" i szkola "Banking"', *Ekonomista* (Warsaw), 55 (1935).
- A-29. 'Edwin Cannan' (obituary), *Zeitschrift für Nationalökonomie*, 6 (1935).
- A-30. 'Technischer Fortschritt und Überkapazität', *Österreichische Zeitschrift für Bankwesen*, 1 (1936).
- A-31. 'The Mythology of Capital', *Quarterly Journal of Economics*, 50 (1936).
- A-32. 'Utility Analysis and Interest', *Economic Journal*, 46 (1936).
- A-33. 'La situation monétaire internationale', *Bulletin Periodique de la Societé Belge d'Etudes et d'Expansion*, (1936).
- A-34. 'Economics and Knowledge', *Economica*, N.S. 4 (1937).

- A-35. 'Einleitung zu einer Kapitaltheorie', *Zeitschrift für Nationalökonomie*, 8 (1937).
- A-36. 'Das Goldproblem', *Österreichische Zeitschrift für Bankwesen*, 2 (1937).
- A-37. 'Investment that Raises the Demand for Capital', *Review of Economic Statistics*, 19 (1937).
- A-38. 'Economic Conditions of Inter-State Federation', *New Commonwealth Quarterly* (London), 5 (1939).
- A-39. 'Pricing versus Rationing', *The Banker* (London), 51 (1939).
- A-40. 'The Economy of Capital', *The Banker* (London), 52 (1939).
- A-41. 'Socialist Calculation: The Competitive "Solution"', *Economica*, N.S. 7 (1940).
- A-42. 'The Counter-Revolution of Science', pts. I–III, *Economica*, N.S. 8 (1941).
- A-43. 'Maintaining Capital Intact: A Reply to Professor Pigou', *Economica*, N.S. 8 (1941).
- A-44. 'Planning, Science and Freedom', *Nature*, 148 (1941).
- A-45. 'The Ricardo Effect', *Economica*, N.S. 9 (1942).
- A-46. 'Scientism and the Study of Society', part I: *Economica*, N.S. 9 (1942), part II: *ibid.* 10 (1943), part III: *ibid.* 11 (1944).
- A-47. 'A Comment on an Article by Mr. Kaldor: "Professor Hayek and the Concertina Effect"', *Economica*, N.S. 9 (1942).
- A-48. 'A Commodity Reserve Currency', *Economic Journal*, 53 (1943).
- A-49. 'The Facts of the Social Sciences', *Ethics*, 54 (1943).
- A-50. 'The Geometrical Representation of Complementarity', *Review of Economic Studies*, 10 (1943).
- A-51. 'Gospodarka planowa a idea planowania prawa', *Economista Polski* (London), (1943).
- A-52. Edited: 'John Rae and John Stuart Mill: A Correspondence', *Economica*, N.S. 10 (1943).
- A-53. 'The Economic Position of South Tyrol' in: *Justice for South Tyrol*, London, 1943.
- A-54. 'Richard von Strigl' (obituary), *Economic Journal*, 54 (1944).
- A-55. 'The Use of Knowledge in Society', *American Economic Review*, 35 (1945).
- A-56. 'Time-Preference and Productivity: A Reconsideration', *Economica*, N.S. 12 (1945).
- A-57. Edited: "'Notes on N.W. Senior's Political Economy" by John Stuart Mill', *Economica*, N.S. 12 (1945).
- A-58. 'Nationalities and States in Central Europe', *Central European Trade Review* (London), 3 (1945).
- A-59. 'Fuld Beskaeftigelse', *Nationalökonomisk Tidskrift*, 84 (1946).
- A-60. 'The London School of Economics 1895–1945', *Economica*, N.S. 13 (1946).
- A-61. 'Probleme und Schwierigkeiten der englischen Wirtschaft', *Schweizer Monatshefte*, 27 (1947).
- A-62. 'Le plein emploi', *Economie Appliquée*, 1 (1948).
- A-63. 'Der Mensch in der Planwirtschaft' in Simon Moser (ed.), *Weltbild und Menschenbild* (Innsbruck and Vienna, 1948).
- A-64. 'Wesley Clair Mitchell 1874–1948' (obituary), *Journal of the Royal Statistical Society*, 111 (1948).
- A-65. 'The Intellectuals and Socialism', *The University of Chicago Law Review*, 16, (1949).
- A-66. 'Economics', *Chambers's Encyclopaedia*, vol. IV, Oxford, 1950.
- A-67. 'David Ricardo', *Chambers's Encyclopaedia*, vol. XI, Oxford, 1950.

- A-68. 'Full Employment, Planning and Inflation', *Institute of Public Affairs Review* (Melbourne, Australia), 4 (1950).
- A-69. 'Capitalism and the Proletariat', *Farmand* (Oslo), Feb. 17, 1951.
- A-70. 'Comte and Hegel', *Measure* (Chicago), 2 (1951).
- A-71. 'Comments on "The Economics and Politics of the Modern Corporation"', *The University of Chicago Law School, Conference Series* no. 8, Dec. 7, 1951.
- A-72. 'Die Überlieferung der Ideale der Wirtschaftsfreiheit', *Schweizer Monatshefte*, 32 (1952).
- A-73. 'Die Ungerechtigkeit der Steuerprogression', *Schweizer Monatshefte*, 32 (1952).
- A-74. 'Entstehung und Verfall des Rechtsstaatsideales' in *Wirtschaft ohne Wunder* (Albert Hunold, ed., Volkswirtschaftliche Studien für das Schweizerische Institut für Auslandforschung), Zürich, 1953.
- A-75. 'Marktwirtschaft und Wirtschaftspolitik', *Ordo*, 6 (1954).
- A-76. 'Degrees of Explanation', *The British Journal for the Philosophy of Science*, 6 (1955).
- A-77. 'Towards a Theory of Economic Growth, Discussion of Simon Kuznets' Paper' in: *National Policy for Economic Welfare at Home and Abroad*. Columbia University Bicentennial Conference, New York, 1955.
- A-78. 'Comments' in: *Congress for Cultural Freedom* (ed.), *Science and Freedom*, London, 1955 (Proceedings of the Hamburg Conference of the Congress for Cultural Freedom. Also in German).
- A-79. 'Reconsideration of Progressive Taxation', in Mary Sennholz (ed.), *On Freedom and Free Enterprise. Essays in Honour of Ludwig von Mises*. Princeton, 1956.
- A-80. 'The Dilemma of Specialization' in Leonard D. White (ed.), *The State of the Social Sciences*, Chicago, 1956.
- A-81. 'Über den "Sinn" sozialer Institutionen', *Schweizer Monatshefte*, 36 (1956).
- A-82. 'Was ist und was heist "sozial"?' in Albert Hunold (ed.), *Masse und Demokratie*, Zürich 1957.
- A-83. 'Grundtatsachen des Fortschritts', *Ordo*, 9 (1957).
- A-84. 'Inflation Resulting from the Downward Inflexibility of Wages' in Committee for Economic Development (ed.), *Problems of United States Economic Development*, vol. I, New York, 1958.
- A-85. 'La Libertad, La Economia Planificada Y El Derecho', *Temas Contemporaneos*, 3 (1958).
- A-86. 'The Creative Powers of a Free Civilization' in F. Morley (ed.), *Essays in Individuality*, Philadelphia, 1958.
- A-87. 'Freedom, Reason, and Tradition', *Ethics*, 68 (1958).
- A-88. 'Gleichheit, Wert und Verdienst', *Ordo*, 10 (1958).
- A-89. 'Liberalismus (1) Politischer Liberalismus', *Handwörterbuch der Sozialwissenschaften*, vol. IV, Stuttgart-Tübingen-Göttingen, 1959.
- A-90. 'Bernard Mandeville', *Handwörterbuch der Sozialwissenschaften*, vol. VII, Stuttgart-Tübingen-Göttingen, 1959.
- A-91. 'Unions, Inflation and Profits' in Philip D. Bradley (ed.), *The Public Stake in Union Power*, Charlottesville, Va., 1959.
- A-92. 'Freiheit und Unabhängigkeit', *Schweizer Monatshefte*, 39 (1959).
- A-93. 'Verantwortlichkeit und Freiheit', in Albert Hunold (ed.), *Erziehung zur Freiheit*, Erlenbach-Zürich, 1959.
- A-94. 'Marktwirtschaft und Strukturpolitik', *Die Aussprache*, 9 (1959).

- A-95. 'An Röpke', in Wilhelm Röpke, *Gegen die Brandung*, Zürich, 1959.
- A-96. 'The Free Market Economy: The Most Efficient Way of Solving Economic Problems', *Human Events*, 16 (1959).
- A-97. 'The Social Environment' in B. H. Bagdikian (ed.), *Man's Contracting World in an Expanding Universe*, Providence, R. I., 1960.
- A-98. 'The Corporation in a Democratic Society: In Whose Interest Ought It and Will It Be Run?' in M. Anshen and G. L. Bach (eds.), *Management and Corporations 1958*, New York, 1960.
- A-99. 'The Non Sequitur of the "Dependence Effect"', *The Southern Economic Journal*, 27 (1961).
- A-100. 'Die Ursachen der ständigen Gefährdung der Freiheit', *Ordo*, 12 (1961).
- A-101. 'The Moral Element in Free Enterprise' in National Association of Manufacturers (ed.), *The Spiritual and Moral Element in Free Enterprise*, New York, 1962.
- A-102. 'Rules, Perception and Intelligibility', *Proceedings of the British Academy*, 48 (1962).
- A-103. 'Wiener Schule', *Handwörterbuch der Sozialwissenschaften*, vol. XII, Stuttgart-Tübingen-Göttingen, 1962.
- A-104. 'Alte Wahrheiten und neue Irrtümer' in *Das Sparwesen der Welt* (Proceedings of the 7th International Conference of Savings Banks), Amsterdam, 1963.
- A-105. 'Arten der Ordnung', *Ordo*, 14 (1963).
- A-106. 'Recht, Gesetz und Wirtschaftsfreiheit' in *Hundert Jahre Industrie und Handelskammer zu Dortmund 1863-1963*, Dortmund, 1963.
- A-107. Introduction to 'The Earlier Letters of John Stuart Mill', *Collected Works of John Stuart Mill*, vol. XII, Toronto and London, 1963.
- A-108. 'The Legal and Political Philosophy of David Hume', *Il Politico*, 28 (1963).
- A-109. 'The Theory of Complex Phenomena' in Mario Bunge (ed.), *The Critical Approach to Science and Philosophy. In Honor of Karl R. Popper*, Glencoe, Ill., 1964.
- A-110. Parts of 'Commerce, History of', *Encyclopaedia Britannica*, vol. VI, Chicago, 1964.
- A-111. 'Die Anschauungen der Mehrheit und die zeitgenössische Demokratie', *Ordo*, 15/16 (1965).
- A-112. 'Kinds of Rationalism', *The Economic Studies Quarterly* (Tokyo), 15 (1965).
- A-113. 'Personal Recollections of Keynes and the "Keynesian Revolution"', *The Oriental Economist*, 34 (1966).
- A-114. 'The Misconception of Human Rights as Positive Claims', *Farmand*, Anniversary Issue, 1966.
- A-115. 'The Principles of a Liberal Social Order', *Il Politico*, 31 (1966). German reprint in *Ordo*, 18 (1967).
- A-116. 'Dr. Bernard Mandeville', *Proceedings of the British Academy*, 52 (1966).
- A-117. 'L'Étalon d'Or — Son Evolution', *Revue d'Économie Politique*, 76 (1966).
- A-118. 'Resultats de l'action des hommes, mais non de leurs desseins', in *Les Fondements Philosophiques des Systemes Economiques. Textes de Jacques Rueff et essais rediges en son honneur*. Paris, 1967.
- A-119. Remarks on 'Ernst Mach und das sozialwissenschaftliche Denken in Wien' in Ernst Mach Institut (ed.), *Symposium aus Anlass des 50. Todestages von Ernst Mach*, Freiburg B., 1967.
- A-120. 'Rechtsordnung und Handlungsordnung' in Erich Streissler (ed.), *Zur Einheit der Rechts- und Staatswissenschaften*, Karlsruhe, 1967.

- A-121. 'The Constitution of a Liberal State', *Il Politico*, 32 (1967). German reprint in *Ordo*, 19 (1968).
- A-122. 'Bruno Leoni, the Scholar', *Il Politico*, 33 (1968).
- A-123. 'A Self-Generating Order for Society' in John Nef (ed.), *Towards World Community*, The Hague, 1968.
- A-124. 'Economic Thought, VI: Austrian School', *International Encyclopaedia of the Social Sciences*, vol. IV, New York, 1968.
- A-125. 'Carl Menger', *International Encyclopaedia of the Social Sciences*, vol. X, New York, 1968.
- A-126. 'Scientismus' in W. Bernsdorf (ed.), *Wörterbuch der Soziologie*, 2nd ed. Stuttgart, 1969.
- A-127. 'Three Elucidations of the "Ricardo-Effect"', *Journal of Political Economy*, 77 (1969).
- A-128. 'The Primacy of the Abstract' in Arthur Koestler and J. R. Smythies, (eds.) *Beyond Reductionism*, London, 1969.
- A-129. *Il sistema concorrenziale come strumento di conoscenza* (The Competitive System as a Tool of Knowledge. With English summary), *L'industria*, Jan--March 1970, 1, pp. 34-50.
- A-130. *A tiger by the tail. A 40-years' running commentary on Keynesianism*. Compiled and introduced by Sudha R. Shenoy. With a new essay by Hayek: "The Outlook for the 1970's: Open or Repressed Inflation?" Hobart Paperback. London: Institute of Economic Affairs, 1972. Pp. xi, 124.
- A-131. 'Die Stellung von Mengers "Grundsätzen" in der Geschichte der Volkswirtschaftslehre', *Zeitschrift für Nationalökonomie*, 32 (1), 1972. English version in J. R. Hicks and W. Weber, *Carl Menger and the Austrian School of Economics*, Oxford, 1973.