



CHARLES FEINSTEIN

Charles Hilliard Feinstein

1932–2004

CHARLES FEINSTEIN'S ACHIEVEMENT was to work out the structure and size of the British economy from 1965 and back to mid-Victorian times. This makes it possible to evaluate how well the economy has performed at any point in the past 150 years, and to compare it with other periods and other countries. There is a great deal more: a precocious apprenticeship, an extension of knowledge in related fields and, further back in time, inspiring teaching, effective administration, professional leadership. As a scholar, Feinstein was a master of both structure and detail. As a colleague, he combined authority with integrity and generosity. Beyond scholarship, his life also subsumed a longer arc: the quest for an equitable South Africa in his youth, and its resumption in his final years.

I

A life is formed by its times. Charles was born on 18 March 1932. He was the eldest child of Rose and Louis Feinstein, members of the liberal Jewish community of Johannesburg. Louis had immigrated as a child with moneyless parents from Latvia, and rose to become a prosperous stockbroker. In politics he was an 'armchair Marxist' and current issues were discussed critically at home. Charles excelled at Parktown Boys' High School (modelled on English grammar schools) and graduated before he was sixteen. At Witwatersrand University he studied economics, although with some regrets at not having chosen history. His best teachers left their mark: Helen Suzman, later renowned as the only anti-apartheid MP, in economic history and, in economics, Ludwig Lachmann,

a refugee from Austria and, unusually for the time, a disciple of Hayek. After taking his degree in 1950, Charles was keen to train as a professional economist, but his father insisted on a more secure profession. Three more years of study, and he qualified as a chartered accountant in 1954. It was ‘the most boring period of his entire life’.¹ But he was good at accounting, and it left a mark. He also took a further (‘honours’) course in economics, and appreciated the discipline of dissecting difficult texts with the critical Lachmann.

Charles was determined to change the world as well as to understand it. He joined the Communist Party, the most racially inclusive opponent of apartheid. At the age of twenty-one, he chaired the youth wing of the Congress of Democrats, a small group of whites supporting the African National Congress. Selling the party sheet is a rite of radicalism. His friend Bob Hepple remembers how

Charles insisted that we had to ‘connect with the Black masses’, and this led us to the bus queues every Friday night. The queues were notorious for muggings and stabbings, and you can imagine the astonishment of the waiting black passengers to see young whites ducking and weaving among them apparently impervious to these dangers and to the risk of arrest. Charles’ innocent smile would soon melt any hostility.²

The economics that appealed to him were those of Karl Marx, and he submitted an honours dissertation on the labour theory of value. The external examiner W. H. Hutt, an orthodox economic theorist, rejected it outright. Despite achieving a first class in the exams, Charles failed his degree. He had applied for graduate work in Cambridge, and reported this setback anxiously. The left-wing economist Piero Sraffa generously deferred a decision on admissions until Charles could get there in person. When the day to leave arrived, hundreds of black youths came to chant their farewells at the railway station—his period of active struggle was over.

II

Charles was attracted to Cambridge by the presence there of the Marxist economist Maurice Dobb, and the two remained close for years afterwards. He planned to investigate whether rich-country wealth arose from

¹ Transcript of address at the funeral, composed jointly by members of the family, and read by Alan Stein.

² Bob Hepple, ‘South Africa and Clare College’, in All Souls College, ‘Charles Hilliard Feinstein. Memorial Meeting, 4 June 2005’ (unpub. pamphlet, Oxford, 2005), p. 1.

exploiting the colonies. But Joan Robinson (an eminent Cambridge Keynesian) said to him at a party: ‘How can you explain the prosperity of the Scandinavian economies if it is all due to empire?’³ He decided to focus instead on the metropolitan core of the globalising British economy.

Dr Lucy Slater, a pioneer computer scientist at Cambridge, remembers ‘a man on a motor bike, Charlie Feinstein, who went . . . every morning to fetch us our work [from the Department of Applied Economics] and every evening to take back our results. The lady who was my assistant, Ruth Loshak, married him!’⁴ Ruth was a mathematics graduate who helped to program the EDSAC 2, one of the world’s earliest stored-memory computers, at the Mathematical Lab in Cambridge.⁵ Their first encounter was at a communist meeting, and they married in 1958. Charles’s doctoral dissertation was completed the following year.⁶ Ruth assisted in calculation and typing.⁷ The dissertation (supervised by Robin Matthews) contained the kernel of all of his future work and, in two instances, a good deal of its substance as well. Its core was two long quantitative chapters, one of them a detailed estimate of ‘The Net National Income of the United Kingdom, 1855 to 1914’ derived mainly from income tax data (and from Bowley’s and Wood’s wage series). The other core chapter covered capital formation and overseas investment over the same period. Together, these were the essential components for any encompassing estimate of Victorian national income. Other chapters discussed more discursively the identity of shareholders, the determinants of investment, accumulation and income, housebuilding and local authority spending, the productivity slowdown (‘climacteric’) of the late-Victorian period, entrepreneurship, and working conditions.

It was a golden age for the study of trends in the Victorian economy, a good deal of it at Cambridge, with national income estimates by J. F. Prest, and by James Jeffreys and Dorothy Walters, a brilliant study of inverse

³ Mark Thomas, ‘Interview with Charles Feinstein, All Souls College, Oxford, 2 August 2002’. This is a more complete typescript version of Mark Thomas, ‘An Interview with Charles Feinstein’, *The Newsletter of the Cliometric Society*, 18:3 (Spring 2003), 4–15. It also appears as C. H. Feinstein, Mark Thomas, interviewer. ‘Charles H. Feinstein’ In *Reflections on the Cliometrics Revolution: Conversations with Economic Historians*, ed. John S. Lyons, Louis P. Cain and Samuel H. Williamson (Abingdon, 2007), pp. 286–300.

⁴ Charles G. Renfro, ‘Econometric software: the first fifty years in perspective’, *Journal of Economic & Social Measurement*, 29:1–3 (2004), 17, n. 9.

⁵ University of Cambridge Computer Laboratory, ‘EDSAC1 and after, a Compilation of Personal Reminiscences’ (1999), <<http://www.cl.cam.ac.uk/conference/EDSAC99/reminiscences/#EDSAC%201%20people>>.

⁶ Charles H. Feinstein, ‘Home and Foreign Investment: Some Aspects of Capital Formation, Finance and Income in the United Kingdom, 1870–1913’ (Cambridge University D.Phil. thesis, submitted March 1959).

⁷ Conversation with Ruth Loshak.

cycles of migration and economic activity by Brinley Thomas, long-run UK national income estimates from Phyllis Deane and W. A. Cole, the abstract of British historical statistics by Brian Mitchell and Phyllis Deane, building cycle and capital formation estimates by Karl Maywald and Bernard Weber, and estimates of foreign investment by Albert Imlah and A. G. Ford. Alec Cairncross's remarkable book *Home and Foreign Investment* (1953; itself a revision of a pre-war Cambridge thesis), provided Charles with a title, and a model whose findings he was able to complement and extend. The dissertation is breathtaking in its scope, ambition and rigour of execution. It conveys Charles's particular talent for overarching design and painstaking detail, and also how attractive and promising a field it was at the time.⁸

Cambridge in the 1950s still basked in the afterglow of Keynes. To place Charles in this setting we need to sketch in some history of national income accounting. Estimates of the aggregate income, output and wealth of nations go back to William Petty and Gregory King in the seventeenth century, and continued periodically with growing sophistication in many countries.⁹ In 1933, Simon Kuznets used national accounting estimates from fifteen countries to compare their aggregate incomes before and after the First World War, and estimated USA national income back to 1850.¹⁰ For our purpose, however, the starting point is interwar Britain. The Great Depression of the 1930s had dented the belief in *laissez-faire*. In his *General Theory* of 1936, John Maynard Keynes questioned the doctrine that labour and capital would always be fully employed. His concept of aggregate demand called out for empirical estimation.

Sophisticated national income estimates had already been published for the 1930s by Colin Clark, then a lecturer at Cambridge, who drew on previous work by Bowley and Stamp. The United States was further ahead, with a set of estimates prepared initially by Simon Kuznets and published annually by the federal government from the mid-1930s onwards. The outbreak of war made the issue more urgent and turned the problem upside down: no longer a shortfall of demand but rather an excess of it, that Keynes anticipated when fully employed workers would be chasing fewer goods.

⁸ References may be found in the bibliographies of Charles's dissertation and of his first two books, cited here in nn. 6, 12 and 14.

⁹ Paul Studenski, *The Income of Nations: With Corrections* (New York, 1967); John Kendrick, 'The historical development of National-Income Accounts', *History of Political Economy*, 2 (Fall 1970), 284–315; Carol S. Carson, 'The history of the United States National Income and Product Accounts: the development of an analytical tool', *Review of Income and Wealth*, 21:2 (1975), 153–181; A. Vanoli, *A History of National Accounting* (Amsterdam, 2005).

¹⁰ Simon Kuznets, 'National income', in Edwin Seligman and Alvin Johnson, *Encyclopaedia of the Social Sciences*, vol. 11 (New York, 1933), table 1, p. 206, table 2, p. 216.

In February 1940, Keynes published a small book on *How to Pay for the War*.¹¹ He argued that excess demand could be absorbed by a system of forced saving, or deferred pay, and inflation could thus be averted. He included an estimate of national income, derived from the work of Colin Clark. From his wartime position in the Treasury, Keynes welcomed a more sophisticated set of national accounts prepared in the same year by two temporary civil servants, the economists James Meade and Richard Stone. These accounts were published with the 1941 budget as a White Paper, and every year thereafter. There are several different ways to compile national accounts. The Meade–Stone approach, which was informed by Keynesian macroeconomic concerns, prevailed in Britain, and has also provided the template for successive United Nations models which have diffused across the world.

‘National accounts’ provide a comprehensive quantitative double bookkeeping model of the economy as a whole, with total income on one side, expenditure on the other, and output as a check on both. The income on one side appears as expenditure on the other. Each aggregate table is constructed bottom-up from many statistical series covering particular segments and sectors of the economy. The ability to monitor the movement of the economy on an annual, quarterly or even monthly basis is immensely useful to government, business, commentators, academics, and voters. It did not take long for the numbers to enter into everyday use.

To place the series in longer comparative perspective, it was necessary to extend them back into the past. In the United States, Kuznets published retrospective accounts for the interwar years in 1941, and a similar effort was started by Richard Stone in Whitehall in the same year. After the war, Stone went to Cambridge to head the new Department of Applied Economics, and he took the project with him. It required more than thirty years to finish, and it was Charles who would bring it to completion. Wages and salaries were estimated first by Agatha Chapman, using readily available statistics. Expenditure was more difficult. It consisted of three parts: consumer expenditure, government expenditure, and savings/investment. In 1954 Stone finally published a large volume on consumer expenditure; two additional volumes took ten more years. The complementary volume on capital formation, started by Karl Maywald in 1950, also progressed slowly.

In 1958 Charles took a research position in the department, where he adapted national income series for immediate use, in his role as the ‘statistician’ for its ‘Cambridge and London Economic Service’. Maywald submitted his completed study on capital formation in 1959, but Brian

¹¹ Anticipated in Nov. 1939 by two articles in *The Times*.

Reddaway (who had followed Stone as director) refused to publish it without further revision. They failed to agree, Maywald departed, and the task was handed over to Charles. He found much to revise and to add, and the book was finally published in 1965 as the fourth in the series.¹² Like the dissertation, it conveyed a mastery of design, exposition, and detail. The inter-war national accounts project had now been twenty-five years in the making. Stone's interest had waned, and the ship, so near to completion, seemed destined to remain on the stocks. At that point, in 1965, Charles stepped forward: 'It seemed to me extremely unfortunate that all this work had been done on the components . . . but nobody was going to pull it all together and provide the key series for GDP. So I went to Stone and Reddaway and said I would like to do this.'¹³

He proposed to create a seamless series from 1855 and up to the present. For the post-war period, he would use the existing official statistics. For the Edwardian and inter-war years he relied on the Cambridge project, to which he had made a large contribution. For 1855–1914, he would further develop the series available in his own dissertation. His classic volume was published in 1972.¹⁴ It drew on prior efforts over decades, but was still an extraordinary achievement for a single scholar. With little research assistance, without using computers, it was completed in a remarkably short period of time. In the words of Paul David, 'Charles brought to these undertakings a capacity for the sustained, painstaking "unglamorous" work of mobilising the available statistical sources, sifting and synthesising the contributions of others, removing the conceptual inconsistencies and improving upon the quality of the data wherever possible, presenting the results transparently and evaluating with utter candour the strengths and limitations of the results.'¹⁵ The volume had a set of tables with estimates of the standard national accounts series, and an explanatory section, which described the origins and manipulation of every series, with their approximate margins of error. It was not intended as light reading, but provides transparent descriptions of complicated procedures, with occasional flashes of wit in the footnotes.

During the 1950s and the 1960s, a new wave of historical national accounts appeared in several countries, framed to conform with the templates set out by the United Nations, or some variant thereof. In this wave

¹² C. H. Feinstein, *Domestic Capital Formation in the United Kingdom, 1920–1938* (Cambridge, 1965).

¹³ Thomas, 'Interview'.

¹⁴ C. H. Feinstein, *National Income, Expenditure and Output of the United Kingdom, 1855–1965* (Cambridge, 1972).

¹⁵ Paul David, 'Intellectual Achievement' in 'Memorial Meeting'.

Charles's volume stands out for its integration of form with content. The physical shape was inherited from the series: a distinctive oversized red volume, laid out attractively on thick cream paper by Cambridge University Press. It was a sourcebook, with no explanatory aspirations. But for British economic history it was an act of closure as definitive as Liddell and Scott's *Greek Lexicon* in another discipline and age. It strikes me as the most elegantly reasoned, organised and presented of its wave.¹⁶ Like Liddell and Scott, national accounts are never truly finished: they need to strike a balance between availability and perfection. Charles knew when to stop. The tables provided a foundation for others to build upon. In this role the book has endured well. Despite some minor subsequent revisions (by Charles and by others), it remains the first port of call even in its original form.

In 1963 Charles became an assistant university lecturer in economic history, and fellow and director of studies in economics at Clare College. The man he replaced in the economics faculty had lectured on the United States, but Charles decided to teach Russia instead. He went to Moscow for a few weeks to study economic history and Russian. In the absence of a market system, the Soviet Union had a completely different system of national accounts (the Material Product System). Soviet economic performance was impressive at the time, and interest in it was high. It has since emerged that Charles's lectures had introduced Russian economic history to most of the current British academic specialists in the field. Charles began to move away from communism in 1956, after Khrushchev's 'secret speech' denunciation of Stalin and the invasion of Hungary, and he left the party in 1960. The time in Moscow intensified his disillusion. But he remained on the left, edited a Festschrift for Maurice Dobb in 1967, and in the same year gave evidence in court in support of the Oilfields Workers Union of Trinidad. Ruth turned towards Russia as well. Caring for the family made computer work difficult, so she learned the language and became a freelance translator of Russian scientific texts. The Russian interest also attracted a Fulbright Fellowship, which took the family to Harvard in 1967–8. Charles studied Russian microfilms there, but did not publish the papers he wrote. He never lost interest in Russia, continued to teach the subject, and facilitated two conferences on communist economics in 1980 and 1995. In 1981, after his appointment to a chair at York, he gave a set of three inaugural lectures on the 'Soviet Economy and Society since Stalin'. I found, as a co-examiner in the 1980s, that he still considered the benefits of Soviet

¹⁶ This is not a judgement on the accuracy, completeness and methodology of any of the other projects.

industrialisation to outweigh its human cost. But he only wrote two brief studies of the USSR, both of them critical and both after its demise.¹⁷

At Clare his commitment and ability were soon manifest. A few fellows regarded him as a dangerous Marxist (he was active in the peace movement and Chairman of Cambridge CND), but the college elected him Senior Tutor in 1969. He had earlier helped (at university level) to negotiate co-education in the first three colleges, and Clare had just admitted women students. Student unrest had spread to Cambridge. Charles handled these issues with ‘flexibility, humanity and complete integrity . . . The students found in him someone willing, in a way many other senior members would not have been, to engage with them in patient and good-humoured discussion about student grievances.’ He was firm, but knew when to be lenient.¹⁸ Colleagues knew that he would not ask them for more than he asked of himself. Bob Hepple remembers Charles sitting up late at night to sign and post acceptance letters so that candidates would receive them before Christmas. By 1978, when I first met him, Charles had become the image of the superior type of Cambridge don—upright, courteous, well-spoken, well-dressed, and a little aloof. But then he would flash that smile, reassuring in its warmth and generosity. Robin Matthews (Master of Clare from 1975) regarded Charles as already fit to be the head of a college, or the vice-chancellor of a university.

III

Charles was modest about his achievement. He liked to quote a line from Lionel Trilling’s novel, *The Middle of the Journey* (1947): ‘He knew that he would never be great, he was reconciled to being useful.’¹⁹ Disclaiming originality for his dissertation, he stated his credo there in lines from a Victorian poet:

That is, act
On a dispassionate judgment of the fact;
Look at the data fairly in the face,
And rule your judgment simply by the case.²⁰

¹⁷ ‘Why Socialism fails’ (unpub., 1992—available from the author); ‘Technical progress and technology transfer in a centrally-planned economy: the experience of the USSR, 1917–1987’ in C. H. Feinstein and C. Howe (eds.), *Chinese Technology Transfer in the 1990s: Current Experience, Historical Problems and International Perspectives* (Cheltenham, 1997).

¹⁸ Hepple, ‘Memorial Meeting’.

¹⁹ Anne Digby, ‘South Africa Again and the Retirement Years’, All Souls College, ‘Memorial Meeting’ (2005).

²⁰ Arthur Hugh Clough, ‘Dypsychus’, cited Feinstein, ‘Home and Foreign Investment’, Preface, n.p.

His contribution, he said later, was to provide the data, not to test hypotheses.²¹ This was not only a matter of taste or temperament. It was a coherent methodological position that was shared, and argued for, by his mentors and models among the fathers of national accounting, particularly in Cambridge, and which reflected the primacy they gave to observation over theory.

They did not reject mathematical logic or statistical rigour. What they doubted were the deductive models of partial and general equilibrium originating with Walras, Samuelson, and Arrow–Debreu, which implied that markets necessarily allocated resources efficiently, that market outcomes were always for the best, and that they rewarded everyone justly. Simon Kuznets, their doyen, thought that the task of theory was to specify the variables to be measured. It was not immutable, but merely identified a set of empirical regularities, which needed to be revised in the light of new knowledge, and was sensitive to changing social values. It was risky to accept data without understanding how they came into being. More than one model could be fitted to any set of data, and a good statistical fit could not by itself guarantee correctness. Charles met Kuznets several times at Harvard. Kuznets's method, like that followed by Charles, was essentially inductive: 'from measurement to estimation to classification to explanation to speculation', though Charles might hesitate before that final step.²²

A similar scepticism was expressed by two other leaders of national accounting. Richard Stone chose a dialogue from *Crochet Castle* (1831) by Thomas Love Peacock for his epigraph in the second volume of the Cambridge interwar national income series. Mr Mac Quedy praises the modern political economy, 'the science of sciences'. He is mocked by

THE REV. DR FOLLIOTT. 'A hyperbarbarous technology, that no Athenian ear could have borne. Premises assumed without evidence, or in spite of it; and conclusions drawn from them so logically, that they must necessarily be erroneous'.²³

To drive the point home, a second text, from Alfred Marshall, was added:

the work of the economist is 'to disentangle the interwoven effects of complex causes'; and that for this, general reasoning is essential, but a wide and thorough study of facts is equally essential, and that a combination of the two sides of the work is alone economics proper.

²¹ Thomas, 'Interview'.

²² Erik Lundgren, 'Simon Kuznets' contribution to Economics', *Swedish Journal of Economics*, 73 (1971), 460; also Robert W. Fogel, 'Simon S. Kuznets: April 30, 1901–July 9, 1985' (Cambridge, MA, 2000), NBER Working Paper 7787.

²³ Richard Stone and Deryck A. Rowe, *The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom 1920–1938* (Cambridge, 1954), p. xxiv.

Wassily Leontief, the interwar inventor of input–output analysis (a technique that partly overlaps with national accounting and is now integral to it) made similar points in two iconoclastic articles.²⁴ In an interview towards the end of his life he said, ‘Essentially, theory organizes facts . . . Practical advice could and should be more based on understanding how the system works.’²⁵

Kuznets, Stone, and Leontief were not mindless empiricists. All three of them eventually won the Nobel Memorial Prize in Economic Science.²⁶ Kuznets originated seminal cyclical theories of economic activity and inequality. Leontief described himself as a mathematician and theorist. He later wrote, ‘When I developed input–output analysis it was as a response to the weaknesses of classical–neoclassical supply-and-demand analysis . . . I felt that general equilibrium theory does not see how to integrate the facts . . . My feeling is that the fundamental theoretical understanding of economic fluctuations is as a dynamic process’ [i.e., not an equilibrium one].²⁷ Richard Stone’s consumer expenditure research stimulated the development of standard econometric methods for dealing with serial correlation (Cochrane–Orcutt and Durbin–Watson), and also applied a simple pioneering neoclassical model of the individual consumer. Brian Reddaway, the sharp, charismatic and mathematically trained successor to Stone, and the greatest Cambridge influence on Charles, was openly sceptical about mathematical modelling, even of the econometric methods developed by Stone. Following on his teacher Keynes, he rejected such models as not being demonstrably unique interpretations of the evidence, that is, as failing to rule out alternatives.²⁸

Governments had taken up national accounting in the 1930s because of the market failures of depression and war: it provided the means to design interventions and to monitor them in pursuit of prosperity and full employment; the data were published and available to all. Observation and deduction both have a role in science and are needed to discipline each other. The sceptical position was scientifically sound: a preference for observation over speculation as a way to the truth, and a reality check on theoretical constructs. Experience has borne it out: like

²⁴ Wassily Leontief, ‘Implicit theorizing: a methodological criticism of the neo-Cambridge School’, *Quarterly Journal of Economics*, 51:2 (Feb. 1937), 337–51; ‘Theoretical assumptions and nonobserved facts’, *American Economic Review*, 61:1 (Mar. 1971), 1–7. (Presidential address to the American Economics Association, 1970).

²⁵ Duncan K. Foley, ‘An interview with Leontief’, *Macroeconomic Dynamics*, 2 (1998), 121, 126.

²⁶ This does not confer infallibility, but indicates standing in the discipline.

²⁷ Foley, ‘Interview with Leontief’, 117–19.

²⁸ Ajit Singh, ‘William Brian Reddaway, 1913–2002’, *Proceedings of the British Academy*, 138: *Biographical Memoirs of Fellows*, 5 (2006), 287, 295–6, 301. These criticisms go back to J. M. Keynes, ‘Professor Tinbergen’s method’, *Economic Journal*, 49:195 (Sept. 1939), 558–77.

other ventures of the thirties (radar, electronic computation, nuclear physics) what began as an academic problem ended up as an elaborate state technology within less than a decade. Like those other technologies, it is enduring and pervasive. It works unobtrusively in the service of government, business and scholarship. Its deductive rivals (especially computable general equilibrium) are less modest in their ambitions, but (with their assumption of rational behaviour) resemble belief systems as much as failsafe techniques (which is not to underestimate the power of belief, and indeed its necessity). National accounting made it easier, and therefore necessary, for governments to provide those services that only governments can provide, or those they provide more efficiently (education, health, social insurance, central banking, infrastructure), and thus to satisfy the aspirations of voters. Indeed, national accounts may have gone beyond measuring the preferences of voters and into shaping them, by setting up a target for affluence and helping to monitor it. This success in devising a working model of the economy is one reason why governments have become so large and indispensable, why even conservatives have to be social-democrats now.

Charles published his *National Income* towards the end of the heroic phase of historical national accounting. What next? Simon Kuznets was coordinating a project to compare and explain economic performance in seven different countries. Robin Matthews had signed up Charles to join him in the British volume in the late 1960s (together with John Odling-Smee). Imminent publication was announced in 1972, but it required ten more years.²⁹ The study moved beyond national accounting, to examine the determinants and scale of growth rates in different sub-periods. It drew on 'growth accounting', developed by Edward Denison and John Kendrick in the 1950s. This was based on the Solow neoclassical model of the same decade, in which economic growth was seen to arise out of increments of labour, capital, and knowledge. The flow of output in growing economies rose faster than the flow of economic inputs (labour, capital, natural resources). This large unexplained positive bonus was referred to as the 'residual', or more technically as 'total factor productivity' (TFP), i.e. that part of growth not accounted for by growth in the inputs of capital and labour. TFP represented 'any contribution that may arise from increasing returns to scale and from the effects of technical progress and advances in knowledge, of shifts in resources between sectors, and of changes in the extent of obstacles to more efficient use of resources (e.g. restrictive practices on the part of

²⁹ R. C. O. Matthews, C. H. Feinstein and J. C. Odling-Smee, *British Economic Growth, 1856-1973* (Oxford, 1982).

management or trade unions). It will also reflect any errors in the measurement of inputs and output, and in the specification of the relationship between them.³⁰ The study was a painstaking and immensely detailed breakdown of growth and TFP by sector and sub-period. It had a bearing on the perennial issue of performance and putative decline, both in international comparison, and in different periods of time. But it had taken too long, and its Keynesian assumptions were out of tune with the times. Although it stimulated a great deal of further research, of the seven projected country volumes only two others were ever published (France and Japan).³¹

The mood had already shifted in economics, from the empirically minded, social-democratic, Keynesian consensus of the 1950s and 1960s, towards the efficient market and rational expectations models of the 1970s, which were associated with Chicago economics and its market-liberal rejection of the state. A similar movement also arose within the discipline of economic history. In the United States and Britain, it was previously concerned with the development of industries, technologies, firms, and social institutions such as labour unions and government regulation. In the 1960s, a new approach to the past emerged in the USA which came to be known as the ‘new economic history’, or ‘cliometrics’. It premised that individual rationality and market equilibrium provided a good explanatory framework for the economic past. It typically postulated a causal mechanism suggested by deductive economic theory, and sought to measure it by means of a statistical test of the explanatory power of each of a cluster of quantitative variables on the ‘dependent variable’ to be explained. Identifying the relative importance of labour and capital as independent sources of economic growth also followed this procedure, but did not really count, since for Charles and his colleagues it was primarily an empirical investigation with no particular theoretical agenda.

By the mid-1970s cliometrics had achieved some dazzling counter-intuitive findings, most famously Robert Fogel’s study which scaled down the contribution of railways to economic growth, and his joint study of slavery with Engerman (*Time on the Cross*), which showed that slavery was profitable. More relevant to Charles were Donald McCloskey and Lars Sandberg on the rationality of entrepreneurs, and McCloskey’s landmark macroeconomic article, ‘Did Victorian Britain fail?’ (*Economic History Review*, 1970). Previous writers on British economic stagnation suggested that it had. McCloskey’s approach implied that the notion of

³⁰ Matthews, Feinstein and Odling-Smee, *British Economic Growth*, p. 15.

³¹ A tinge of regret by Matthews, in Nick von Tunzelman and Mark Thomas, interview ‘R. C. O. Matthews’, in *Reflections on the Cliometrics Revolution: Conversations with Economic Historians*, ed. John S. Lyons, Louis P. Cain and Samuel H. Williamson (Abingdon, 2007), p. 162.

failure was meaningless in neoclassical terms. From that angle, no slack was possible—capital and labour were assumed to pursue economic advantage to the hilt, and underperformance could only arise from resource deficiencies, not human failings. But however original, acute, and stimulating, these studies had none of the finality of national accounting: they depended on speculative theory, and their findings have remained a matter of controversy.

Charles was almost present at the founding. At the weekly seminar at Harvard (in 1967–8) he met many of the pioneers, and came to count some of them as lifelong friends. In 1968 he flew out to attend the annual cliometric conference at Purdue University, and was impressed. In coming decades, this movement profoundly altered the style of economic history. In North America, after a short period of strife, the study and teaching of economic history moved out of history departments and into economics. In UK universities the effect was different, but no less profound. The quantitative work of the 1940s and 1950s in Britain anticipated the approach, but without its marketising agenda. Many independent small departments of economic history had sprung up in the 1960s and the 1970s. Cliometrics left their staff becalmed: mere depictions of economic life now seemed superficial, and yet, being trained as historians more than economists, most of them had neither skills nor the convictions to practise cliometrics. For its part, cliometrics, with its avowal of efficient markets, did not speak to the concerns of British undergraduates (as it may have done for American academics). Economic history in British universities gradually dwindled as historical research withdrew from economic life and turned towards discourse, culture and subjective experience.

Charles hosted the first British cliometric conference at Clare College, and was a natural candidate for the cliometric movement, perhaps even to lead it in the UK. His jointly authored *British Economic Growth* of 1982 incorporates the Solow neoclassical production-function growth model as the base of its total factor productivity calculation. But the volume (like Kuznets, its general editor) explicitly eschewed ‘sophisticated statistical or econometric methods’, on the grounds that ‘A less formal approach to the data reduces the risk that all the emphasis is placed on a single explanation, which may in reality be false.’³² Although Charles knew, admired and befriended the main protagonists, he remained outside the ‘new economic history’. In some respects this was prescient. In the late 1970s time-series analysis, which was a key cliometric tool, turned out to depend for its validity on an implicit assumption (quite often

³² Matthews, Feinstein and Odling-Smee, *British Economic Growth*, p. 10.

inappropriate) of a stationary (i.e. stable) relation among its independent and dependent variables. In the next decade, new tools (testing for stationarity) emerged to deal with this problem. In the meantime, however, this issue had silently invalidated a good deal of prior cliometric work. The methods of national income analysis were not seriously affected.

An obvious progression from national accounting was to model the economy as a market equilibrium ('computable general equilibrium'). This was the economist's equivalent to the historian's 'seamless web', the assumption that everything affected everything else. Unlike the scepticism of conventional history, it also embodied the neoclassical assumptions that markets were for the best. The procedure was to take some subset of variables from the economic universe, to specify their interrelation by means of simultaneous equations, to insert empirical parameters from the historical evidence, and to solve for a market equilibrium. It required strong assumptions, namely the standard economic ones that outcomes represented the equilibrium of market transactions, and that the relevant market relations were adequately captured. If these premises were accepted, and if the model was unique, then computable general equilibrium made it possible to estimate the respective impacts of changes in prices, technology, or economic policies, and to simulate the effect of alternative, counterfactual scenarios, while taking feedback effects into account. In its top-down encompassing explanatory ambitions, this approach was the most far-reaching application of the 'new economic history'. It was a theory-intensive high-tech alternative to the data-centred, bottom-up and largely descriptive approach of the national income accountants.

An early exponent of computable general equilibrium in economic history was Jeffrey G. Williamson, at Wisconsin and later at Harvard. His first study appeared in 1974, and in 1986 he published *Did British Capitalism Breed Inequality?* This tested a famous Kuznets hypothesis, namely that in the long-run course of economic growth inequality would first increase, before it began to decline once again. Crucial industrial skills would grow scarce in the early stages of industrialisation, increasing earning differentials. Economic growth would stimulate investment in these skills, and their abundance in later stages would reduce the skill premium and hence inequality overall.

Charles accepted the book for review with few prior expectations, and his article eventually occupied thirty pages in the *Journal of Economic History*.³³ He was not familiar with computable general

³³ Charles Feinstein, 'The rise and fall of the Williamson Curve', *Journal of Economic History*, 48:3 (1988), 699–729.

equilibrium, but no one had a more intimate knowledge of British historical statistics. He criticised both the data and the model. An inverse U-shaped time-series ‘Kuznets curve’ of inequality required analogous inverse U-shaped earnings curves for skilled and professional workers. This was at odds with previous findings, and was inherently implausible. A measurement of inequality by means of Inhabited House duty was undermined by misreading of sources. Estimates of middle-class earnings likewise rested on incorrect readings of tax statistics. Previous investigators were misinterpreted. Why was there no analysis of sensitivity to alternative premises, and could prices really be taken as given by world markets (the ‘small country’ assumption)? Productivity measures, skill trends, and price estimates contained inconsistencies. It was not that the model was inappropriate (though the reviewer’s tone might sometimes suggest it), but that models could not deliver with poor data. Implicitly this was Leontief’s view again, that description came before theory, and was not inferior to it. Partly it arose from a difference of analytical temperament, a preference for measurable reality over abstract modelling. But it also arose (I think) from another tension which the protagonists were loath to probe or even to admit—namely, between those who regarded numbers as the servants of history, and those for whom history would vindicate economic theory and the primacy of markets. It would not be far-fetched (though not entirely true either) to associate cliometrics with the market-liberal doctrines with which it coincided.

The turmoil of the cliometric revolution has abated somewhat, as market liberalism encountered some reality checks, and economics itself has become more empirical, more accommodating of disequilibrium, as it encompassed large datasets and observations on actual human choice and behaviour, and as deductive high theory is no longer so hegemonic. It might even be argued that current cliometrics has not kept up with the times, and remains too focused on the concerns of its pioneers. Charles’s position (and that of the post-war national accountants) appears to be vindicated—his research, which is primarily descriptive, does not depend for its validity on the counter-intuitive simplifications of rational choice, and can be made to work with different theories of motivation and social interaction. Charles hoped that the dust-up with Williamson left few lingering resentments, and that it encouraged respect for data integrity. It is still a focal point for a methodological divide that remains charged. It confirmed Charles in his convictions. Theories came and went, good data endured: ‘I think that the assets I construct are more likely to prove durable if I do one type of work rather than another. It might be more exciting and more intellectually demanding to try and do more

speculative and theoretical research, but I doubt that it would make a lasting or worthwhile contribution.³⁴

Introducing his two-volume estimates of American national income in the interwar years, Simon Kuznets wrote, 'For those not intimately acquainted with this type of work it is difficult to realise the degree to which estimates of national income have been and must be affected by implicit or explicit value judgments.'³⁵ The ultimate purpose of the economy was to promote human well-being, but (for technical reasons) that was not something that national accounts could measure. Already in 1933 he stressed that accounts based entirely on market and government activity left out much welfare created outside the market, such as housework, leisure, and life expectation, and measured some market payoffs incorrectly, by, for example, neglecting the effect of income distribution, and of the atrophy of individual human physical and intellectual capital. They counted as output many flows which might be regarded as bad rather than good.³⁶ Even at that early stage it was tempting to take income or product per head as the main measure of social success, which Kuznets warned against. The mismatch of Gross National Product with human well-being was taken up again by eminent national accountants, including John Kendrick in 1967, and Nordhaus and Tobin in 1972. Ever since there has been a steady effort to 'extend' the national accounts to encompass these and other unmeasured goods and bads.³⁷ Charles, working within the Stone template, did not participate in these developments.

Another opportunity to extend the paradigm arose in the 1980s. One feature of the national accounts was a large gap between the estimates based on income, and the higher ones based on expenditure.³⁸ Charles had provided a 'compromise estimate' derived from the arithmetical mean. Statistical and computational advances made a more accurate balancing procedure possible. Despite long-standing concerns about measurement error, and some initial interest on his part, this project was eventually

³⁴ Thomas, 'Interview'.

³⁵ Simon Smith Kuznets, Lillian Epstein and Elizabeth Jenks, *National Income and Its Composition, 1919–1938* (New York, 1941), p. 5.

³⁶ Kuznets, 'National income', pp. 207–11; Simon Kuznets, *National Income: A Summary* (New York, 1946), pp. 121–8.

³⁷ Avner Offer, *The Challenge of Affluence: Self-Control and Well-Being in the USA and Britain since 1950* (Oxford, 2006), pp. 16–21.

³⁸ Feinstein, *National Income*, fig. 1.1, p. 12. Charles was probably unaware that the tax assessments which form the basis of the income series were estimated for a small fee by lay assessors, who were typically local businessmen. This procedure was likely to bias the assessments downwards and may have accounted for much of the gap. It is described by Martin Daunton, *Trusting Leviathan: The Politics of Taxation in Britain, 1799–1914* (London, 2001), pp. 184–93.

completed by others.³⁹ In both cases he may have judged that the results would not repay the effort.

Charles chose instead to estimate capital formation backwards to the eighteenth century. This was an essential preliminary for complete national accounts, and also impinged on the core preoccupation of economic history: fixed capital formation (machinery, buildings, infrastructure), or aggregate saving, its close analogue, had long been seen as the main driver of economic growth, in theories of growth from Adam Smith to Karl Marx, and on to W. W. Rostow. Kuznets had always suspected otherwise, and a key volume by Kendrick in 1961 established that it was not so crucial, and that human creativity (captured statistically as the 'total factor productivity') was the decisive factor.⁴⁰ Instalments of the capital formation series came out during the 1970s and 1980s, and in their final form as the second half of *Studies in Capital Formation in the United Kingdom, 1750–1920*, which Charles edited with Sidney Pollard in 1988. Despite his expertise, Charles took no part in the theoretical debates convulsing Cambridge, on whether capital was a coherent and tractable category. His job, he said, was merely to measure its historical cost. But the acrimony of the debate unsettled him.

IV

Charles and Ruth had four children, Jessica, Naomi, Leon and Judy, and they treasure memories of a happy upbringing and a loving family. But by the mid-1970s the marriage was under strain, leading to separation in 1977. For Charles, a release from domestic and academic pressures came with his acceptance of the Chair of Economic History at the University of York. He arrived there in the autumn of 1978. The Department of Economics and Related Studies was large, with a good reputation. The move up north was a turn away from an economics discipline that felt increasingly alien, and back towards economic history. It was also a renewal of personal happiness. He married Anne Digby in 1980. She was an accomplished social historian, and provided a more intimate link with the discipline of history. They settled in a large old house in Marygate, just outside the Museum Gardens, and relished living a short walk from

³⁹ James Sefton and Martin Weale, *Reconciliation of National Income and Expenditure: Balanced Estimates of National Income for the United Kingdom, 1920–1990* (Cambridge, 1995). Published as the final successor volume to Feinstein, *National Income*, in the Cambridge historical accounts series.

⁴⁰ John W. Kendrick and Maude R. Pech, *Productivity Trends in the United States* (Princeton, 1961).

the heart of that beautiful and civilised city. When the British Association came to visit York, Charles edited a book on the history of the city, and wrote one chapter himself on the town's 'population, occupations and economic development, 1831–1981'.⁴¹ Together they edited *ReFRESH*, a periodical in economic and social history for secondary schools. More professional recognition also followed. In 1980 he began to edit (with John Hutton) the *Economic Journal*, the top UK academic journal in the field. In 1981 he became head of department, and in 1983 a Fellow of the British Academy.

For academics, administration is almost their only taste of the business of 'real life', where they have visions and carry them out, where they bargain and persuade, form alliances and fall out, achieve or fail. In my own experience, Charles had two exceptional qualities as an academic leader. He had a gift for order, an uncanny intuition that penetrated the veils of convention and emotion, to get to the essence of a problem. And he was able to communicate this understanding in lucid, well-paced language, and to make other people feel as if they possessed a similar clarity. His innate integrity was a great strength. He could, like Adam Smith's 'impartial spectator', 'be more indifferent about the applause, and, in some measure, despise the censure of the world; secure that, however misunderstood or misrepresented, he was the natural and proper subject of approbation'.⁴²

Visitors to Charles's room encountered an impossible austerity, a clear reflective empty desktop, with everything else strictly in its appointed place. The master of his own desktop conveys mastery in wider spheres as well. Charles had the imagination to mobilise the personal goodwill that was latent within academic structures, and the moral authority to appeal to it. At York in the 1980s, he expanded the department of economics, promoted its best scholars, and added younger ones, at a time when universities were stagnating. He enjoyed the challenges of university politics and this large and lively department. He did not fare so well with his immediate colleagues, the economic historians. He found some able scholars and appointed some younger ones, but a small number resented Charles and the people he appointed, and thwarted his plans from time to time in group meetings. Such frictions hurt—spite was not so transparent to Charles, perhaps because he had little of it in himself. Those tensions made it easier for Charles to think of moving on, despite his achievements at York.

⁴¹ C. H. Feinstein (ed.) *York 1831–1981* (York, 1981).

⁴² Adam Smith, *The Theory of Moral Sentiments*, ed. D. D. Raphael and A. L. Macfie (6th edn. 1790; Oxford, 1976), Bk. III, i. 5.

After another year at Harvard (1986–7), Charles took an appointment as Reader in Social and Economic History at Oxford, and Fellow of Nuffield College. In 1989 he was elected to the Chichele Chair of Economic History, at All Souls College. Anne continued to publish extensively in the history of health and welfare, and took her place as a Professor in the thriving and distinguished history department of Oxford Brookes University. As the leader of economic and social history at Oxford, Charles pursued the truth as he understood it, but also understood that there were different ways to the truth. His own approach, which gave evidence primacy over theory, gave him a genuine respect for disparate visions, and for the people who held them. This allowed him to establish a large and heterogeneous economic and social history community, a broad church which embraced ostensibly incompatible approaches ranging from the analytical to the anecdotal, from the mathematical to the postmodern. In his role as a supervisor of last resort to doctoral students, he likewise often ventured beyond his own field, without prejudging the legitimacy or importance of any serious investigation.

When I arrived at York as a lecturer in 1978, I sat in on his first-year lectures on the post-war British economy. There was a limpid logic there, a compelling story which carried the listener along. His former student Ian St John recalls how ‘the patient, authoritative and easy manner with which Charles conveyed the results of his research made everyone present feel that they, too, were sharing in an intellectual journey that mattered deeply’.⁴³ Those lectures presented narratives in which simple growth theory, more Kuznets than Solow, framed the intractable dilemmas of British economic decline. The first instance of this, the puzzles of the so-called ‘climacteric’ of the late-Victorian period, and the question of entrepreneurial performance, already featured in his doctoral dissertation. It was thrilling and alarming to hear his account of industrial relations in the 1970s. Charles took a great deal of trouble over these lectures, and was proud of their popularity and impact. Tim Leunig attended them twice in Oxford. In common with several other gifted undergraduates there, he was inspired by Charles to seek a career in economic history. Charles’s legacy as a teacher endures in the masterly design of the Oxford postgraduate courses that he introduced, and was recognised by the award in 2003 of the Jonathan Hughes Prize for teaching by the American Economic History Association. As a writer as well, Charles began to range beyond national accounting. He edited several collections

⁴³ Ian St John, ‘A student’s recollections of Charles Feinstein’, unpub., n.d. [2005].

of articles and essays, and wrote a study of the inter-war economy jointly with Peter Temin and Gianni Toniolo.⁴⁴

Unlike McCloskey in 1970, Charles understood from the outset that expectations and emotions had an effect on the work effort:⁴⁵ ‘The root of the problem in the British economy was to do with labour relations and a combination of attitudes on the part of the workforce that were detrimental to productivity, reinforced by employers’ refusal to recognize what would have been necessary to overcome those attitudes’, he told Mark Thomas.⁴⁶ These class-rooted attitudes were also ‘an extremely powerful factor in Britain’s early post-1945 problems’. He participated in the CLARE group of economists who agonised over economic decline in the late 1970s.⁴⁷ He made some headway on a history of the British economy in the post-war years, but the book was not completed. In conversation (and at his lectures), it struck me how strongly he felt about these dilemmas, and what he saw as the mindless unreason of the unions. He actively supported the Social-Democratic Party (SDP) when it broke away from Labour in 1981, but he moved no further to the right. When Margaret Thatcher announced her resignation in 1990, ‘Charles was fairly jiggling around the room with delight’.⁴⁸

Charles stood up for academic diversity and freedom. The University of York produced a draft mission statement, which included an objective that ‘the University should serve the needs of the government’. Charles insisted that it might be the university’s duty to oppose governments and had the clause removed. When the registrar at York tried to rescind a visiting fellowship for the whistleblower Clive Ponting, Charles insisted that it should stand.⁴⁹ In conversations over the years, he surprised me several times with a robust endorsement of an acquisitive and self-interested human nature. He had a taste for hard-nosed self-regarding theories of motivation, whether Marxist or neoclassical (like his mentor Maurice Dobb, who expounded both versions at Cambridge). But (again like Dobb), his own personal practice belied these beliefs. By instinct he was a giver, not a taker. At Cambridge he empathised with rebellious students. At York, despite the burdens of a department, a chair, and a journal, he undertook as much teaching, and possibly more, than anyone else. When faced with a crisis, Charles did not to look for someone to

⁴⁴ C. H. Feinstein, Peter Temin and Gianni Toniolo, *The European Economy between the Wars* (Oxford, 1997).

⁴⁵ McCloskey eventually explored the effects of emotion much further than Charles ever did.

⁴⁶ Thomas, ‘Interview’.

⁴⁷ R. C. O. Matthews and J. R. Sargent (eds.), *Contemporary Problems of Economic Policy: Essays from the Clare Group* (London, 1983). Membership extended well beyond Clare College.

⁴⁸ St John, ‘A Student’s Recollections’.

⁴⁹ Ron Weir to Anne Feinstein, 22 Dec. 2004.

blame, but rolled up his sleeves; at Oxford he once volunteered for the time-consuming job of Secretary of the Social Studies Faculty, although his appointment was in History. Teaching statistics to graduate historians had been a recurrent problem at Oxford. After several years of frustration, Charles took a sword to this knot. Only a few years short of retirement, he set aside a summer and wrote from scratch an original textbook of quantitative methods for historians. He then taught this demanding course himself, over and above a full load he was carrying already. Charles worked with Mark Thomas to revise and extend it and as a published textbook it continues to lead its field.⁵⁰ Charles gave readily to the wider community, and spent many hours on the councils of the Economic History Society, the Royal Economic Society, as Section Chair and Vice-President of the British Academy, as an advisor to the ESRC and to the University Grants Committee, and on the investment committee at All Souls.

V

To pick up the thread of Charles's research: after working for so long on productivity and capital formation, he turned to welfare after all. Capital formation had become 'rather arid; one was dealing with things that had no human interest, whereas once I got started on issues of wages, that opened up questions such as the standard of living'.⁵¹ The 'Williamson curve' controversy had a bearing on what had been the most salient debate in British economic history during its golden age of the 1960s, between 'pessimists' and 'optimists', about the effects of the industrial revolution on the living standards of British workers. It was the height of the cold war. Led in Britain by Max Hartwell, the 'optimists' regarded rising standards of living as the vindication of capitalist industrialisation. The 'pessimists' were led by two brilliant left-wing historians, Eric Hobsbawm and E. P. Thompson, who were not comfortable with numbers, and stressed the unmeasured detriments of industrial and urban life. Hartwell was somewhat more numerate, and the debate drew mainly on the fragmentary surviving evidence of prices and wages. By the 1970s it seemed that the optimists had won it on points. Charles took no part in this debate. He was not yet an historian.

⁵⁰ C. H. Feinstein, and Mark Thomas, *Making History Count: A Primer in Quantitative Methods for Historians* (Cambridge, 2002).

⁵¹ Thomas, 'Interview'.

After his work on capital formation, wages and profits remained the main components still missing for estimating national income during the industrial revolution. Estimating real wages had several attractions for Charles. His nineteenth-century wages series had come almost entirely from the work of predecessors. Charles now decided to reconstruct the series himself from the primary sources upwards. He had previously questioned the 'optimistic' assessment of wage growth represented by Williamson's book. Another approach to the standard of living had emerged in the 1990s. Human heights appeared to provide an index of well-being which might capture childhood deprivation. Historical height data assembled by Floud, Wachter and Gregory showed that during the first half of the nineteenth century, when the standard of living might have been expected to rise, heights had actually diminished. Some optimists retreated into an ad hoc defence that the decline in heights might have reflected a preference for other goods rather than those that enhanced health.

Charles extended wage series back to the eighteenth century. Four articles on wages came out between 1990 and 1998, and the effort culminated in his magisterial Tawney lecture of 1998, 'Pessimism Perpetuated'. This (and the article based on it which followed) re-examined Williamson, and concluded that the pessimists had been right all along: real weekly working-class earnings lagged far behind the growth of the economy during the first seventy-five years of modern economic growth and broadly stagnated until the 1830s.⁵² It may also be seen as the closing of a circle, bringing Charles back to the social-justice preoccupations of his youth and, for those who only knew him later, an unexpected alignment with the left-wing historians of the 1960s. Charles himself denied that this was his intention—he did not know, he said, where the findings would lead—but he was not dissatisfied.

A more open return to his roots had already begun. As an opponent of apartheid, Charles had never been able to return to South Africa. He was thrilled by its overthrow in 1990, went back to visit, and felt the tug of his youthful ideals. Starting in 1992, he began to spend the months of the summer vacation in South Africa. In most years he taught a course in economic history at the University of Cape Town. He and Anne purchased a house on the slopes of Table Mountain, which became a source of pleasure and a base from which to participate in the country's transformation. Anne also began to work on South African topics. After

⁵² Charles H. Feinstein, 'Pessimism perpetuated: real wages and the standard of living in Britain during and after the Industrial Revolution', *Journal of Economic History*, 58:3 (Sept. 1998), 625–58.

retirement from Oxford, even more of their time was spent there. In 2002 he began an overview study of South African economic history. None had been written for a long time. The end of apartheid offered a chance to understand the distortions it had inflicted. He presented the Ellen MacArthur Lectures in Cambridge in 2003 and converted them into his book on South Africa the following year. It appeared just too late for Charles to enjoy the praise it received.⁵³

When Charles retired in 1999, he stood at the pinnacle of the discipline, admired and respected by a wide circle of colleagues and students, family and friends. He was celebrated with a retirement conference in 1999, and a Festschrift in 2003.⁵⁴ Retirement was darkened by illness, which he endured with stoic courage. But the burdens of administration had lifted, and those final years became among his most productive. In addition to the South African volume, and to writing up his statistical textbook for publication, he embarked on another grand project, a 'social accounting matrix' for the UK in 1851. Input–output analysis had been devised by Leontief in the 1930s to trace the supply chains in the economy and their mutual interaction. In the 1960s Richard Stone recast the national accounts in the form of an extended input–output matrix, which included productive factors, households, intermediaries, government, and international flows in addition to industries. This was adopted into the UN national income standard in its revision of 1968.⁵⁵ Effectively it was also a form of general equilibrium analysis, and highlighted similarities with the neoclassical equilibrium modelling approach, with which of necessity it coincided at many points. In its painstaking, encompassing detail, Charles's final project was nevertheless a valedictory statement of his belief that understanding was not to be found in overarching theory, but in empirical knowledge, disciplined within an accounting framework. A complete input–output table for 1851 would push our secure knowledge of the economy back by more than half a century. It was four-fifths completed at his death on 27 November 2004, and is due to be finished by his long-standing collaborator Mark Thomas.⁵⁶

It was not easy to get to know Charles as a person. Despite unmistakable warmth and sympathy, he was private and reserved, and small

⁵³ C. H. Feinstein, *An Economic History of South Africa: Conquest, Discrimination and Development* (Cambridge, 2005).

⁵⁴ Paul A. David and Mark Thomas (eds.), *The Economic Future in Historical Perspective* (Oxford, 2003).

⁵⁵ Frits Bos, 'The history of national accounting', Netherlands Central Bureau of Statistics, National Accounts Research Division, Occasional Paper 48 (1992), 24–5. Vanoli, *History of National Accounting*, pp. 169–71.

⁵⁶ C. H. Feinstein and Mark Thomas, *The Mid-Victorian Economy: Making, Earning and Spending in the United Kingdom in 1851* (Cambridge, forthcoming).

talk was often an effort. During his last few months, he let down his guard a little, and we had several long conversations. There was a cultured side to Charles, a love of music and literature (Haydn, Bruckner, Paul Celan), which he kept hidden from colleagues. Now he was rereading the novels of Trollope, and we talked about them. It has struck me since that there were affinities between the two men. I think of them both as engineers, each with his own distinctive approach to the same Victorian infrastructure. Trollope, apart from being a novelist, had been a senior official at the Post Office. He devised the red pillar box, and established universal deliveries in Britain. Charles in his turn deconstructed the Victorian economy and reassembled it as a dynamic machine. Trollope's novels convey a sense of stability and order. Underneath the surface narrative, society rolls along in firm grooves of convention, habit, and self-interest. Charles revealed a similar incremental regularity in economic life. But on almost every page, Trollope also wove in the nuance of emotion and personality, without succumbing to sentimentality. Charles had a similar kind of emotional intelligence in his leadership roles, robust, broad-hearted and broad-minded. This underpinned his authority as a colleague and administrator, and his appeal as a teacher and friend. He was not only respected, but also loved. He was an immensely able man, and also a good and moral one. His accomplishment endures.

AVNER OFFER

Fellow of the Academy

Note. My own experience of Charles was as my senior colleague at York and then at Oxford, since 1978, with a gap between 1986 and 1991. The main sources for this memoir, in addition to this personal experience and to library research, are the obituary in *The Times*, 23 December 2004 (also written by me), Nicholas Dimsdale's obituary in *The Guardian* (29 December 2004), Mark Thomas's 'Interview' (see above, n. 3); the All Souls 'Memorial Meeting' (see above, n. 2) and the contributions therein by Bob Hepple, Paul David, myself, Tim Leunig and Anne Digby; a transcript of the funeral service kindly provided by Alan Stein (see above, n. 1); letters to Anne Feinstein from Ron Weir and John Hutton, and to myself from Ian St John; conversations, comments, and communications from Anne Feinstein, Leon Feinstein, Ruth Loshak, Robin Matthews, John Hutton, Peter Temin, and Mark Thomas. I have silently borrowed a few felicitous phrases, but longer citations are attributed. Other friends have kindly read the text and have helped to improve it. Charles's own publications are listed as an appendix to this memoir in its version as an Oxford discussion paper <<http://www.history.ox.ac.uk/ecohist/index.htm>>. I have provided sources for direct quotations. To save on space, not all publications mentioned are fully referenced, but there is sufficient information for tracing them using standard academic search methods.