A Student's Pilgrimage *

The Editor of this journal long since invited me to give some account of my scholarly experience. At his renewed desire I shall try to trace the evolution of my thoughts over the exact half-century since my first article was published. But this will be the brief story of ideas, not, in the main, of personal events.

We read sometimes of *general ideas*, such as belong to no one compartment of knowledge or culture but underlie them all. In that perspective, I think that all creative endeavours, of the poet, the painter, the symphonist, the mathematician, and even of the far-scanning business man, are informed by a single elusive but powerful urge, which we must call the desire to achieve beauty. All these various types of human individual are *dreamers*. 'Behold, this dreamer cometh.' The man thus spoken of is the hero of the greatest success-story in human annals, the rescued waif in his coat 'of many colours', who became the Prime Minister of his adopted land. History as it condenses from the void of time-to-come is the mutual entangling of individual dreams. Since business life lies near the heart of general history, it too must share this character of a textile fabric of imagined things, changing as they are actualized. This, then, is the phenomenon that economists undertake to study. Is my suggestion here a paradox and a Quixotry? It is the view of things that long thoughts have brought me to.

Elizabeth Bowen in one of her novels has a sentence which can be a wonderful solvent of regret: 'Chance is better than choice, it is more lordly. Chance is God, choice is man.' It was no deliberate choice of mine which led to my becoming a humble clerk (at first, a mere office-boy) in a bank at the age of seventeen. It was then, however, that I started to read economics as a likely path to lead sometime to a university degree; a path suggested by the nature of the bank's business.

As a child I had at first one playmate only, my father, a mathematician. Thus early I breathed a little mathematical ozone. I told the bank manager of my ambitions, and this kindly and enlightened man allowed me an hour in the middle of each day for study. (It would have been otherwise impossible: my work seldom ended before seven in the evening: this was before the days of xerox copiers.)

The next piece of good fortune, somewhat disguised, was a period of ten years when low vitality was improved by a largely outdoor life as a schoolmaster. I took up again my solitary studies. A book by J. A. Hobson had the excitement of a detective story, the tracking down of the cause of unemployment. Then, in 1931, I received the 'sealed orders' for my career, in two momentous books: *A Treatise on Money* by John Maynard Keynes (whom my father had coached in mathematics for the scholarship which took Keynes to Eton) and *Prices and Production* by Friedrich A. von Hayek. In these books I embarked on a thrilling voyage. The genial, brilliant and at times paradoxical *Treatise* gave me the feel and vision of a world of scholar discourse and debate, relaxed, Olympian, intoxicating. *Prices and Production*, which I read next, brought an extra, astonishing excitement. A diagram which I had invented for myself, to illustrate Keynes's rudimentary account of the Austrian theory of capital (in the *Treatise*, volume two) suddenly appeared before my eyes in print, in Hayek's book, the rising columnar representation of the time-structure of production. At this moment there began, in various journals, the debate between the two writers, with Frank Knight as a third contender. The torrent of ideas swirled and swept around me. My voyage had begun.

* * *

If it was Chance, whatever that may be, that steered me to economics. Chance was kind to me. For it is a field of study which gives scope for many kinds of aptitude, and even distinctly favours versatility rather than high exclusive proficiency in one. If mathematical conceptions are exciting and congenial, so will economic theory be. There is nowadays a movement of thought which would like to persuade itself that mathematics, the apotheosis of reason and certainty, can discover a new language or notation for describing the process of original thought, the business of exploiting the unknown by untrammelled invention. I cannot doubt that a peculiarly felicitous notation has sometimes exhibited suggestive powers amounting almost to being able to 'think

for itself'. Who shall say what paradoxical powers mathematics may bring forth? Yet it is difficult to banish the suspicion that system and freedom have an ultimate mutual intolerance. Few creative mathematicians until recently have concerned themselves with economics, though some have given indispensable, if posthumous, help. Where would the 'adding-up problem' of factor-shares be, without Euler? or where, the ingenious beauty of Leontief's *Tableau Economique*, without Arthur Cayley? But economics is about human affairs, about history-in-the-making, and to understand emergent history we turn to history already made. The nature of history is the nature of humanity. And economics, like every other scholarly involvement, is an art-form. 'Polymath' is not always a polite appellation. But the economist needs to be a great enjoyer of ideas and a connoisseur of their means of expression, a daring sculptor of argument, an eclectic and sometimes an heresiarch.

Agatha Christie has told us that she made up her plots while standing at the kitchen sink. I am in good company, for it was amongst the vapours which there envelop one that I came to the decisive conviction that probability cannot serve the ultimate business of choice. Uncertainty, I thought, is surely not a pyramid of clustering hypotheses each 'partly' believed in, but a wide-spreading plain where things widely unlike each other all claim to be *possible*. What gives an hypothesis the entrée to the counsels of the mind is not the being believed in, but the *not being disbelieved in*. A 'mathematical expectation', it seems to me, is an adding together of mutual exclusives. Does that make sense? Only if every one of those mutual exclusives is going to make its appearance, more or less *often*, in a far-stretching series of trials of some system capable of only restricted variation. When such a series of trials is in contemplation, and when an extensive series has already been performed with that same system, the recorded frequencies of that past series may legitimately be looked upon as *knowledge*, in some practical sense, about the outcome of the contemplated series *as a whole*. But where there is knowledge there is not uncertainty. Uncertainty, *unknowledge*, is what confronts the chooser of action when his act of choice is going to be *once-for-all*, when it is going to be crucial, when it is going to be an experiment the making of which will *destroy the possibility* of ever making that experiment again. In such a case we cannot say what *will* happen, even if we only claim to say it half-heartedly, as a 'probability'. We can only attain some notion of the kinds of thing that *can* happen.

It was, I think, Jacobi who pointed out that in mathematics a problem can sometimes be solved by inverting it. In urging that the

meaningful question about rival, mutually exclusive, suggested answers to some enigma is not whether each of these answers is probable, but whether it is possible, I am in some sense proposing to invert the orthodox conception. For we can treat *perfect adjudged possibility* as entire *absence of disbelief*. The zero of our scale of epistemic standing will represent zero disbelief. Increasing distances along this scale from this zero point will stand for higher and higher degrees of disbelief. Disbelief will reach an absolute maximum at a level standing for *non-possibility*.

These ideas are exploited in the notion of focus-points. A sequel imagined for some feasible action must be assessed by the action-chooser in two respects, its *desiredness* (or counter-desiredness) and its *possibleness*. If he confines himself to imagined sequels to whose actualization he can discern no obstacle (that is to say, sequels which seem perfectly, and therefore *equally*, possible) it is only the most and the least desired of these sequels imagined for a particular action, that need concern him. For it is these which, by themselves, constitute the adjudged potential of the action in question. (I draw attention to this last sentence, and to its dependence on the stipulation of equality of possibleness of the rival imagined sequels.) In order to compare two feasible actions and decide upon one of them, the chooser need only ask himself whether the extra desiredness of one of them is or is not sufficient to outweigh the lesser counter-desiredness of the other.

If, rather than confine himself to hypothetical sequels which he judges to be perfectly possible (ones, that is, to which he can discern no obstacle) he looks to sequels whose extra desiredness or counter-desiredness is made accessible by the acceptance of a less-than-perfect adjudged possibility, the effective 'best' and 'worst' results of the action in question will be located where increasing disbelief just cancels increasing desiredness or counter-desiredness. I have been accustomed to speak of the combined moral effect of *desiredness* and *disbelief*, when their respective degrees are functions of each other, as *ascendancy*. Then we can say that the potential of any feasible action will be represented, in the thought of the action-chooser, by the two constrained maxima of ascendancy.

A span of forty years divides a day in 1937 when the notion of *potential surprise* presented itself to me as a means of graduating the epistemic interval between acceptance and rejection of an hypothesis, from a day in April 1977 when I finished writing *Imagination and the Nature of Choice*. In that span my scheme of thought was enriched but not essentially changed.

To invert the graduation of the epistemic interval by conceiving the interval in terms of *disbelief*, and in especial by expressing the highest degree of acceptance of an hypothesis as zero disbelief or perfect adjudged possibility is to attain a vital end: it is to liberate the business of assigning degrees of epistemic standing from being a *distribution* of a fixed quantity. When a list of hypothetical answers to some question is taken to be complete and exhaustive, we are thereby taking it as *certain* that the truth lies with one or other of these answers. To assign numerical probabilities to the answers in the list is to *distribute* amongst them shares of certainty. It is convenient to represent certainty by the numeral *one*, and numerical probabilities are consequently represented by proper fractions. If now some revision of knowledge leads to an augmentation of the list of hypotheses, it will be necessary to transfer some probability away from members of the initial list to the new members. But why should the acceptability of an hypothesis be a function of the number of its rivals?

What, indeed, is a *sharing of certainty*? What does the assigning of a share of certainty tell us? Can it tell us, in reference to some unique, crucial and self-destructive experiment, about to be made at a proper-named point of the calendar, that this experiment *will* have such-and-such a result? No. Can it tell us that the experiment will *not* have such-and-such a result? No. Then what does it tell us? There is a more deadly matter to be confronted. If the list of plural rival hypotheses is admitted to be liable to extension, to augmentation by the formulation of extra hypotheses, probabilities cannot meaningfully be assigned to the extant members of the list. For it will be obligatory to make the list of hypotheses formally comprehensive by including a *residual hypothesis*, a Pandora's box of contents unknown in character and number. Finally we must ask, why should the epistemic standing of any one hypothesis depend upon, and vary with, the number of its discerned rivals?

The need and the nature of a non-distributional uncertainty-variable was proposed in an article called 'Expectations and Employment' in the *Economic Journal* of September 1939. Other articles followed, and in 1949 the construction which emerged from them was presented, with some of its implications and suggestions, in my *Expectation in Economics*, published by the Cambridge University Press. The referee who recommended the publication of my manuscript was Sir Austin Robinson, to whom I am thus eternally indebted.

Amongst the articles referred to above was one called 'A Theory of Investment Decisions'. It appeared in the original series of *Oxford*

Economic Papers (number 6) in April 1942. A few days after its publication I received from Sir Roy Harrod a letter which gave me an immense surge of encouragement and happiness. That article in its opening sentence introduced a word which has become the central term of my conception of the business of choice, a business which, as I have become profoundly convinced, is in the first place a work of *imagination*. The choosables must be imagined, originated, created, by the chooser himself. They are thoughts, figments. Their nature of invented and *endlessly inventable* things profoundly affects the required character of a means of graduating the epistemic interval which we may conceive to distance from each other the acceptance and the rejection of an hypothesis. For their endless potential proliferation implies that a distributional variable must be wholly inappropriate.

For if choosable courses of action are inventable *ad libitum* by every individual possessor of resources, the sequel of any individual's inceptive use of his resources will be affected, in ways that are *logically* unforeknowable, by the choices that others will make in time-to-come. To use, as I have, the word *logically* in this connection is to give to the word *invent* the meaning of autonomous creation. It is to assume that some thoughts can be in some respects exempt from governance by antecedents, that they can in these respects be uncaused. Such an assumption seems to me indispensable, if we are to claim to be, in a fundamental sense, makers of our own history.

Chance (Elisabeth Bowen saves us so much argument) brought me into a live university *milieu* for the first time on the first day of 1935. Economic theory was in those years being swept by a tidal wave of innovation. Seeds sown long since by Cournot and Marshall had suddenly sprung up into the harvest of imperfect, or monopolistic, competition. A glamorous (I use the word responsibly) theory of money had come into view in Keynes's *Treatise*, and the great pit of business depression into which the world had plunged was the occasion for Hayek's seductively enigmatic *Prices and Production*. Gunnar Myrdal by the dramatic use of a legal term had compelled economists to recognize *explicitly* that action is the fruit of expectation. Keynes's 'Fundamental Equations' of the *Treatise on Money* depended, in some sense unwittingly, on just such recognition. In 1935 the economic air was vibrant with these ideas.

Chance brought me to the London School of Economics at the moment when Hayek was reforming and reformulating Böhm-Bawerk's theory of capital; when Hicks was (in that very term) going to propound

the production plan and the role played in it by the rate of interest; when Brinley Thomas (in that very term) was going to tell a minute class how the seeds sown by Wicksell were blossoming in the work of Lindahl and Myrdal; and when rumours about the book that Keynes was writing were drifting up from Cambridge. Thus by a blessing of chance I entered L.S.E. to begin my Ph.D. dissertation at an electric moment of charged and tingling intellectual excitement.

The wheel which began to turn in 1931, when I read *Prices and Production* for the first of many times, seemed to come full circle in 1976, when I had the honour and astonished happiness of accompanying Professor Hayek on a lecture tour in Spain. Did surging inflation at that time vindicate the theme of *Prices and Production*?

The Austrian theory of capital supposes that *lapse of time* is in itself a factor of production which, if its quantity is increased, allows a more far-reaching division of labour and thus secures a greater output from given efforts of nature and men. Thus it earns its reward in the form of an interest-rate. Such a reward, it was thought (mistakenly, in my view, except in regard to the *building-up* of a process of production) was called for because lapse of time in production would engender impatience in those engaged in production, who were waiting to enjoy the fruits of their work. Lapse of time would accordingly be maintained at that extent where a small increase would secure extra output only just sufficient to compensate for the extra delay. (My objection here is that no delay is involved once the process is on stream, for then yesterday's output is ready to be consumed to-day.) In thus accounting for an interest-rate during a process of building-up of production, the Austrian theory appealed to a *balance at the margin* between the cost and reward of a flow of saving and investment. If so, how could there be, as supposed in the *Treatise on Money*, and fleetingly also on page 21, lines 10-18, of the *General Theory*, a divergence between desired saving and desired investment?

The purpose of the Austrian theory of capital is to account for the existence and the level of a rate of interest. It does so by supposing that the desired flow of saving and the desired flow of investment (making of facilities for production) mutually determine each other. If so, how can desired saving and desired investment in productive facilities diverge from each other and account for unemployment? In order to account for the possibility of massive general unemployment, Keynes needed to invent a new theory of the interest rate. The new theory was Keynes's greatest technical innovation.

Liquidity preference is in itself almost an epitome of Keynes's theory of money and employment. Resources are liquid when they do not depend, for the retention of their value, on the presence and persistence of circumstances confined within a narrow range of variation. Resources are liquid when they are uncommitted to a highly specialized venture. But production is the activity of specializing materials and means to particular technical or aesthetic purposes. There is a conflict between the retention of liquidity and the giving of employment. The business man desires liquidity, and refrains from giving employment, when he feels that he cannot exclude the possibility of disastrous losses as the sequel of any available venture. These ideas are the burden of chapter 17 of the *General Theory of Employment, Interest and Money*, a chapter where Keynes seeks the utmost concise simplicity in stating the ultimate foundations of the theory of employment. But this statement is too general and abstract. It becomes dramatic and vivid when expressed in the mundane business vocabulary of money, bonds, interest-rates, equity shares and the tangible productive facilities of an enterprise. Bonds and shares are *durable*. Their market value to-day therefore depends on ideas of what will be their market value next week, next month, next year. They are *speculative* assets. The long-term rate of interest can be roughly expressed as the market price of a bond with a long time to maturity, divided into its fixed annual coupon. But its price is determined, from hour to hour, in a speculative market, by the shifting inter-active views and relative weight of the Bulls and Bears whose role was invoked by Keynes in the *Treatise on Money*.

It was the release of the interest-rate from the servitude of its role in a general equilibrium which had for me the most powerful practical appeal. But this release was an aspect of something more encompassing and momentous, the acknowledgement that, as I would put it, business is the pursuit of possibilities. Possibilities are thoughts, and they are bound up in bundles each containing good and bad together. Such a bundle (I am here still describing my own scheme) has to be bought as a whole, you cannot have the good possibilities without the bad. Keynes explained massive general unemployment as the consequence of a self-reinforcing spasm of uncertainty, a sentiment which the nature of the human predicament renders from time to time inevitable. In thus explaining it, he explicitly and uncompromisingly rejected the expression, let alone the elimination, of uncertainty by means of objective 'probability'. The most striking thing of all about this abnegation is the absence, from Keynes's writing, of anything to fill the gap left by the

rejection of probability. The 'inducement to invest' in chapter 12 of the *General Theory* is not the upshot of research and calculation, it is 'animal spirits'. It is a clear-cut mistake, as Keynes himself explicitly made clear, to identify the Keynes of the *Treatise on Probability* with the Keynes of the *General Theory*.

* * *

1935 for me was a seething cauldron of ideas. Its heady fumes inspired a thrilling plan. Keynes's *General Theory* cried out, it seemed to me, to be interpreted in Myrdal's terms. I still had a year of my Leverhulme scholarship to run. I had a supervisor, Professor Hayek, of extreme enlightened generosity. I embarked on my plan. My dissertation was completed in February 1937 and polished in the early morning hours of each day during that spring and early summer. It was shown to Sir Henry Phelps Brown (for whom I worked during the body of the day as his research assistant) and by him to James Meade, and was published by the Oxford University Press in May 1938 as *Expectations, Investment and Income*. It was published in a second edition, with a long additional prefatory chapter, just thirty years later, in 1968, this time by the Clarendon Press. When an author becomes an Oxford graduate (as I had by acquiring an Oxford D.Phil) the Oxford University Press undergoes in his regard a mysterious transformation, and while the dignified building in Walton Street remains unchanged in outward appearance, it is for him thereafter the Clarendon Press.

In this first book already, *expectation* was the informing notion and basic theme. For already it was overwhelmingly evident to me that if economics is the endeavour to understand one broad source and aspect of human conduct, it is concerned with *thoughts about time to come*.

In that book I was far from any full conception of the depth and reach of ideas, the involvement with the ultimate philosophical enigmas, which inhere in the term *expectation*. Expectation is imagination, the *originative* gift, the gift which burns, if with a more dazzling light, in the thoughts of the poet, the symphonist, the mathematician. Expectation is momentous. It is the source of human history.

Expectation is necessarily, in the first place, imagination. But plainly it is not unconstrained figment. It is *critical* imagination limiting its creation of hypothetical sequels of any specified course of action, rendered feasible by the individual's possessed resources, to what is free from discernible obstruction. It is only sequels *deemed possible* that can

bear upon the business of choice. But though the sequels imagined, originated, for any feasible action must thus lie within bounds of possibility, they are not, in their nature, limited in number. Since such creation of a skein of rival hypotheses takes time, this process will be somewhere arrested by a deadline, and the skein will remain incomplete and uncompleteable. Expectation thus envisaged is inherently, essentially alien to the purpose of providing a single-number valuation of an investment project, a plan for constructing a specialized production facility looking to many years of useful life. Expectation thus envisaged insists on the mutual unlikeness, the width of qualitative difference, of sequels which are, to the best understanding and insight of the investor, equally possible. Such expectation must be quite differently exploited and employed from the mode of use of the 'mathematical expectation' or a single-number forecast. What I conceive to be its proper use has been the theme of many books, from *Expectation in Economics* of 1949 with its references to articles from 1939 onwards, through *Time in Economics* (North Holland) containing my Professor F. de Vries Lectures of 1957, *Expectation, Enterprise and Profit* of 1970 and others, to what I hope is a rounded statement in *Imagination and the Nature of Choice* published by the Edinburgh University Press in 1979.

* * *

I think there are two kinds of economics. One of them aims at precision, rigour, tidiness and the formulation of principles which will be permanently valid: an economic science. The other is, if you like, rhetorical. This word is often used disparagingly, but that is a modern unscholarly abuse. The rhetorician employs reason and appeals to logic, but he is a user of language at its full compass, where words are fingers touching the keyboard of a hearer's mind. I do not believe that human affairs can be exhibited as the infallible and invariable working of a closed and permanent system.

Aldeburgh

G.L.S. SHACKLE