ALAN WILLIAMS

Alan Harold Williams
1927–2005

ALAN WILLIAMS WAS, by common consent, the leading health economist in Britain. Indeed, it is in large part due to him that there is a community of health economics for anyone to lead. He was renowned for the logical rigour of his thinking, for his passionate commitment to the principle of universal health care supplied according to need, for his determination to ensure that health-service resources are used to the best effect, and for his evangelical sense of mission in advocating the use of the quality-adjusted life year as a measure of health-service effectiveness. He was also famous for the notice on his desk—later moved to his door so that callers would be forewarned of what to expect—with the injunction: 'Be reasonable—do it my way.' That so many people remember this message shows that it was something more than an office joke.

Alan was born in the Ladywood district of Birmingham on 9 June 1927, and spent his childhood and teenage years there. The Williams family ran an off-licence shop in this working-class part of Birmingham, living on the premises. As the owners of a small business, they were a cut above their neighbours, distinguished by their early acquisition of an inside toilet, an Austin Seven car and a telephone. The young Alan was weedy and had a stammer, and was bullied at the local infants' and junior schools. However, he must have shown intellectual aptitude, as he won a scholarship to Five Ways Grammar School, a satellite of the prestigious and academic King Edward's School. The foregoing information comes from an autobiographical note which Alan began writing in later life, but which never got beyond the event of the scholarship—perhaps partly because, with characteristic attention to detail, he had devoted much of his authorial energies to reconstructing the complete rules of the

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Ladywood version of the street game of 'tip-cat' that he had played as a boy.

Alan spent the war years as a pupil at Five Ways School and, after his School Certificate and with another scholarship, at King Edward's School itself. Half a century later, he recalled that, as a result of his experience of wartime Britain, the concept of rationing was for him 'benignly synonymous with distributing scarce resources equitably'.[1] Throughout his life, his social and political outlook retained some of the spirit of the 1940s—an ideal of social solidarity, a deep but not doctrinaire commitment to equality, a confidence in the ability of a well-advised government to improve life for everyone, and an almost instinctive affection and support for the National Health Service.

Alan left school in 1945 with Higher School Certificate qualifications (the predecessors of 'A' levels) in Spanish, French and English. He was then required to do a period of National Service. He spent almost three years in the RAF, mostly behind a desk in Algeria, leaving with the rank of corporal. It seems that this was a pleasurable interlude in his life. On demobilisation leave in Birmingham in 1948, he had a night out at the local Tower Ballroom and met his future wife June Porter, a grammar-school girl from another part of the city.

The RAF had an enlightened policy of trying to make up for the disruptive effect of National Service on the education of its conscripts. As a result of this policy, Alan was offered financial support to go to university, something he had not previously thought of doing. With an eye to future employment prospects, he opted for a degree course in commerce. Possibly for reasons of economy, possibly out of loyalty to his family, he chose to live at home and study at the University of Birmingham.

It was at Birmingham University that Alan discovered economics. He was particularly inspired by a young economics teacher called Frank Hahn, only two years older than Alan himself, who delivered brilliant lectures without notes, and with cliff-hanger endings to arouse his students' curiosity about what would come next. Alan was a successful student, graduating in 1951 with an upper second, having narrowly missed a first (in an era when a first was a very rare honour). He considered a career in the civil service, entering the difficult competition for the administrative class and emerging with a job offer. By this stage, however, he must have decided on an academic career, since he turned the offer down and took

[1] Alan Williams, 'Discovering the QALY—or how Rachel Rosser changed my life', in Adam Oliver (ed.), *Personal Histories in Health Research* (London, 2005).

a one-year research post at Birmingham University. With help and encouragement from Hahn, he spent this period preparing, and raising finance for, an ambitious plan which was intended to lead to a Ph.D.

The idea was that Alan would go to the University of Stockholm, put his language skills to use by learning Swedish, and then translate into English some of the work of the great Swedish economist Knut Wicksell. At this time, Stockholm was one of the world's most famous centres of economics. The 'Stockholm School' of economists had made major developments in macroeconomics in parallel with those of John Maynard Keynes in Britain. The exchange of ideas between the two countries had been disrupted by the war, and now there was a desire to reconnect. Wicksell's theory of capital and interest, which synthesised ideas from the Walrasian and Austrian traditions of neoclassical economics, was a point of reference for the Stockholm School, and gave a perspective on what was then one of the major theoretical problems of the discipline—reconciling Keynesian macroeconomics with neoclassical microeconomics. Wicksell was also one of the founding fathers of public finance. His theory of 'just taxation', later developed by another Swedish economist, Erik Lindahl, is based on the principle that, in order for the tax-financed supply of public goods to be just, every individual must be a net beneficiary from the combination of taxation and public-good consumption. Among the public-finance economists who were influenced by this idea were James Buchanan, later to become the leading figure in the economics of public choice, and Alan Peacock, who was to play an important role in Alan's later career.

Alan went to Sweden in 1952. Finding it difficult to immerse himself sufficiently in Swedish-speaking life at the cosmopolitan University of Stockholm, he transferred to the University of Uppsala. Starting his work on Wicksell, he began to make a few scholarly discoveries, such as a significant error in one of the standard German translations of Wicksell's writings. But then, a year into his project, he was struck by the disaster that all Ph.D. students fear: he discovered that another young British economist, Ralph Turvey, had been working for some time on the same translations. Realising that his own work no longer had a purpose, Alan abandoned his Ph.D. research, returning to England in the summer of 1953.

For the rest of his life, Alan retained a love of Sweden. This was more than a natural nostalgia for a country in which he had spent a happy year in his twenties. He saw Sweden's form of social democracy—in which a comprehensive welfare state coexisted with economic growth, and high

rates of taxation seemed to be accepted in a spirit of social solidarity—as a model for the rest of the world. Until English became the unchallenged world language for economics, Alan continued to use his Swedish-language skills by making for the *International Economic Papers* an annual series of English translations of major current papers in economics. He succeeded Turvey as the member of that journal's editorial board with responsibility for trawling the Scandinavian literature. Much later, he played an important part in the development of health economics in Sweden. Alan's contribution to Swedish economics was given fitting recognition in 1977, when he was awarded an honorary D.Phil. by the University of Lund.

Back in England, Alan applied for a lectureship in economics at the University of Exeter, and was successful. In November 1953 he and June were married, and they moved to Exeter together when Alan took up his position in January 1954. The following years were busy ones for the Williams family. Alan and June's three children were born (Mark in 1956, Susan in 1959, Paul in 1961). Through the intermediation of a friend who now worked at the Massachusetts Institute of Technology, Alan was a visiting assistant professor at MIT in the academic year 1957–8. With Mark only a baby, crossing the Atlantic by ship and then living for a year in America was a huge family adventure. For Alan, it was also an intellectual adventure: he was able to walk into the office of Paul Samuelson, arguably the greatest economist of the day, for casual discussions.

After this experience of MIT, it was difficult for Alan not to find Exeter dull. In fairness to the University of Exeter, however, it should be said that Alan's own research output in this period was hardly exciting. His most significant work was *Public Finance and Budgetary Policy*, published in 1963 as one of a series of 'student handbooks'.[2] This is an introduction to public finance, intended for advanced undergraduate students. The emphasis is on issues of tax incidence, and on the economically distorting effects of different forms of taxation. The method of analysis is firmly neoclassical, by means of geometrical proofs in what now seem frighteningly complicated diagrams, often in three dimensions. The most distinguished journal publication of Alan's Exeter years was a short, workmanlike paper in *Economica* on the possible effects of a current proposal to abolish local government taxation of agricultural and industrial property.[3]

[2] Alan Williams, *Public Finance and Budgetary Policy* (London, 1963).

[3] Alan Williams, 'The abolition of derating: an exercise in differential incidence', *Economica*, 90 (1956), 150–7.

Some time around 1960, Alan began to work on an intellectually more promising project, growing out of his previous work on local government finance in Britain. In what was then the received theory of public finance, 'government' was represented as a unitary agency, choosing tax rates and levels of public spending so as to maximise some index of social welfare. Around this time, however, there was a growth of interest among economists, particularly in the United States, in 'fiscal federalism'—that is, the inter-relationships between the fiscal activities of different tiers of government. Alan's idea was to adapt the 'pure' theory of public goods, recently developed by Samuelson, to the case of two-tier government. This opened up the prospect of making a contribution to economic theory which could engage an international audience.

Determined to make the most of this opportunity, Alan invested some of his family's very limited resources in travelling to Istanbul to present his work at an International Institute of Public Finance conference. (The University of Exeter had offered to pay only his third-class rail fare—a decision which rankled with Alan for the rest of his life.) The investment paid off. Alan made himself known to the international public finance community as someone doing important work on fiscal federalism. His work impressed Richard Musgrave, the leading figure in public finance at that time, and he received an open invitation to visit Musgrave's department at Princeton. Early drafts of his paper began to circulate among public finance specialists around the world.

Like many other British academics of his generation, Alan was a beneficiary of the Robbins expansion of the university system. The new University of York took its first intake of students in autumn 1963 and, well before then, its first professors were recruiting academic staff for their departments. Developments in economics were under the effective control of Alan Peacock and Jack Wiseman. Both had reputations in public finance, and naturally wanted this area of economics to be one of the specialisms of their department. Both were also known for their inclinations towards what, in the context of the time, was seen as right-wing, free-market economics. Sensibly, they recognised that their own style of public finance was a minority taste and wanted to build their departmental specialism on a broader base. As a relatively young but recognised public finance economist, with a tendency to favour an active role for government in the economy, Alan looked a promising prospect. In late 1962 or early 1963, Alan was tentatively approached by Wiseman with the opening remark: 'I suppose you're well settled in Exeter?' Alan, for whom this approach was a complete but entirely welcome surprise, indicated

that he was not *so* well settled, and shortly afterwards he was being interviewed in York. According to Peacock, after the candidate had left the interview room, Wiseman said: 'We must have him with us—but he'll be a bloody nuisance.'

Alan was offered a senior lectureship, to start eighteen months later, and he accepted. He immediately handed in his notice at Exeter and took up the invitation from Musgrave, spending the academic year 1963–4 as a visiting professor at Princeton. This time there was a family of five to enjoy the experience of living in America, with the added excitement of driving across the continent to Berkeley, where Alan taught at a summer school in 1964. While in Princeton, Alan completed his theoretical paper on fiscal federalism, which was published in the *Journal of Political Economy* in 1966.[4] This was the high point of Alan's career as a public finance theorist. The paper is an elegant extension of Samuelson's theory of public goods in the form of a model in which central and local government decisions interact. It uses Alan's preferred technique of complicated geometrical proofs and leads to a mildly surprising result, induced (as such results often are in neoclassical analysis) by the possibility that income effects can outweigh substitution effects. Reading the paper forty years later, one can still see why it established Alan's reputation as a rising star in public finance. At the same time, one does not get the sense that the author is deeply engaged in this theoretical exercise: there is none of the passionate commitment of Alan's later work.

Alan moved to the University of York in the autumn of 1964, the second year of its existence. He remained there for the rest of his life, successively as senior lecturer, reader and (from 1968) professor. From the beginning, he enjoyed the stimulating atmosphere of the newly created economics department. Alan Peacock was proving an inspired appointment as head of department, his sense of direction and institution-building skill camouflaged by a deceptively easy-going style. Peacock encouraged creative diversity in approaches to economics. Ideologically speaking, Alan Williams's inclination to be a bloody nuisance was given free rein.

Nevertheless, the true turning-point in Alan's career was not the move to York; it was the two-year period between 1966 and 1968 which he spent on secondment to the Treasury. His job description was 'Director of Economic Studies' at the Treasury's Centre for Administrative Studies

[4] Alan Williams, 'The optimal provision of public goods in a system of local government', *Journal of Political Economy*, 74 (1966), 18–33.

(later the Civil Service College). In that capacity, he devised and taught courses in economics for senior civil servants. In addition, he was asked to undertake a series of one-off commissions for various government departments which did not have economists of their own. As Alan later described it, this work was partly that of an odd-job man in the Government Economic Service and partly that of a 'Treasury spy', making reconnaissance missions to discover how other departments were making their spending decisions.

As the designer of short economics courses for busy civil servants, Alan was forced to consider what were the absolute essentials of the discipline that decision-makers needed to understand. In his roving commissions, he gained experience of a wide range of decision problems that the government machine had to deal with, and had to think creatively about how economic analysis could contribute to their solution. As the combined result of these two elements of his work, he developed a distinctive conception of the role that microeconomics can and should play in public decision-making; he maintained this position, at least in broad outline, for the rest of his career.

He seems to have concluded that, for the purposes of public decision-making, the essential core of microeconomics is the analysis of constrained maximisation. First and foremost, rational decision-making requires well-specified objectives and constraints: one has to decide what one wants to maximise, subject to what constraints. The maximand must be a desired *output* of the relevant system, not a measure of input or throughput. Alternative policy options must be understood as different ways of using scarce inputs to produce the desired output. Microeconomic analysis is then concerned with achieving efficiency in transforming inputs into output.

On this understanding, microeconomics and operations research are closely related. Of the two main techniques that Alan recommended for use in government, one (output budgeting) came primarily from operations research, the other (cost–benefit analysis) from economics.[5] Output budgeting is a method of organising the accounts of an agency so that desired outputs are defined and then the agency's costs are attributed to the outputs which they produce. Cost–benefit analysis, as understood by Alan, appraises specific policy options in terms of their marginal costs and their marginal contributions to desired outputs, and makes inputs

[5] Alan Williams, 'Output budgeting and the contribution of micro-economics to efficiency in government', CAS [Centre for Administrative Studies] Occasional Paper no. 4 (1967).

and outputs commensurable by expressing both in money units, discounted to present values. Crucially, the money values placed on units of output are expressions of the priorities of the decision-making agency, not measures of anything external to that agency. The main function of these 'postulated' money values is as shadow prices, that is, as signals which assist the pursuit of efficiency in achieving given objectives. Alan defended this account of cost–benefit analysis in a forceful paper in the first volume of the *Journal of Public Economics*.[6] It also appears as what is called the 'decision-making approach' in a textbook on cost–benefit analysis that he and I later wrote together.[7]

This form of constrained maximisation is a ruthlessly edited-down form of microeconomics, which abstracts from many issues that other economists would have seen as relevant for public decision-making. Cost–benefit analysis was a fashionable topic in economics in the 1960s and 1970s, but much of the profession's effort was directed towards finding ways of inferring private individuals' valuations of public-sector outputs from observations of those individuals' choices in relevant contexts (or, sometimes, from their responses to survey questions). Such a preference-based approach is closer in spirit to the public finance of Wicksell and Lindahl than is Alan's operations research. By the end of the 1960s, economists were beginning to become interested in *social choice*, understood as the problem of aggregating the separate preferences of individual citizens into a single system of consistent 'social preferences'. Alan's methodology short-circuits these problems by treating the valuation of the outputs of public policies simply as a matter for decision-makers' own judgements. Another set of issues concerns the motivations of public decision-makers. The economics of *public choice*, also getting under way by the late 1960s, models government itself as a system of rules within which politicians and bureaucrats pursue their private interests. This leads to the idea that procedures of public decision-making should be designed so as to provide incentives for decision-makers to act in the public interest. In contrast, Alan's approach takes the viewpoint of the

[6] Alan Williams, 'Cost–benefit analysis: bastard science? and/or insidious poison in the body politick?', *Journal of Public Economics*, 1 (1972), 199–225.

[7] Robert Sugden and Alan Williams, *The Principles of Practical Cost–Benefit Analysis* (Oxford, 1978). Although I was the main author of this book, its basic structure was laid down by Alan; I think it derived from courses he had taught at the Centre for Administrative Studies. The decision-making approach is presented alongside an alternative 'Paretian approach' which, by the time we finished the book, I had come to favour.

decision-makers themselves, accepting as unproblematic their postulated valuations of public-sector outputs.

By abstracting from these other issues, Alan was able to isolate problems that were susceptible to rigorous analysis according to economic principles of constrained maximisation. On Alan's account, identifying a decision-maker's problem is not a straightforward task: 'any practitioner [of operations research or cost–benefit analysis] who accepts the client's initial formulation of the problem uncritically is heading for disaster'.[8] In particular, most public organisations find it easier to characterise what they do than to identify those effects of their activities that are ultimately valuable. But by pressing decision-makers to specify their problems within a framework of constrained maximisation, Alan was able to expose ambiguities and confusions in their thinking. His single-mindedness in insisting on this framework and the remorseless logic with which he organised arguments within it were indeed captured by the famous motto about being reasonable and doing it his way.

These features of Alan's approach are well illustrated by the story (as ruefully told by Alan himself) of his first involvement with health economics.[9] The Treasury had sent him to the Ministry of Health to look at the ongoing hospital-building programme and to estimate when, given the criteria being used to decide on the need for new hospitals, the programme could be expected to tail off. The results of Alan's first enquiries suggested that no obvious criteria *were* being used, except the general principle of replacing hospitals that were judged to be 'old' (a vague concept, as most hospital sites had buildings of many different ages) and a rough notion that different areas of the country should take turns in getting new hospitals. So the Treasury asked Alan to propose suitable criteria. As a well-trained economist, he started from the assumption that capital and other inputs are substitutes, with the implication that as buildings age, the capital stock deteriorates and running costs increase; eventually a time will be reached at which it is less costly to rebuild than to continue using old buildings. But then Alan discovered that new hospitals had *higher* running costs than old ones. So, he asked the officials in the Ministry of Health, were new hospitals more effective than old ones? They were unable to say. Asked whether the construction of a new hospital improved the health of the population in its catchment area, they

[8] 'Cost–benefit analysis: bastard science?', p. 204 (see above, n. 6).

[9] Alan Williams, 'All cost effective treatments should be free . . . or, how Archie Cochrane changed my life!', *Journal of Epidemiology and Community Health*, 51 (1997), 116–20.

knew of no evidence, but guessed any effect would be small. With his usual logic, Alan concluded that the hospital building programme was probably a bad investment, and reported this to the Treasury.

Alan's Treasury superiors then indicated to the Ministry of Health that this finding might have repercussions for the funding of its capital programme. The Ministry responded by bringing in figures from the medical and scientific establishment, who insisted that it was well-known to experts in the field that new hospitals *were* more effective than old ones; evidence would be superfluous, but if the Treasury really felt it was necessary, could they specify what evidence was needed and how it might be collected? Alan went away and started work on constructing a population-based measure of health status which could be used as the basis of an output measure for hospitals. His first ideas were rejected as impractical by the Ministry. Then, in the usual civil service way, the Treasury lost interest and sent Alan off on another job.

Alan returned to York in 1968. It was at this stage in his career that I first met him. I was an undergraduate student in history and economics. Among the economics students, Alan was generally regarded as their best lecturer. He was not a charismatic performer, as Hahn had been at Birmingham. For most students (I was an exception in this respect), the topics on which Alan lectured—welfare economics and investment appraisal—were not particularly exciting. He was just exceptionally lucid and well-organised, and tailored his lectures to the abilities of his audiences. Alan supervised my final-year project, a retrospective cost–benefit study of a railway branch-line closure. He went far beyond the requirements of duty in helping me to get started. I recall his accompanying me to a meeting with a senior railway official, at which Alan's reassuring bureaucrat-to-bureaucrat mode of operation gained me access to the data I needed. (He must have been a very effective Treasury spy.) When I claimed that I had found a theoretical error in the Ministry of Transport's cost–benefit methodology, Alan listened to me patiently; when he had been convinced, he encouraged me to write what became my first publication. It is hard to imagine any undergraduate student being given so much attention by a professor today, but even in the 1960s this was very unusual. However, it was typical of Alan. Later, the help he gave to successive cohorts of trainee health economists led to many continuing friendships and professional relationships, and is part of the explanation of his eventual role as what one obituary described as a 'grandfather' of health economics.

I have said that Alan was not charismatic; in terms of his style at this time, that is an understatement. This was the period in which universities were at their most fashionable, and new universities like York were the most fashionable of all. Alan did not look like anyone's idea of a sixties professor. He dressed in a way that would have merged with the background in a civil service office of the time. His style of dress—serviceable jackets and ties of indeterminate colour, neither smart nor casual—remained constant over the thirty-seven years I knew him. Other professors came to work by car, but Alan drove a large blue Bedford van, more suitable for a parcel delivery service. (Eventually, this was replaced by a series of much-loved Volvos, but this move up-market was made only because the newer designs of Bedford van would not fit into his garage.) When transferred to intellectual matters, Alan's lack of concern for appearances was one of his great strengths. He was immune to the forces of fashion which govern so many developments in economics: once he had found a problem that he thought important or a method that he thought would work, he pressed on regardless of its status among his fellow economists.

To return to the main story: it turned out that Alan's arguments at the Ministry of Health had had more effect than he had thought at the time. In 1970, two years after leaving the Treasury, Alan was phoned by Archie Cochrane, Director of the Medical Research Council's Epidemiology Research Unit. Cochrane had been one of the medical experts who had helped the Ministry of Health to repulse Alan's reconnaissance mission. He enquired about the progress of Alan's investigations of effectiveness measures for health care. In fact, nothing more had been done: at this time, Alan's efforts in cost–benefit analysis were mainly directed towards the water industry. Cochrane set about persuading him to return to his unfinished work on health care, as part of a research project funded by the Nuffield Provincial Hospitals Trust. Alan agreed. That marked the start of his transition from public finance to health economics.

The first main product of this work was a paper on 'social indicators' for health, co-authored by Alan and two of his York colleagues, Tony Culyer and Bob Lavers, and published in 1971.[10] This remarkable paper provides the outline of an 'index of ill-health' based on two dimensions, 'painfulness' and 'degree of restriction of activity'. For each dimension, there is a set of different qualitative descriptions, arrayed in order of pain

[10] Anthony Culyer, Robert Lavers and Alan Williams, 'Social indicators: health', *Social Trends*, 2 (1971), 31–42.

or restriction. This defines a two-dimensional space of health states. Any given medical condition can be located in this space. An index can then be created by using judgements of equivalence between different points in the space, and judgements about the relative badness of different points. These judgements provide the *weights* for the index. Significantly, they are treated as 'statements about *health policy* . . . to be made by whoever is entrusted with that responsibility—e.g. "the Minister"'. The authors then show how two alternative prognoses for a patient ('with treatment' and 'without treatment') can be plotted as graphs of ill-health (measured by the index) against time. The effectiveness of treatment is measured by the net gain in units of health × time. This, in its essentials, is a methodology for creating a measure of quality-adjusted life years (QALYs), although this term is not used.

It seems that, at some time after this work on social indicators, Alan began to think that health measures should take account of judgements about the relative values of different health states made by members of the general public. This marks a significant change from the position Alan developed in the Treasury, namely that valuations are to be postulated by public decision-makers as expressions of government policy. Perhaps this change of perspective was a delayed effect of moving from the heart of the government machine to the position of someone arguing for reform from the outside. However, Alan continued to maintain that the weights used in a health-state index should be understood as collective judgements about relative need, whether these are expressed by responsible decision-makers or by individuals as citizens. In all his work in health economics, he has resolutely rejected the idea that the distribution of health care should respond to differences in individuals' preferences or willingness to pay. Thus, when offering a 'guide through the ideological jungle' in relation to setting priorities in health care, he firmly declares his personal commitment to 'egalitarianism', characterised by the ethic of 'equal opportunity of access for those in equal need'.[11] In a discussion piece on age-based rationing, Alan poses the question: Whose values should count in a social insurance setting? He asks us to suppose that older people are willing to pay more than younger people for health improvements for themselves. Is that relevant for the setting of priorities in the NHS? Alan insists it is not:

[11] Alan Williams, 'Priority setting in public and private health care: a guide through the ideological jungle', *Journal of Health Economics*, 7 (1988), 173–83; quotation from p. 174.

> But did we not take the NHS out of that [private market] context precisely because as citizens (rather than as consumers of health care) we were pursuing a rather different ideal—namely, that health care should be provided according to people's needs, not according to what they were each willing and able to pay? A person's needs (constituting claims on social resources) have to be arbitrated by a third party, whose unenviable task it is to weigh different needs (and different people's needs) one against another. This is precisely what priority setting in health care is all about. So the values of the citizenry as a whole must override the values of a particular interest group within it.[12]

So Alan was looking for weights for a health-state index which could express citizens' judgements about relative need. He recalled that, in his work on output budgeting for the Home Office (another of the roving commissions of his Treasury period), he had come across an American index of crime seriousness which was based on ordinary people's judgements. He contacted an operations researcher, Vincent Watts (later to become the Vice-Chancellor of the University of East Anglia), who had helped him in his Home Office work, to try to find out more about this index. Watts told Alan that his wife, the psychiatrist Rachel Rosser, was currently developing an output measure for hospital treatment. Through Rosser, Alan learned about the work of other researchers around the world who were working on the design of health-status indices, based on individuals' preferences between health states, elicited by survey methods.

From this point, the Williams and Rosser projects coalesced. The 'Rosser index' became the template for Alan's subsequent work. It was based on two dimensions, 'disability' and 'distress'. Rosser had collected responses from a small convenience sample of doctors, nurses, patients and members of the general public, which could be used to construct an index of the relative value of being in each state. Alan had the idea of recalibrating these data to fit a scale on which 'dead' had a value of zero and 'full health' a value of one. This work was done by Paul Kind, one of Rosser's researchers who later moved to York, and published in 1982.[13] This index was the prototype QALY.

This is not to say that either the theoretical ideas or the survey methods underlying the QALY concept can be credited to Alan or to Rachel Rosser. The idea of a survey-based measure of health status had already

[12] Alan Williams, 'The rationing debate: rationing health care by age: the case for', *British Medical Journal*, 314 (1997), 820 (15 March).

[13] This was published as Paul Kind, Rachel Rosser and Alan Williams, 'Valuation of quality of life: some psychometric evidence', in Michael Jones-Lee (ed.), *The Value of Life and Safety* (Amsterdam, 1982).

been developed by researchers in the US and Canada.[14] Nevertheless, Alan was very early in recognising the potential for using such a measure to determine priorities in health policy, and he pursued this idea with his characteristic energy and single-mindedness. Much of the rest of his working life was devoted to making QALY measurement operational and transparent, and convincing policy-makers to use it. It is entirely just that, in the world of health policy, the QALY has come to be so inseparably linked with the name of Alan Williams.

In the decade from the mid-1970s, the main emphasis of Alan's work was on trying to convince the health policy establishment of the logic of the QALY approach. These efforts met with mixed success. He gained an important ally in Sir Douglas Black, the Chief Scientist at the Department of Health between 1973 and 1977 (and later author of the controversial 'Black Report' on social inequalities in health). Black invited Alan to serve on various of his advisory committees. By 1976, Alan had made a sufficiently favourable impression on the medical establishment to be deemed a suitable person to be a member of the Royal Commission on the NHS, set up in that year.

This proved to be a low point in Alan's career. Perhaps his impatience with compromise and preference for action over words were not adapted to the mode of working of a Royal Commission. It seems clear that there was a personality clash between Alan and the Commission's chairman, Sir Alec Merrison, a nuclear physicist who had become Vice-Chancellor of the University of Bristol, and who had previously chaired committees of enquiry into box-girder bridges and the regulation of the medical profession. Here is Alan's account of the episode:

> I found myself totally at loggerheads with the Chairman, Alec Merrison, over the Commission's role. I saw this as doing for the NHS what the Robbins Report had done for Higher Education, but he seemed to see it as some kind of holding operation in which all we had to do was to re-state basic principles and hold the line at a general strategic level. After a couple of years the tension got

[14] The paper which is now usually credited with initiating this research programme is S. Fanshel and J. W. Bush, 'A health-status index and its application to health-services outcomes', *Operations Research*, 18 (1970), 1021–66. Another founding father of health-status indices is George Torrance; see, e.g., George Torrance, Warren Thomas and David Sackett, 'A utility-maximization model for evaluation of health care programs', *Health Services Research*, 7 (1972), 118–33. In their pioneering paper on 'social indicators' (see above, n. 10), Culyer, Lavers and Williams acknowledge that their approach is 'fairly close methodologically' to that of M. Magdeleine, A. Mizrami and G. Rosch, 'Un indicateur de la morbidité appliquée aux données d'une enquette sur la consommation médicale', *Consommation*, 2 (1967).

too much for me and I quit, with a strong sense of inadequacy and personal failure.[15]

Some of Alan's main achievements around this time were in institution-building. It was in this period that the structure of health economics as a distinct sub-discipline began to emerge, and the University of York established its position as the leading British centre for teaching and research in the field. Alan played a central role in these developments, together with two younger colleagues, Tony Culyer and Alan Maynard. Alan was a co-founder of the Health Economists' Study Group, which immediately became the main academic forum for health economists in Britain; he remained one of its most active members for the rest of his life. Research in health economics at York expanded rapidly, first under the umbrella of Jack Wiseman's Institute of Social and Economic Research and then, from 1983, in the Centre for Health Economics. This is now a major enterprise, employing around forty researchers at any given time. In 1978, a master's programme in health economics was launched, which to date has trained over three hundred students. The *Journal of Health Economics* began in 1982, with Tony Culyer as one of the founding editors. There are very few health economists in Britain today who have not been associated with York in one way or another at some time. The cumulative effect of all this has been to produce a cadre of health economists with a strong sense of collective identity and a common intellectual tradition—a tradition on which Alan's ideas are imprinted. Without these developments, the idea that health-service decisions should be guided by economic analysis could not have been transformed into a feasible prospect.

As far as the QALY is concerned, the most important breakthrough came in 1985, with the publication of Alan's first paper in the *British Medical Journal*.[16] Twelve years later, as part of the commemoration of the first twenty-five years of health economics, experts were invited to make nominations for 'most influential publication'. This health economists' Oscar was awarded to Alan's *BMJ* paper.

The paper is less than four pages long and, revealingly, it appears in the 'For Debate . . .' section of the journal. The editors seem to be suggesting that the ideas being presented are not quite safe enough to warrant the *BMJ* seal of approval. The paper summarises a cost-effectiveness

[15] 'Discovering the QALY' (see above, n. 1).

[16] Alan Williams, 'Economics of coronary artery bypass grafting', *British Medical Journal*, 291 (1985), 326–9.

study of coronary artery bypass grafting (CABG). This study had been carried out by Alan and presented to an NHS enquiry into whether provision of CABG should be expanded. It uses the Kind/Rosser/Williams index to estimate the net QALY gain per episode of intervention, for different categories of patient. These estimates are combined with cost data to produce 'cost per QALY' measures. These are then compared with corresponding measures for some other interventions—significantly, ones which treat quite different medical conditions. This is the prototype of the Williams approach to priority-setting. Implicit in the analysis is the principle that interventions should be ranked by 'cost per QALY' and the NHS budget should be allocated to those with the lowest scores.

In fact, most forms of CABG turn out to be quite cost-effective at around £2000 per QALY. In comparison, kidney dialysis comes in at £11,000, while hip replacement is a much better buy at £750. Alan liked using the comparison between dialysis and hip replacement as an illustration of the logic of his approach. Dialysis was a high-technology treatment for a life-threatening condition. Hip replacement was undramatic and did not save lives, but an expansion of this programme could bring great benefits in reduced pain and increased mobility at low cost.

The next decade—a time of life at which many academics have retired—was in many ways the most productive period of Alan's life. The CABG study had shown the potential of the QALY approach, but the Kind/Rosser/Williams classification of health states was quite coarse, and the weights were not derived from a representative sample of the population. If QALYs were to be put to serious use, it was essential to refine the index. In addition, it would be advantageous to have a single index which could be used across as many applications as possible and across national boundaries. Alan was the central figure in two projects which addressed these issues.

The first project, which started in 1987 at a meeting in Rotterdam, was a loosely structured multi-disciplinary collaboration, initially involving researchers from seven centres in Britain, Finland, the Netherlands, Norway and Sweden. The aim was to produce a common system of generic classifications of health-related quality of life. This collaboration grew into a permanent research network, the 'EuroQoL Group'. The group was eventually able to agree on a generic classification system based on five dimensions of quality of life—mobility, ability to provide self-care, ability to perform usual activities, pain/discomfort, and anxiety/depression, each of which can be reported at three different levels. This descriptive measure, called 'EQ-5D', is now widely used around

the world, providing a simple language in which health states can be described.

The second project was a more structured research programme, funded by the Department of Health and directed by Alan, with Paul Kind as his right-hand man. The aim of this 'Measurement and Valuation of Health' programme was to generate weights for the health states defined by the EQ-5D classification scheme, based on responses from a large representative sample of the British population. The final product—a firmly grounded and operational QALY measure—was finally delivered in 1995.

The final piece in Alan's jigsaw was put into place in 1999, with the establishment of the National Institute for Clinical Excellence (immediately known more familiarly as 'NICE'), with Alan's long-standing colleague and ally, Tony Culyer, as its first vice-chair. NICE's main function was to develop clinical guidelines for the NHS. In particular, it was charged with the task of appraising new medical technologies in terms of their appropriateness for NHS use. This at last provided an institutional structure within which Alan's grand scheme for rational decision-making about health care could be put into practice. In its appraisals, NICE generally uses Alan's QALY measure to assess cost-effectiveness, typically approving new technologies which do not cost more than about £30,000 per QALY. In one of his last public lectures, delivered in 2004, Alan reflected on these developments, asking 'What could be nicer than NICE?'[17] Alan acknowledged that NICE was doing *almost* everything he could possibly ask, but urged it to extend its QALY-based appraisals from new technologies to clinical guidelines in general. Provocative to the last, he suggested that a shadow price of £30,000 per QALY was far too extravagant, and that a figure closer to per capita national income (currently £18,000 per year) might be more reasonable.

In the last decade of his life, Alan began to question whether, on egalitarian grounds, some people's QALYs should be given more weight than others. Previously, in his 'guide through the ideological jungle', he had espoused the principle of equal access to health care for those in equal medical need. But if (as he had always believed) the *raison d'être* of universal health care is to reduce health inequalities, and if health status is measured in QALYs, the natural implication is that we should seek to equalise QALYs across individuals. Having recognised this implication of his analysis, Alan—logical as ever—concluded that priority should be

[17] Alan Williams, *What could be nicer than NICE?* (London: Office of Health Economics, 2004).

given to improving the lifetime health of those people with the lowest lifetime QALY expectancy.[18] Since (as the Black Report had documented) life expectancy and health status in Britain are positively correlated with income and social class, many of the implications of this priority principle are in accord with egalitarian predilections. But, since men have markedly lower life expectancy than women, one implication is that (other things being equal) men's QALYs should have greater weight than women's. Professional egalitarians found this conclusion hard to take. Amartya Sen insisted that non-discrimination between the sexes should be treated as a moral constraint on health policy.[19] Alan's response can be paraphrased as: 'But *why*?' His counter-proposal was that policy should be based, not on axioms postulated by moral theorists, but on evidence about the trade-offs that members of the general public would want to see made on their behalf.[20]

Alan's interest in the distribution of QALYs had been sparked off by reflecting on what John Harris had called the 'fair innings' argument.[21] The idea, as re-expressed by Alan (at the age of 69) is that 'someone who dies young has been denied the opportunities that we older people have already had'; thus, as egalitarians, we should give more weight to the QALYs of the young than to those of the old. Or, more philosophically:

> In each of our lives there has to come a time when we accept the inevitability of death, and when we accept that a reasonable limit has to be set on the demands we can properly make on our fellow citizens in order to keep us going a bit longer.[22]

As the twenty-first century got under way, Alan may have recognised that he was becoming old; but he showed no sign of wanting to retire, or even to slow down. He was proud of the academic honours he received, such as the honorary doctorate announced by the University of Kuopio shortly before his death, and awarded posthumously; he was particularly pleased at being made a Fellow of the British Academy in 2002. But he was not the person to accept the status of a distinguished scholar reflecting on old glories. He wanted to be in the thick of things, and looked for

[18] Alan Williams, 'Intergenerational equity: an exploration of the "fair innings" argument', *Health Economics*, 6 (1997), 117–32.
[19] Amartya Sen, 'Why health equity?' *Health Economics*, 11 (2003), 659–66.
[20] Alan Williams, 'Comment on Amartya Sen's "Why health equity?"', *Health Economics*, 12 (2003), 65–6.
[21] John Harris, *The Value of Life: An Introduction to Medical Ethics* (London, 1985).
[22] Alan Williams, 'The rationing debate: rationing health care by age: the case for', *British Medical Journal*, 314 (1997), 820.

new controversies to provoke and new problems to tackle. In the last years of his life he was taking part in Home Office discussions about an analogue of the QALY for the criminal justice system—a potentially massive project in which he would surely have wanted to be fully involved.

Still, despite all this, he did find time for life away from economics. His private life centred on his family. From their first days together in Birmingham, Alan and June were keen walkers. After moving to York, they spent most Sundays walking in the Yorkshire Dales or on the North Yorkshire Moors. With the same propensity for organisation that he showed in his working life, Alan liked to plan his walks carefully in advance, and had a huge library of walking books to consult. He enjoyed pub lunches, and drew detailed maps showing the pubs he could recommend to himself. Symphony music and opera were other interests: he and June always had season tickets to the concerts at Leeds Town Hall, and were regulars at the Buxton and Ryedale Festivals. Alan was curious about how things worked. As a result of his work on cost–benefit analysis in the water industry, he developed an interest in sewage-treatment technology. Traction engines, preserved railways and model trains all appealed to him. He retained his political commitments to the end; with his daughter Susan, he took part in the 2003 demonstration in Hyde Park against the impending invasion of Iraq.

When he discovered that he had terminal cancer, he acknowledged that he had had a fair innings and accepted with stoicism his own downward path though the EQ-5D classification scheme. His taste for organisation did not desert him: he made careful plans for his own funeral and took part in the preliminary planning of the conference that was to commemorate his life and work. In a last message to his academic colleagues and friends, he reported on the excellence of the care he was receiving from the National Health Service. He died on 2 June 2005.

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Note. In writing this essay I have used information given to me by many people, but particularly June Williams, Susan Williams, Tony Culyer, Diane Dawson, Paul Kind, Alan Maynard and Alan Peacock.