

PASSWORDS TO POWER

A PUBLIC RATIONALE FOR EXPERT INFLUENCE ON CENTRAL
GOVERNMENT POLICY-MAKING: BRITISH SCIENTISTS AND
ECONOMISTS, c.1900 - c.1925.

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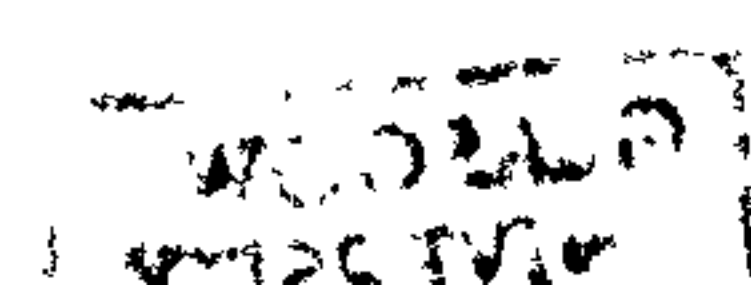
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ABSTRACT

The aim of the study is to explore and compare the rhetoric produced for public consumption by British scientists and economists in the period from c. 1900 to c. 1925, which was aimed at securing executive influence over government policy-making for these expert groups. I argue that members of each group followed characteristic strategies and produced distinctive rhetorics, but that they shared a common aim: the formalisation of influence over policy. I am testing the hypothesis, first put forward by Frank Turner in relation to natural scientists that a new type of public scientific rhetoric emerged from circa 1870 and was voiced by a sizeable minority of scientists in the Edwardian period. The key feature of this new rhetoric (which Turner dubs 'Public Science') was a call for scientists to be involved in government policy-making, on the basis of the transferability of scientific method to the areas covered by policy problems. I apply this model to scientists and to economists beyond the period initially considered by Turner. I argue that important sections of the economic and scientific communities actively pursued executive influence over policy in this period. I trace the course of the public arguments noting how they change over time in response to perceptions of the attitude of the State towards outside expertise and the changing context of national concerns. I examine the rhetoric in action in a case study of the Food (War) Committee of the Royal Society, which contained both scientists and economists. I argue that such a study of rhetoric is of great importance as a prerequisite for a correct understanding of the relations between experts and government in this period. Rhetoric must be recognised for what it is, a changing partisan account of the importance of science and scientific method.

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AUTHOR'S DECLARATION

I declare that this thesis is all my own work and that no portion of it has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

DEDICATION

In Memory of Stephen Smith and Alistair Spink.

LIST OF ABBREVIATIONS

Note: as a general rule all abbreviations used in this thesis are indicated in the text before being used, thus: British Science Guild (BSG). This list is provided for the convenience of the reader.

ACSIR	Advisory Council on Scientific and Industrial Research.
AOP	Official Papers of Sir William James Ashley, British Library, Manuscripts Department.
APB	Private Papers of Sir William James Ashley, University of Birmingham Library.
ASc.W	Association of Scientific Workers.
BAAS	British Association for the Advancement of Science.
BAC	British Association of Chemists
BEA	British Economic Association
BIR	Admiralty Board of Invention and Research.
BP	Papers of Sir William Beveridge, British Library of Political and Economic Science, London.
BSG	British Science Guild.
CCR	Committee of Civil Research
COE	Committee of Economists of the Board of Trade.
CW	Moggridge D., <i>et al</i> (ed.) <u>The Collected Writings of John Maynard Keynes</u> , (London, Macmillan, 1972-80). Chapter seven only.
DSIR	Department of Scientific and Industrial Research.
EAC	Economic Advisory Council.
EJ	<u>Economic Journal</u>
FIB	Food Investigation Board of the DSIR.
FWC	Food (War) Committee of the Royal Society.
IPCS	Institution of Professional Civil Servants.

MID	Munitions Inventions Department of the Ministry of Munitions.
MRC	Medical Research Committee (later Council).
NUSW	National Union of Scientific Workers.
PRO	Public Records Office, Kew.
PWC	Physiology (War) Committee of the Royal Society, also known as the Sectional Committee on Physiology.
RES	Royal Economic Society.
RIC	Royal Institute of Chemistry.
RS	Royal Society of London.
RSA	Royal Society of London Archives.
USRC	Unionist Social Reform Committee.

INTRODUCTION

But what I...thought altogether unaccountable, was the strong Disposition I observed in them towards News and Politics, perpetually enquiring into Public Affairs, giving their judgements in matters of State, and passionately disputing every inch of a Party Opinion. I have, indeed, observed the same Disposition among most of the Mathematicians I have known in Europe, though I could never discover the least Analogy between the two Sciences; unless those people suppose, that, because the smallest Circle hath as many Degrees as the largest, therefore the Regulations and Management of the World require no more Abilities, than the Handling and Turning of a Globe. But, I rather take this Quality to spring from a very common Infirmary of human Nature, inclining us to be more curious and conceited in Matters where we have least Concern, and for which we are least adapted either by Study or Nature.¹

Most accounts of the relations of British science and the State in the late nineteenth and early twentieth centuries tend to focus on how the State became the major patron of science. A number of factors are usually cited as contributing to this development: the encroachment of State activity into new areas 'combining statistical, intelligence and inspectorial expertise'²; the growing expense of scientific activity itself; and a sharpened perception of its importance to national security and economic prosperity. While none of this can, or should, be disputed, it has led to an approach which focuses on the attitude of the State to science. Even the title of the most recent comprehensive account (Peter Alter's The Reluctant Patron: Science and the State in Britain, 1850-1920³) embodies this perspective.⁴ Thus most accounts simply detail the setting up of the various State sponsored schemes for scientific research (for instance the Department of Scientific and Industrial Research - DSIR). Little attention has been given to the scientists' own political, social and professional agendas, or how they were expressed. The political aspirations of scientists have only been

¹ Jonathan Swift comments on the Laputan philosophers in Gulliver's Travels, p. 206, (Harmondsworth, Penguin, 1986 edition).

² Roy MacLeod, 'Science for Imperial Efficiency and Social Change: Reflections on the British Science Guild, 1905-1936', Public Understanding of Science, Vol. 3, (1994), pp. 155-193. See also Macleod (ed.), Government and Expertise: Specialists, Experts and Professionals, 1850-1919, (Cambridge, CUP, 1988), especially MacLeod's Introduction, pp. 1-24.

³ Peter Alter, The Reluctant Patron: Science and the State in Britain, 1850-1920, (Berg, Oxford, 1987).

⁴ See also for example, Donald Cardwell The Organisation of Science in England, (London, Heinemann, 1957); Steven and Hilary Rose, Science and Society, (Harmondsworth, Penguin, 1969)

considered in the limited sense of campaigns to secure better funding for science and economic and social status for scientists. This failure to interrogate scientific rhetoric fully has meant that the interaction of scientists with society has not been properly understood. The rhetoric which presented scientists as objective decision-makers, somehow above society and politics, has been uncritically incorporated at a fundamental level into historical accounts. Scientists have not been viewed as a professional expert group vying for political influence.

In this study I want to invert this perspective and to focus on the attitudes of 'science' (broadly defined as those disciplines which publicly adhered to a scientific method) to the State. I focus on the voicing of a public rationale for expert influence over central government policy-making by natural scientists c. 1900-1925, and I compare this with developments in the emerging British economics profession. I argue that each group produced a distinctive and historically specific rhetoric for public consumption geared to obtaining executive influence. This influence was seen as the crowning achievement of a process of professionalisation. Thus the initial nature of the rhetoric, and accompanying strategy for policy influence, depended on the degree, and form, of professional status each group perceived itself to have attained. The style of the rhetoric, and the preferred means to policy influence which it embodied, was then changed, over time, to capitalise on its own success in moving the profession closer to influence, as well as to bring it into line with the changing context of contemporary concerns. Faced with a British State culture which was reluctant to bring experts formally into the heart of the policy-making process (even when forced to go part of the way by the crisis of the First World War), both natural scientists and economists adjusted their public science accordingly. Scientists moved away from campaigning for formalised technocracy to supporting a new State organisation of science, with new bodies which could be informally linked to produce a power-base within the machinery of government. Economists, split over what form professionalisation should take because of an ongoing methodological dispute which led to continuing schism over the very nature and scope of the discipline, adopted two varying positions. One pursued only informal contacts, while the public image of economics was being rebuilt. The other pressed for

formalised mechanisms for integrating economists in policy-making in the short term. As with the natural scientists, it was the more politically astute approach which yielded the best results.

I will argue that in order for a clear understanding of the relations of the State and 'science' to be formed, an awareness of the nature of the demands on the State must be integrated into the history of 'science'/State relations. I want to suggest that such an analysis of rhetoric is also a useful indicator of the degree of professionalisation of a given group. I concentrate on scientists and economists because they are linked in their public and private use of the scientific method as the key to professionalisation and policy influence, and because they represent, respectively, one of the most, and one of the least professionalised groups.

The critical concept in this study is rhetoric, or what Frank Turner has dubbed 'public science'.⁵ Turner has described this as 'the body of rhetoric, argument and polemic' that scientists employ to 'justify their activities to the political powers and other social institutions upon whose good will, patronage, and co-operation they depend'.⁶ In a context of professionalisation, scientists' demands were carefully and deliberately framed in the language of key contemporary debates to urge the social value of scientific method. Turner suggests that the goals of public science were increased funding and professional status. He also begins to suggest a further dimension: that scientists were seeking some kind of political influence. A failure to decode this rhetoric may have led to inaccuracies and oversights. Thus Scientists naturally tended to talk down the state of British science when publicly appealing for more funding. Taking their rhetoric at face value has meant that most accounts underestimate developments in the scope and organisation of British science. But public science didn't only press for more science, it also pressed for more power for scientists, and in so doing it often painted a self-servingly dismal picture of the level of scientific input into policy-making. Here again, a too literal reading of rhetoric has found its way into most accounts.

⁵ F. M. Turner, 'Public Science in Britain, 1880-1919.', *Isis*, Vol. 71, (1980). pp. 589-608.

⁶ *Ibid.*, p. 589.

I will apply Turner's concept of public science as a tool to make the general point that expert groups which have publicly claimed to be above involvement in any form of politics to protect their scientific objectivity, have been written about as apolitical. I will argue that this failure has led to two further dangerous misconceptions. Firstly, that the integration of experts into the policy-making machinery of the British State was backward in this period, and secondly, that this meant that the British State did not receive sufficient expert advice in the framing of policy, in comparison with its international rivals. Neither of these is necessarily true, but my point is that historians cannot begin to seriously address these questions without an understanding of the rhetoric of public science. I will argue that not only did the formal mechanisms for the incorporation of expert advice into policy-making develop apace, especially during and immediately after the war years, but that networks of less visible informal contacts were at least as important as channels of influence; channels which may have hitherto gone unnoticed because of a historical agenda taken, uncritically, direct from the rhetoric of public science.

Some historians of natural science have drawn attention to the public efforts of the scientific community to obtain increased State funding for science, but the full implications of such activities have not been explored. Instead the rhetoric has been used directly as evidence for the reluctance of the State to properly fund scientific activity.⁷ Moreover, the implications of scientists' (and other expert groups') claims for executive influence over policy-making itself have been neglected. Only Frank Turner and Gary Werskey have argued that scientists were also attempting to obtain some kind of authoritative voice in policy-making at the same time.⁸ Turner originated the concept of public science in his pioneering

⁷ See for example, Alter, *op.cit.*, p. 75, 131 and 23.

⁸ Roy and Kay MacLeod have noted in their article 'The Social Relations of Science and Technology 1914-1939', pp. 301-63 in C.M. Cippolla (ed.) The Fontana Economic History of Europe The Twentieth Century Vol. 5 Pt. 1, (Glasgow, Collins/Fontana, 1976), that scientists became politicised during the 1920s. but they say nothing of the War, much less of the Edwardian period. Moreover they give no sense of the form the scientists' political aspirations took, nor of the arguments used in securing them. The same is true of much of MacLeod's other work: for example his 'Into the Twentieth Century', Nature, Vol. 224 (1969), pp. 457-461; 'Science and the Treasury: Personalities and Policies, 1870-85', in G.L'E. Turner (ed.), The Patronage of Science in the Nineteenth Century, (Leiden, Noordhoff International, 1976), pp. 115-172. In his most recent work, cited in footnote 2 above, MacLeod dismisses Turner's concept of public science altogether as too restricted a view of scientists activities. though he offers no alternative explanation for the kind of rhetoric being produced, which, in fact he largely ignores.

article in Isis in 1980.⁹ Turner argued for the recognition of the rhetoric of science for what it really was: a changing partisan account of the importance of science. It evolved (as did its political goals) in response to changing social and political ideologies, both within the scientific community and in society as a whole. Turner argues that 'Public Scientists':

...do not propagate scientific knowledge for its own sake, and their work may have little or nothing to do with the actual motivations or goals of scientific research. Rather they consciously attempt to persuade the public or influential sectors thereof that science both supports and nurtures broadly accepted social, political and religious goals and values, and that it is therefore worthy of receiving public attention, encouragement and financing. The pursuit of public science has involved lobbying various non-scientific elites, persuading the public or government that science can perform desired social and economic functions, defining as important those public issues that scientists can address through their particular knowledge or expertise, stressing professional standards among scientists, and defining the position of scientists vis-a-vis other rival intellectual or social elites.¹⁰

This definition enables Turner to discern three distinct periods of public science in the nineteenth and early twentieth centuries. The first, from approximately 1800-1851, saw public scientists such as Davy, Brewster and Babbage urging the importance of science as useful knowledge, 'an instrument of self-improvement, an aid to profitable, rational and usually individualistic economic activity, and a pillar of natural religion'.¹¹ During the second period, from the mid 1840s to the late 1870s, public scientists such as Huxley and Tyndall utilised the theory of biological evolution to stage a public battle with theology and metaphysics, partly in order to win a professional contest for social and cultural authority. Public science argued that whereas theology was all dogma, scientific methodology ensured free intellectual endeavour and objectivity. It was argued that rather than being subordinate to theology, science should have intellectual, and thus social, authority over it. Turner notes that in order to gain the advantage in this rhetorical battle, public science in this period emphasised the, 'values of peace, cosmopolitanism, self-improvement, material comfort, social mobility and intellectual progress'.¹²

⁹ Turner, op.cit.

¹⁰ Ibid., p. 590

¹¹ Ibid., p.591

¹² Ibid., p.592

Turner posits a third period beginning in about 1875, in which the themes of public science shifted dramatically 'towards the values of collectivism, nationalism, military preparedness, patriotism, political elitism and social imperialism'.¹³ Scientists had changed the political orientation of their rhetoric and its political objectives, partly because they themselves were influenced by the new dominant ideologies of the period, and partly to capitalise on this ideological shift in national values. The target of the rhetoric had thus now become political authority rather than the defeated enemy, theology. Hence, 'science came to be portrayed as a means to create and educate better citizens for State service and stable politics, and to ensure the military security and economic efficiency of the nation'.¹⁴ However, Turner seems to have a somewhat limited view of the political objectives of Edwardian public science. He certainly suggests that scientists were seeking, 'power or influence in the civic arena'¹⁵ but he does not clearly state what form the scientists envisaged this influence as taking.

I deepen this analysis by looking at what kind of influence over policy-making the scientists aimed at, and the mechanisms for achieving it. In so doing I expand Turner's concept of public science (which he largely took to mean public addresses, newspaper and journal articles) to include a range of public activities (including popular science texts, and the organisation of exhibitions). I also include the expression of the desire for increased policy-influence as it is privately voiced in letters between leading public scientists. In Chapter One I examine the scientific rhetoric of the Edwardian period, and, briefly, its provenance. In Chapter Two I take a detailed look at the War years, showing how a taste of the kind of power they wanted spurred the scientists to re-double their campaign, and the impact of widening access to influence on the rhetoric itself. In Chapter Three I examine the inter-war period, thus linking the work of Turner with that of Werskey¹⁶. Werskey has argued that the 1930s saw the bifurcation of the scientific community into 'Radicals' (those who wanted a restructuring of society along socialist lines, seeing this as the only way

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Ibid.

¹⁶ See Gary Werskey, 'British Scientists and "Outsider" Politics, 1931-1945', Science Studies, Vol. 1 (1971), pp. 67-83.

scientists could achieve power) and 'Reformists' (those who wanted to maintain and gain power through the social status quo). I argue that the 1920s was a transitional phase between Turner's final period of public science and Werskey's picture of the 1930s. Chapter Four is a case-study of public science in practice: I examine the campaign of the leading members of the Royal Society's Food (War) Committee to formalise the relations of the committee with the State and turn it into the official centre of scientifically framed food policy. This chapter shows how both scientists and economists worked together to press for formalisation, and thus forms a bridge to the section of the thesis (the last three chapters) which deals with the public science of economists.

A further part of my argument is that a radical public science was not restricted to natural scientists but was a common and characteristic part of the process of professionalisation of a variety of expert groups. I next examine the public science of economists. This group provides a useful comparison for a number of reasons. They were an increasingly academic-based expert group, but were not a cohesive profession at the opening of the study. In fact, Alfred Marshall deliberately sought to employ scientific metaphors for the business of economic investigation (likening it in turn to biology and physics), in an attempt to capture, by association, some of the authority of scientific method. Marshall wished to unify economics as a scientific discipline, so that economists might, in time, follow the rest of the professional path of science, which, as we saw, was geared to lead to increasingly formalised policy-making influence.

Much of the history of economic thought is still at the level of Whiggish internal accounts of the development of economic theory, with little or no social contextualisation. It is for this reason that Margaret Schabas has recently, and controversially, suggested that the field is ripe for the application of the methods and approach of the history of science.¹⁷ I want to contribute to this potentially very rewarding cross-fertilisation of the histories of economics and science: the process which Schabas recommends of making historians of science more:

¹⁷ M. Schabas, 'Breaking Away: History of Economics as History of Science' and the various 'Comments' making up the 'Minisymposium', History of Political Economy, Vol.24, No.1, Spring 1992, pp.185-247.

aware of the richness of the history of economics as a subject of enquiry...whether one goes in search of great minds, technical achievements, conceptual revolutions, ideological clashes, or political and religious controversies.¹⁸

A start has already been made in this direction in the work of A. W. Coats and John Maloney¹⁹. Maloney has covered Marshall's strategy for the professionalisation of economics in fine detail, but still he has not brought out that a crucial part of that strategy, one could even say a crucial reason for the employment of that strategy, was the eventual achievement of policy-influence for economists.²⁰ My fifth chapter re-examines Marshall's strategy for the professionalisation of economics in this light. In the sixth chapter I contrast Marshall's vision of the professional economist, with its plan for long-term formalisation of influence over policy with an alternative, competing, though ultimately unsuccessful version, that of the historical economist, William James Ashley. I then, in my seventh and final chapter, discuss how Keynes is perhaps less of a maverick when considered in the context of the public science of economics. I demonstrate that Keynes in fact builds on the professional legacy of Marshall in key ways.

Finally, a word on methodology and sources. My examination of the rhetoric of science focuses not only on key individuals, but also on organisations like the British Science Guild. By contrast, my examination of the rhetoric of economics is focused entirely on individuals. This seemingly inconsistent approach is in fact explained by part of my findings. Science and economics were at different stages of professionalisation. Economics was still in the process of acquiring representative professional/learned associations. These fledgling economic organisations were in no position to pronounce on controversial policy issues, because this would have undermined the image of an objective scientific profession that the very establishment of these bodies was meant to help to create. Similarly, for the same reason, one simply does not find the same kind of editorial coverage of sensitive policy

¹⁸ *Ibid.*, p. 198.

¹⁹ See the works by Coats and Maloney as detailed in the Bibliography at the end of this thesis.

²⁰ See particularly Maloney's Marshall, Orthodoxy and the Professionalisation of Economics, (Cambridge, CUP, 1985), *passim*.

issues, or even arguments for economists to frame policy, in the newly emerging economic learned journals (as one does increasingly in the scientific journals). In this respect my approach has been largely dictated by the materials available, though exactly why this has been the case will, hopefully, become clear in the main body of the thesis. My sources have therefore included contemporary journals, published writings and private as well as official papers. In using private papers I have attempted to get behind Turner's concept of public science to observe the private debates between individual scientists about the form and degree of influence they should publicly seek. This approach, I hope, allows me to get closer to the true political ambitions of both natural scientists and economists.

CHAPTER ONE

THE SCIENCE OF POLITICS: EDWARDIAN PUBLIC SCIENCE AND THE BRITISH SCIENCE GUILD.

His [Norman Lockyer's] view was that expressed in that well-known dictum of Swift: 'That whoever could make two ears of corn or two blades of grass grow upon a spot of ground where only one grew before would deserve better of mankind and do more essential service to his country than the whole race of politicians put together'.¹

The increasing size of the British State, and the increasing complexity of the roles it was taking on in British society in the period from c.1880², coincided with an increase in the scope of the ambitions of professional and professionalising groups to include influence over central government policy-making. The existence of such marginalised groups had been noted in 1902 by H.G. Wells who identified an 'emergent class of capable men'³ who were isolated from traditional political networks and consequently had no way of making their voice heard in policy-making. These groups were increasingly middle class and university trained. It was just these kind of frustrations with existing social and political arrangements which the Webbs were attempting to harness (and which they themselves felt), with their efforts to train up a new cadre of professional experts for government service at the London School of Economics.⁴ Those, like the scientists, who had already reached a certain professional status, (and with it a certain level of social and cultural authority) took advantage of the State's increased need to consult knowledgeable outsiders in unfamiliar areas of policy to press for a formalisation of their influence over policy-making. Scientists, like others, were attempting to redefine the concept of expertise to mean a body of knowledge, and a method, with a

¹ T. Mary Lockyer and Winifred Lockyer, The Life and Work of Sir Norman Lockyer, (London, Macmillan, 1928), pp. 185-6.

² On this see, for example, Roy MacLeod, (ed.), Government and Expertise..., *op.cit.*, particularly MacLeod's introduction.

³ Wells, Anticipations of the Reaction of Mechanical and Scientific Progress upon Human Life and Thought, (London, Harper, 1902), p. 179. Cited here from Turner, 'Public Science...', *op.cit.*, pp. 603-4.

⁴ See Beatrice Webb, Our Partnership, (London, 1948), *passim*. See also W.H. Greenleaf, The British Political Tradition. Volume II: The Ideological Heritage, (London, Routledge, 1983). *passim*.

recognised application to all areas of policy-making. This process involved the creation and utilisation of a new, radical public science.

This chapter explores the objectives of the rhetoric of Edwardian scientists, particularly as expressed through the British Science Guild (BSG), a London based scientific pressure group set up by the astronomer Norman Lockyer, in 1905. I will argue that the rhetoric not only echoed the traditional grievance of scientists that British science was deficient, but that it also served a radical new political goal: the achievement of meaningful influence over government policy-making. To this end it utilised a characteristic reworking of Edwardian fears about declining British power, and a redefinition of national problems as essentially scientific, to represent politics as a scientific activity best undertaken by scientific experts. In seeking to demonstrate this, I will focus on the rhetoric, activities and make-up of the BSG, which, I will argue, was the major mouthpiece for the new political rhetoric of science in Edwardian Britain.

The BSG has, when it has been considered at all, been given only a passing reference in most accounts of the relations of science and the State in Edwardian Britain. Most commentators have dismissed the BSG as an extension of the British Association for the Advancement of Science (BAAS), and have thus understood its political objectives in the limited terms laid down by the Association's founders: 'to obtain a more general attention to the objects of science and a removal of any disadvantages of a public kind which impede its progress'.⁵ This is a very curious misreading indeed. Lockyer made it clear that it was his frustration with the BAAS's over cautious interpretation, even of these moderate political goals, which spurred him into forming the BSG to be a body which would lock horns with the State. Thus while both G.R. Searle and Roy MacLeod have noted that the Guild formed from Lockyer's Nature circle and that in its rhetoric it utilised the contemporary common context

⁵ One of the original aims of the BAAS as cited by Sir Norman Lockyer in his Presidential Address to the BAAS in 1903, pp. 439-40, 'The Influence of Brainpower on History', in Nature, Vol. 68. (1903), pp. 439-447.

of national efficiency fears to gain support for its political goals, they have failed to identify correctly the full extent of these goals.⁶ It is assumed that the Guild had the very limited political aims of, as Searle put it: 'to attract more public money to universities and other institutions where the bounds of science were being extended'.⁷ In fact the Guild was also concerned with extending the bounds of science to include government policy-making.

This failure is repeated by Peter Alter in his The Reluctant Patron.⁸ Alter provides a synthesis of the existing scholarship on the Guild, but offers few fresh insights. He sees the Guild as using the language of National Efficiency to equate the needs of science with those of the nation, engaging in 'effective publicity work' and making 'hefty demands for more expenditure on universities and research'.⁹ Alter brackets the Guild with the BAAS as a pressure group pursuing purely professional goals, without understanding that these also included political ones.

The case of Roy MacLeod is rather different. He has always understood that scientists produced rhetoric to advance their interests with the public and politicians. He has also indicated that these interests have included not only more funding, pay and better prospects, but also 'the application of scientific method to politics'.¹⁰ However, in his recent detailed analysis of the Guild, he rejects Turner's view of the Guild as a body dedicated ostensibly to furthering public science campaigns, arguing that the Guild should not be seen 'as a voice with a single message'.¹¹ He posits that Turner's analysis of the Guild 'as a pressure group

⁶ See G.R. Searle, The Quest for National Efficiency. A Study in British Politics and Political Thought, 1899-1914, (Oxford, Basil Blackwell, 1971), especially pp. 83-4. See also Roy MacLeod, 'Into the Twentieth Century', op.cit., and 'Introduction: On the Advancement of Science', in MacLeod and P. Collins (ed.), The Parliament of Science: the British Association for the Advancement of Science, 1831-1981, (Northwood, Science Reviews Ltd., 1981), pp.17-42, especially pp. 34-5.

⁷ Searle, op.cit., p.84.

⁸ Alter, op.cit.

⁹ Ibid. p. 92 and p. 93

¹⁰ MacLeod, p. 35, 'Introduction: On the Advancement of Science', in MacLeod and P. Collins, op.cit., pp. 17-42. See also these other works by MacLeod: 'Into the Twentieth Century', op.cit.; 'Science and the Treasury: Personalities and Policies, 1870-85', op.cit.; and Roy and E.K. MacLeod, 'The Social Relations of Science and Technology 1914-1939', op.cit.

¹¹ MacLeod, 'Science for Imperial Efficiency...', op.cit., p. 156.

that used the rhetoric of expertise and patriotism to serve the interests of “public scientists”, national efficiency, and administrative reform’, is an oversimplification.¹² He argues instead that the aims of the Guild changed over time and that its history ‘reveals three phases of ideological reorientation’:

While its first decade saw appeals to the rhetoric of progressivist, imperialist, Victorian goals of scientific management, its wartime and immediate postwar history reveals initially successful efforts to ‘bureaucratize’ science in the administrative machinery of advice. A third phase emerged between 1925 and 1935 when, threatened by a loss of momentum, it began to lean towards the ‘social responsibility’ of science, and formed the right wing of a temporary coalition - a ‘popular front’, in Gary Werskey’s phrase - with Britain’s radical science movement, whose vision was captured in J.D. Bernal’s The Social Function of Science.¹³

However, in the rest of this paper, MacLeod offers nothing in place of Turner’s analysis, no framework within which to understand the Guild’s activities. MacLeod does not specify what the scientists wanted; what the ‘interests of “public scientists”’ were. Nor does he explain how the rhetoric operated to achieve these aims. There is no examination of how the rhetoric of science (how the Guild expressed its ‘message’) changed with these changing conditions. We thus have little idea of what it was that the scientists wanted, and, I would argue, this makes it very difficult to assess what they eventually won from the government. In the next four chapters I intend to explore in detail the changing nature of the rhetoric. I will argue that though the political aims of science did change in response to changing conditions these were changes in degree, not in kind. Public Scientists continued to argue for influence over policy, though the nature of these arguments changed with the gradually increasing amount of influence they enjoyed. All of the periods in the BSG’s history discerned by MacLeod can best be understood in terms of a public science which, though it still pursued funding, pay and prospects, was first and foremost chasing policy influence.

¹² Ibid.

¹³ Ibid.

It is only Frank Turner who has suggested that the Guild was conducting a concerted campaign to achieve more radical political objectives.¹⁴ Turner, keenly aware of the specificity of Edwardian public science, emphasised the fact that Edwardian scientists, and especially those represented by the Guild, were using the context of national efficiency to try to gain the kind of meaningful political influence that such middle-class professional groups had been denied. As Turner argued:

The Devonshire Commission had suggested a council on science as wise public policy; the British Science Guild sought to make government by distinguished experts a matter of patriotism. By 1912 the Guild...was clearly a conservative, social imperialist pressure group seeking to combine the intellectual prestige of science with the political attraction of efficiency and Empire.¹⁵

However, though Turner made it clear that scientists were set on obtaining policy influence, he says nothing about the kind of influence this was to be. Was this, for instance, to be a general and executive power over all aspects of policy, or only those aspects directly related to science? Turner also neglected to specify the institutional form the scientists envisaged this new policy influence taking. On both these questions, Turner suggests only that the scientists were seeking 'power or influence in the civic arena'.¹⁶

In this chapter I will want to re-evaluate the BSG in the light of Turner's analysis, but I will also want to go further and to argue that the Guild was seeking to redefine politics as a scientific activity and thus that its ultimate objective was technocracy: the replacement of traditional forms of government with an unelected executive council of scientists. I will also argue that, as well as advocating government by a scientific council, the Guild operated as a working model outside the machinery of government of the kind of scientific council it wished to see supervising this entire machinery from above.

¹⁴ F.M. Turner, *op.cit.*, especially pp. 601-3.

¹⁵ *Ibid.*, p.602.

¹⁶ *Ibid.*,

1.1 THE EMERGENCE OF THE NEW RHETORIC

The radical political objective of executive power over policy-making had been a feature of public science as early as the 1850s, with the arguments of Lord Wrottesley.¹⁷ He was active throughout the 1850s, notably as chairman of the Parliamentary Committee of the BAAS, in campaigning for the establishment of a Board of Science to advise the government. In 1857, during his Presidency of the Royal Society, he persuaded the Council to adopt twelve resolutions for the advancement of science which were forwarded to the Prime Minister, Palmerston. The tenth resolution stated that,

...it appears to the President and council that much benefit would arise from the formal recognition of some Board which might advise the Government on all matters connected with science, and especially on the Prosecution, Reduction and Publication of Scientific Researches, and the Amount of parliamentary or other Grants in aid thereof; also on the general principles to be adopted in reference to Public Scientific Appointments; and on the Measures necessary for the more general Diffusion of a Knowledge of Physical science among the Nation at large...¹⁸

This kind of argument was again raised by the eighth report of the Devonshire Commission nearly twenty years later, in June 1875. However, by now the call was for a separate Ministry of Science with a Board of Scientific Advisers attached. This radicalisation of the political aims of the progressive wing of the scientific community reached its high point in the nineteenth century with the founding of the new weekly journal of science, Nature, in 1869 by Norman Lockyer, who had been the Secretary to the Devonshire Commission. However the rhetoric which appeared in the editorial columns of Nature had an even more radical edge. The Nature circle, disillusioned by governments continually turning a deaf ear to the grievances of science, had decided to challenge the competence of traditional forms of

¹⁷ Lord John Wrottesley, astronomer, President of the Royal Society from 1854-8, and President of the BAAS at the infamous Oxford meeting of 1860. For more details see David Layton, 'Lord Wrottesley, F.R.S., Pioneer Statesman of Science', Notes and Records of the Royal Society of London, Vol. 23, (1968), pp.230-46.

¹⁸ From letter of Wrottesley as President of the Royal Society to Viscount Palmerston with resolutions of the Council enclosed, Order of the House of Lords, 18 June 1857, cited from Layton, op.cit., pp. 241-2.

democratic government. The new rhetoric argued that only the application of the scientific method to politics could ensure the same degree of accuracy that was (supposedly) to be found in the natural sciences. As the editorials of Lockyer and his contributors made clear, Statesmanship had to become scientific:

The same laws that influence the development of the individual influence the real progress of the nation, and it is only by honest investigation on strictly scientific principles that these laws can be discovered...Scientific method is peculiar to no section of phenomena... and we venture to think that in no department could it be applied with greater success than in that department which hitherto has been almost entirely under the sway of prejudice and blind party spirit...if scientific statesmanship....were the guiding principle in the conduct of public affairs, this nation would be more fitted than ever to survive and play the leading part in the affairs of the world.¹⁹

It proved to be a very short distance from arguing for more scientific method in government to arguing for government by scientists. Although Wrottesley and the Devonshire Commission had mooted radical political aims for science, they had envisaged only an advisory role for a scientific council in government; Lockyer was to take the political objectives of science a stage further and argue for a national scientific advisory council with executive power. Moreover, whereas such radical political objectives had in the past been restricted to the fringes of the scientific community, they were now moving into the mainstream. Lockyer wanted to turn the traditional relationship between science and the state on its head and have the scientist as 'the organist' and the politician as 'organ-blower'.²⁰

1.2. THE GUILD: FOUNDATION, AIMS AND METHODS

By 1903, Lockyer had realised that a new initiative was needed to carry forward the new political objectives. He decided that the time was ripe for a new organisation specifically dedicated to pressing the case for more influence for scientific methods and scientists in the

¹⁹ Lockyer, 'The Science of Statesmanship', editorial of 29 January 1880 in Nature, Vol. 21, (1879-80), pp. 295-6.

²⁰ Ibid.

conduct of national affairs. In this year Lockyer was President of the BAAS, and he took advantage of this platform to outline his plans for the new body in his Presidential Address in September at Southport. He had, he stated,

...been driven to the conclusion that our great crying need is to bring about an organisation of men of science and all interested in science, similar to those which prove so effective in other branches of human activity. For the last few years I have dreamt of a Chamber, Guild or League, call it what you will, with a wide and large membership...²¹

Lockyer believed that such an organisation would force governments to take notice of science by creating an organised 'body which formulates her demands', and thus providing, 'a collective voice on the larger national questions'.²² Lockyer expressed the hope in this address that the BAAS might itself take on this more overtly political role, but he made it quite clear that if it should refuse he would form a new and more politically radical organisation. He warned: 'Rest assured that sooner or later such a guild will be formed because it is needed. It is for you to say whether it shall be, or form part of, the British Association.'²³ When Lockyer discovered that, as he had suspected, the BAAS was prepared to campaign for science's more moderate political goals of more public money for science,²⁴ but was not willing to become the pressure group for (and working model of) a national scientific council with executive powers, he set about founding a new organisation, the BSG.

When Lockyer formed the Guild between 1903-5, he took with him from Nature many of its leading contributors. These included Sir Lauder Brunton the physiologist and editor of the medical journal, The Practitioner; the electrical engineer and Professor of Mechanics and Mathematics at the Royal college of Science, John Perry; the chemists Sir William Ramsay and Raphael Meldola (the latter had been Lockyer's assistant at South

²¹ Lockyer, 'The Influence of Brainpower on History', op.cit., p.441.

²² Ibid.

²³ Ibid.

²⁴ For instance, in 1904 Lockyer himself headed a BAAS deputation which waited on the then Prime Minister, Balfour, and Chancellor of the Exchequer, Austen Chamberlain, to urge the increased state endowment of universities.

Kensington). The Guild was thus to reflect the political objectives which, as we noted earlier, Nature had espoused since the 1880s. The Guild would of course continue to campaign for the more traditional and moderate political aim of scientists (public money), but it would do this by stressing the necessity of scientific method in all areas of national life. Lockyer stated in his announcement of the Guild's inaugural meeting in Nature, in early 1905, that while,

The Royal Society and British Association were founded for the promotion and encouragement of natural knowledge...the science Guild...is not identical in aim with any existing society. The promotion of natural knowledge is outside its sphere. Its purpose is to stimulate not so much the acquisition of scientific knowledge, as the appreciation of its value and the advantage of employing the methods of scientific inquiry, the study of cause and effect, in affairs of every kind. Such methods are not less applicable to the problems which confront the statesman, the official, the merchant, the manufacturer, the soldier, the schoolmaster, than to those of the chemist or biologist...²⁵ [my emphasis]

In so saying, Lockyer was setting out one of the crucial elements of the Guild's political rhetoric. Scientific expertise was applicable to every kind of problem, not just scientific problems, and, by implication, politicians, who made policy for all areas of national life, should use the scientific method. It was essential to establish this before the argument could proceed to its logical conclusion: that scientists should have political authority over all areas of policy-making.

The Guild argued that the ideal institutional mechanism through which this authority should be expressed was the national scientific council. This form was first suggested by Lockyer himself in his Presidential Address to the BAAS in 1903. He reminded his audience that the Devonshire Commission had recommended such a council and noted with admiration that Germany already possessed one:

It consists of representatives of the Ministry, the Universities, the industries and agriculture. It is small, consisting of about a dozen members, consultative, and it reports direct to the Emperor. It does for

²⁵ 'The British Science Guild', p. 586, Nature, Vol. 72, (1905), pp.585-6.

industrial war what military and so-called defence councils do for national armaments; it considers everything relating to the use of brainpower in peace, from the alterations in school regulations and the organisation of Universities, to railway rates and fiscal schemes, including the adjustment of duties. I am informed that what this council advises generally becomes law. [my emphasis]

Lockyer envisaged a council which appeared advisory in nature but possessed, if not official then at least unwritten, executive powers. Its introduction into Britain, which unlike Germany was at least notionally democratic, would have meant the complete undermining of the power of elected ministers, or perhaps even a radical revision of the British governmental apparatus into, what would effectively have been, a technocracy. Needless to say, Lockyer viewed it as a matter of national importance that such a council be set up in Britain. He asked 'Without such a machinery as this, how can our Ministers and our Rulers be kept completely informed on a thousand things of vital importance?' ²⁶

This vision of the aims of the Guild was not Lockyer's alone but was shared by other leading members of the Guild. For example, the first President, the Liberal Imperialist M.P., and fervent supporter of science (although only as and when it suited him), Richard Burdon Haldane. He had repeatedly spoken out for a corps scientifique to be part of government before his official attachment to the Guild had begun, and he reiterated this belief in his Presidential address to the inaugural meeting of the Guild on October 30th 1905. Nature reported his speech:

For himself he believed that things would not be right until we had a permanent scientific corps under a permanent committee, just as the Defence Committee was under the Prime Minister today. He meant a body that would not consist merely of officials of the ordinary kind, but should consist of the most eminent men of science, who would go there because they were honoured and put on the footing upon which they deserved to be placed, and were recognised as a body of men who would

²⁶ Both quotations above from Lockyer, 'Brainpower...', op.cit., p.446.

be at the elbow of the department, and could organise the scientific work of the state...²⁷

Such sentiments were not restricted to Lockyer and Haldane but were expressed by many leading members of the BSG. Nature reported Sir William Ramsay, for instance, as saying at the same inaugural meeting that:

...in England we had a great deal of scientific ability...its application to the affairs of the State, to the Army, to the Navy, to the service of the nation at large, could be very much better organised than it was. The object of the Guild was to attempt to effect that organisation, which was so much required.²⁸

The BSG had a tripartite strategy by which it hoped to realise its political objectives. The first element in this strategy was the rhetoric: the presentation, or packaging, of the arguments for political power for scientists as answers to perceived contemporary national problems. The second was the form that Lockyer finally decided the Guild should take: a small but very well-connected pressure group, rather than the large organisation with wide membership which he had first imagined. Finally, I want to argue that the very way in which the Guild worked was an element in its game-plan. It behaved as a model of the Scientific Council its rhetoric advocated. I shall briefly want to consider each of these elements in turn.

In arguing for its political objectives, the rhetoric of the Guild was informed by, and utilised, the prevailing context of concern in Edwardian Britain for national efficiency. This common ideological context is best described as a sense of national insecurity, which resulted in a public debate (expressed in political speeches, books, pamphlets and newspaper and journal articles) about the most effective methods of ensuring military and industrial supremacy in a changing domestic and international situation. This debate even extended to questions about the efficacy of the contemporary political elite and the traditional British form

²⁷ Haldane, Presidential Address to the BSG, as reported on p. 12, Nature, Vol. 73, 'The British Science Guild', pp. 11-13.

²⁸ Sir William Ramsay moving the vote of thanks to the Lord Mayor of London, Ibid., p.13. (the inaugural meeting of the Guild had been held at the Mansion House).

of parliamentary government.²⁹ It was, therefore, a climate in which the new political rhetoric of the Guild was assured a sympathetic hearing, especially as the members were careful to present their arguments in the language of contemporary concerns. Six key motifs can be identified in the rhetoric which were all issues of great contemporary importance: the view of international relations as an evolutionary struggle, a kind of external social Darwinism; the economic, military, scientific and political backwardness of Britain; the argument that these problems were caused by a lack of science and scientific thinking in government; an attack on party politicians, their methods of government portrayed as the root of national problems; a new definition of politics as a science and the inference that thus scientists should have political power; and finally the advocacy of a policy of educational reform to ensure a ready supply of scientific experts for the political future. This, at least, was the argument as made by the scientists in its long-hand form, though all of these stages were not always present simultaneously. For instance, in 1903, Lockyer argued for the application of scientific thinking to government by invoking the spectre of the Boer War:

If anyone is under the impression that Britain is only suffering at present from the want of the scientific spirit among our industrial classes and that those employed in the State service possess adequate brainpower and the grip of the conditions of the modern world into which science so largely enters, let him read the report of the Royal commission on the war in South Africa.³⁰

The report, as might be expected, was hardly glowing with praise for the conduct of the war. Lockyer argued that 'Brainpower' was the key to national salvation. It was the ultimate political panacea and offered efficient government at home and a strong industry and armed forces to maintain Britain's status abroad. It was also a cipher for political power for scientists. As he commented at another point in his Southport address of 1903:

The more our rulers and legislators, administrators and executive officers possess the scientific spirit, the more the rule of thumb is replaced in the State service by scientific methods, the more able shall we be, thus armed

²⁹ For details see Searle, *op. cit.*

³⁰ Lockyer, 'Brainpower...', *op. cit.*, p.440.

at all points, to compete successfully with other countries along all lines of national as well as of commercial activity.³¹

The message could not have been made clearer or more appealing; Government by scientists was for the benefit of the nation.

On other occasions members of the Guild took up related themes. For instance, the Scottish astronomer Sir David Gill³² took the opportunity of the Guild's Annual Banquet in 1913 to lambast the subjective, partisan nature of party politics and to exalt the scientist's approach to knowledge as infinitely more sensible:

The instincts of the man of exact science are indeed opposed to those of the normal party politician. The man of science must be very sure of his grounds before he makes a statement, and must rigidly compare all existing facts with any theory before he declares the probability, or his personal conviction of its truth. Above all he must be careful to avoid the influence of preconceived ideas...Where should the party politician be if he based his action on such grounds? He would soon be hounded out of his party, or reduced to slavish submission by the party whip.³³

The bacteriologist Ronald Ross,³⁴ who was also a member of the Guild, expressed similar anti-democratic sentiments in his more robust style. He became editor of the journal Science Progress in 1913. He turned what had hitherto been a journal for the popularisation of recent scientific discoveries to an interdisciplinary and lay audience³⁵ into a public forum for the discussion of controversial issues. He introduced editorial coverage in which he repeatedly

³¹ Ibid.

³² Sir David Gill, KCB, FRS, astronomer, (1843-1914). Gill was educated at the University of Aberdeen, and was H.M. Astronomer at the Cape of Good Hope, 1879-1907.

³³ Sir David Gill, speech to the BSG Annual Banquet, 26th May 1913, as reported in Nature, Vol. 91, (1913), p.358.

³⁴ Ronald Ross, KCB, FRS, (1857-1932). Awarded Nobel Prize for Medicine in 1902 for his work in Africa on malaria. He was in charge of malaria problems during the War. KCB 1911, KCMG 1918.

³⁵ See Science Progress in the 20th Century: a Quarterly Journal of Scientific Thought, No. 1, July 1906, Editorial Preface by N.H. Alcock, M.D. and W.G. Freeman B.Sc. F.L.S., pp. 1-3. The journal had first appeared in 1894 under the auspices of Sir Henry Burdett. Seven volumes appeared edited by Professor J. Bretland Farmer, but the original publication had folded in 1898.

criticised party government and advocated technocracy. For instance, in 1915 Ross was expressing the radical hope that:

...the war will be followed by a revolution in England...principally directed against the sort of people who now rule us and whose frequent neglect of the advice of experts...has been largely responsible for the war.³⁶

For Ross, the politicians' every 'utterance ...is worthless on any question which is touched by his politics'.³⁷ Such men were 'not intellectually or morally ...fit to rule a great Empire'.³⁸

Not only had the political aims of scientists become more radical by the Edwardian period, but these objectives were being sought with a rhetorical language which was specifically Edwardian in its ideological content: the sub-text of fears about national efficiency.

As well as having a persuasive rhetoric, the Guild even advanced its own political aims by the way it operated. Partly of course it operated as a straightforward and very typical Edwardian pressure group like the National Service League or the Navy League. This involved circulating letters, intervening in disputes, making depositions, establishing committees of enquiry, publishing its views in reports, holding annual meetings and socialising at banquets or dinners. However, I want to argue that there was another way in which the Guild worked: it operated as the kind of national advisory council that its rhetoric was advocating, and thus demonstrated how such a council could work for the national good. It did this by offering advice to the government of the day, by shadowing official consideration of issues and producing what amounted to minority reports on key topical issues. Later, when its views on the necessity of scientific advice came to be officially recognised, it was asked directly by government departments to render advice on scientific matters.

³⁶ Sir Ronald Ross, p. 151, 'A Hoped for Revolution in Britain', editorial in Science Progress, Vol. 10, (1915-16), pp. 151-3.

³⁷ Ross, editorial in Science Progress, Vol. 9, (1914-15), p.391, entitled, ' Militarism and Party Politics'.

³⁸ Ross, p. 665, editorial in Science Progress, Vol.10, (1915-16) entitled, 'Party Impolitics II', pp. 664-5.

Lockyer's original inspiration for the Guild was drawn from the German Navy League in two ways. Firstly, he initially visualised a large and broad membership. Secondly, he saw the Guild's aims as similar: both ^{organisations} were working to increase national power. As Lockyer said in September 1903:

We in this Empire certainly need to organise science as much as in Germany they find the need to organise a navy. The German Navy League...has a membership of 630,000, and its income is nearly 20,000 l.[pounds] a year. A British Science League of 500,000 with a sixpenny subscription would give us 12,000 l.[pounds] a year, quite enough to begin with...³⁹

However, even by December 1903, Lockyer had changed his mind as to the kind of Guild he wanted. After consultation with Lord Avebury (Sir John Lubbock) it was agreed that the minimum rate of subscription should rise to 2/6.⁴⁰ A further 'entrance fee' was added to this making a year's subscription at ordinary membership level cost five shillings in all. Lockyer had decided that a small organisation recruited from among the nation's most eminent men would have greater influence with the political authorities. Announcing the formal formation of the Guild in Nature in August 1904, Lockyer stated that:

...it is expected...that its members will be recruited principally from the following: The House of Lords; The House of Commons; Colonial Legislatures; County, District, Borough and Parish Councils; Municipalities; Educational Committees; Scientific and Literary Organisations; Commercial and Industrial Chambers and Organisations; the Learned Professions, Universities, Colleges, Educational Bodies and Representatives of Labour.⁴¹

Armed with this new vision, Lockyer approached leading politicians and notables. he contacted Balfour, Rosebery and Joseph Chamberlain as eminent politicians with a known interest in science. Only Chamberlain agreed to be a Vice President of the Guild, though even

³⁹ Lockyer, 'Brainpower..', op.cit., p.441.

⁴⁰ Lockyer was trying to persuade Avebury to join the Guild, which he finally did as Honorary Treasurer. In a letter to Lockyer on 2nd December 1903 (from the Norman Lockyer Papers, Exeter University Library, box labelled 'Letters received A-B') Avebury asked 'Again is 2/6 enough as a subscription ? Surely it could not cover expenses!'

⁴¹ From Lockyer's announcement of the formation of the BSG, p. 343, Nature, vol. 70, (1904), pp. 343-4.

this was a purely nominal position which merely ensured the presence of an influential name.⁴² However the members of the Guild did include a large number of nobles,⁴³ many M.P.s with an interest in science,⁴⁴ a brace of military men,⁴⁵ and nearly all the leading representatives of contemporary science.⁴⁶ But perhaps Lockyer's greatest coup was to secure the services of the leading Liberal Imperialist MP, R.B. Haldane, as first President (1905-13). His presence gave the Guild a figurehead who commanded public attention.

By early 1906, the Guild seemed in a strong position to press home its public science arguments. Its President had been made Secretary of State for War (and was later made Lord Chancellor, in 1912) and a reforming Liberal Government was in power, whose social agenda was very close to that of the Guild. But the Guild didn't only rely on its President's connections to extend the influence of scientists. It also operated as a model of the kind of executive scientific council it wanted to see as a formal part of the machinery of government.

Sir David Gill, speaking in 1913, described the Guild's way of working: not only did it respond to government requests for advice as the Royal society did, but in most cases it let government know when scientific advice was needed,

...when a Bill is in course of preparation...in which it is clear that scientific advice has been neglected or not demanded, the science Guild refers the matter to a competent committee of its own, and tenders advice without

⁴² There is no record of Chamberlain ever having attended any of the Guild's functions.

⁴³ Among them Lord Balcarres, Earl Egerton of Tatton, Lord Reay, The Lord Strathcona and Mount Royal, Lord Tennyson and the Lord Bishop of Ripon.

⁴⁴ Among them Sir Gilbert Parker, Sir Michael Foster, Mr. E. Roertson, Sir John Colomb, Mr. F. Verney, Mr. W. Phipson Beale, Sir John Gorst, Sir Charles McClaren, Thomas Burt and Charles Bathurst.

⁴⁵ Among them Captain E. W. Creak, Major-General Sir Owen Tudor Burne, Admiral Sir Cyprian Bridge, Major-general Sir J.F. Maurice, Colonel Sir John Young and Major O'Meara.

⁴⁶ Including R. Meldola, Sir William Ramsay, S.P. Thompson, Sir J. Burdon-Sanderson, Sir Archibald Geikie, Sir Joseph Hooker, E.R. Lankester, J. Lamor, Lord Lister, H. Roscoe, Lubbock (Avebury), Lord Rayleigh, Sir P. Magnus, Sir W. Abney, Sir W. Mather, Sir G. Darwin, Sir William White, Sir David Gill, Sir R. Ross, Richard Gregory, and John Perry. Medical men and industrial scientists were also well represented: for instance, Sir Alfred Keogh, Surgeon-General and later the Director of the Army Medical Service, and the physiologist and pharmacologist, Sir Lauder Brunton, the industrial chemist Sir G. T. Beilby, and the onetime President of the Institute of Electrical Engineers, Dr. Ferranti.

solicitation...as time goes on Governments will more and more find the importance of listening to..advice so tendered.⁴⁷

The Guild shadowed official consideration of key issues of national concern or produced critical reports of current or proposed legislation. The Guild's reports were widely circulated to politicians, and all parties with an interest in the topic under consideration. For instance, in 1911 the Medical Committee considered the prevention of tuberculosis. A memorandum was sent to the Treasury Departmental Committee, which was also considering this subject. When the Treasury Committee produced its interim report in 1911, the Guild found that it concurred with the recommendations of the Medical Committee. Furthermore, during 1912, the government confirmed that the research recommended by both Treasury and BSG would go ahead, and voted £57,000 for its execution out of the funds generated by the recent National Insurance Act.⁴⁸

In 1912, the Joint Committee of the Educational and Technical Education Committees called a special sitting 'Owing to the declaration by the Government of the intention to bring in a comprehensive scheme to reorganise the educational system of the country...'⁴⁹ The Committee hastily set about compiling a list of proposals for inclusion in the forthcoming legislation.

In time government even came to consult the Guild on specific questions, thus officially recognising the usefulness of such a body. The best example of this came in late 1914. The Board of Trade had set up a committee to enquire into the manufacture of optical glass in Britain. This committee in turn set up a Technical Sub-Committee chaired by Lord Moulton. Moulton then asked the BSG to aid him in the collection of data on the supply of optical glass. To this end, the Guild's existing Technical Optics Committee was strengthened

⁴⁷ Sir David Gill, *op. cit.*, p.359.

⁴⁸ See the British Science Guild: Sixth Annual Report, (1912), p. 10 (A complete set of bound copies of the Reports of the Guild until its amalgamation with the BAAS in 1935, are held at the British Library, London.)

⁴⁹ British Science Guild: Seventh Annual Report, (1913), p. 6.

by the co-option of new expert members: F.J. Cheshire of the Patent Office, Dr. R.T. Glazebrook, Director of the National Physical Laboratory, and H.J. Stobart from leading optical glass manufacturers, Chance Brothers, among others. The ensuing report went back through Moulton to the Permanent Secretary of The Board of Trade. It had recommended that research on the properties of glass and the most efficient way of manufacturing glass, be undertaken at the National Physical Laboratory. Both of these suggestions were duly enacted by the Government.⁵⁰

The Guild was beginning to be recognised as a useful scientific resource in the formulation of policy. However, ideally the scientists would have preferred to have the Guild, or a body like it, officially recognised and given an institutional position above the rest of the machinery of government.

1.3 CONCLUSION

The Edwardian scientific community had developed a new and radical political objective. No longer were scientists content to campaign simply for public money. The chief goal was now the achievement of political power via the mechanism of a scientific council with executive powers. The rhetoric in which this aim was pursued was based on a definition of national problems in terms of science and an assertion that scientific experts should make policy.

However, what had caused the political radicalisation of scientists? In part, I argue, the motivations were internal to the scientific community. Scientists themselves saw involvement in policy as the natural culmination of the professionalisation of their discipline. But, there were also external influences at work. Firstly, the intransigence of the traditional

⁵⁰ See British Science Guild: Ninth Annual Report (1915), p. 13. Different accounts of this episode can be found in Roy and E.K. MacLeod, 'War and Economic Development: Government and the Optical Industry in Britain, 1914-1918', in J. Winter (ed.), War and Economic Development: Essays in Honour of David Joslin (Cambridge, CUP, 1975), pp. 165-204; and MacLeod, 'Science for Imperial Efficiency...', *op.cit.*, pp. 170-2.

political authorities in the face of repeated requests for funding and social recognition for science, and secondly, the particular social and political context of Edwardian Britain. I want to suggest, however, that there was also a deeper level of external causation at work here. Roy MacLeod has argued that the political influence of scientific experts within government departments was being progressively eroded from about 1870 onwards. He has described this as a 'dilemma of departmentalisation'. He further argued that this process continued in the 'triumph of law', which saw the almost complete political emasculation of the scientific expert and the increasing dominance of the generalist civil servant, a state of affairs which MacLeod saw continuing into post First World War Britain.⁵¹

MacLeod's analysis of the fate of scientific experts at the hands of generalist civil servants, corroborates Peter Gowan's radical re-interpretation of the existing historiography of the development of the British civil service.⁵² Gowan sees the transition from the pre-Northcote-Trevelyan civil service, where experts could acquire power, to a reformed civil service, in which power was held exclusively by Oxbridge educated generalists, increasingly independently of the reformed parliament, as one of great importance. This argument runs counter to the general tenor of earlier literature on the development of the British State, which saw a corrupt civil service being replaced by a meritocratic service, where office was open to all on the basis of talent. In fact, as Gowan shows, it was only open to a very special kind of talent, or brand of expertise, which did not include the narrow specialism of middle class scientific experts. This Gowan insists was a central aim of civil service reform.

I would suggest that the continuing enshrinement of a generalist bias in the political culture of the British State is an important factor in the politicisation of the scientists. This bias blocked what many scientists perceived as the further progress of the professionalisation of their discipline. The situation came to a head in the Edwardian period because of the heightened intensity of criticism of the State after the Boer War, and in the tense international

⁵¹ Roy MacLeod, Introduction to Government and Expertise..., *op.cit.*, p.16.

⁵² Peter Gowan, 'The Origins of the Administrative Elite', New Left Review, No. 162, (1987), pp. 4-34.

climate of these years. I am thus adding to both MacLeod's and Gowan's analyses by providing a case study of a particular expert group. Having been excluded from administrative power by generalist civil servants, the scientists claimed political power not within departments but above them, via a scientific national council, as the BSG argued.

These campaigns continued into the war years, and, very soon, the public scientists enjoyed considerable success, as the demands of the wartime emergency resulted in the State allowing scientists increased access to government service. This only intensified the public science arguments, and imparted a new slant. The aim now was to consolidate these gains and have them formalised as an integral part of the machinery of government. This story is told in the next two chapters.

CHAPTER TWO

A WAR OF WORDS: PUBLIC SCIENCE IN BRITAIN, 1914-16

The Promised Land is in sight, and must be won.¹

This chapter will examine the form and content of the arguments produced by the British scientific community during the First World War to gain influence over government policy-making. The bulk of the existing literature on British science in the First World War (like the corresponding literature on the Edwardian period, which was considered in the previous chapter) discusses the political aspirations of scientists only in the very limited sense of noting public campaigns to secure better funding for science, and social status for scientists, on the back of a clearer public perception of the worth of scientific enterprise in wartime. Most accounts go on to talk about the attitude of the State to science (rather than of science to the State), and detail the setting up of the various State sponsored schemes for civilian scientific research, for instance the Department of Scientific and Industrial research (DSIR).²

Roy and Kay MacLeod have identified a more radical political rhetoric, but have argued that scientists' involvement in politics was not an issue until the 1920s. In the aftermath of war scientists were faced with the moral issue of the social uses of science as either creator or destroyer. Should they attempt to intervene in policy to guide the use of

¹ *Nature*, Vol. 97, 20 July 1916, p.418

² See Hilary and Steven Rose, *Science and Society*, (Harmondsworth, Penguin, 1970); Peter Alter, *The Reluctant Patron: Science and the State in Britain, 1850-1920*, (Oxford, Berg, 1987); D.S.L. Cardwell, *The Organisation of Science in England*, (London, Heineman, 1957). *The Government of Science in Britain*, J.B. Poole and Kay Andrews (eds.), (London, Weidenfeld and Nicolson, 1972), a collection of primary sources with minimal commentary, covers the same ground though its extracts do give some indications of the broader concerns of British scientists. As David Edgerton has recently pointed out, such accounts focus almost exclusively on so-called civilian science, when the expenditure of the DSIR was paltry when compared to that of the service departments. The few existing accounts of military/naval research largely concentrate on the new bodies through which civilian scientists entered the machinery of government. See David Edgerton, 'Liberal Militarism and the British State', *New Left Review*, No. 185, (January/February 1991), pp. 138-69. The existing accounts include: Roy MacLeod and E. Kay Andrews, 'Scientific Advice in the War at Sea, 1915-1917: the Board of Invention and Research', *Journal of Contemporary History*, Vol. 6, (1971), pp. 3-40; Michael Pattison, 'Scientists, Inventors and the Military in Britain, 1915-19: The Munitions Inventions Department', *Social Studies of Science*, Vol. 13 (1983), pp. 521-68; Steve Sturdy, 'From the Trenches to the Hospitals at Home: Physiologists, Clinicians and Oxygen Therapy', in J.V. Pickstone (ed.) *Medical Innovations in Historical Perspective*, (Houndmills, Macmillan, 1992), pp. 104-23; Roy MacLeod, 'The Chemists go to War: The Mobilization of Civilian Chemists and the British War Effort, 1914-18', *Annals of Science*, Vol. 50, (1993), pp. 455-81. However, some accounts do explore the development of science in the services, as well as looking at the wartime relations with civilian science. On this see, for example, L.F. Haber, *The Poisonous Cloud: Chemical Warfare in the First World War*, (Oxford, Clarendon Press, 1986); and Guy Hartcup, *The War of Invention: Scientific Developments, 1914-18*, (London, Brassey's Defence Publishers, 1988)

science down a path more in keeping with their own (liberal) image of science ? In this context, some scientists chose to desert their ivory towers and associate with political groups such as the Guild Socialists, the Labour Party and even the Communist Party. The MacLeods have argued (quoting the Cambridge Magazine of 1918) that:

In Britain, political action among scientists was motivated, not only 'for a desire for much higher remuneration...decent status and social standing', but by a social and political vision 'of the possibilities in science, whether pure or applied, of man-power and organisation.' In response to such a vision, left wing 'scientific outsiders' demanded for scientists not only a share in the profits of research, but a voice in the internal management of research.³

However, there was no suggestion here that scientists were politicised in a similar way during the war, much less before it. The British Science Guild, for example is described in a footnote as functioning as 'a scientific "ginger group" for the promotion of scientific research and education'.⁴

In this chapter I will focus on the scientists' attitude towards the State. I will argue that the scientific community produced two kinds of public science during the war. Public scientists perceived the extreme national test of war as the perfect opportunity finally to convince the public and politicians of the truth of the arguments of Edwardian public science: that science and scientists should play a much greater role in national life. Increased government demand for the services of scientists during the war, as well as the increased sense of community and solidarity that such war work produced amongst scientists, meant that the more moderate and traditional aims of public science (more State funding for science, a national science policy and better pay and social standing for scientists) were also pursued with a new vigour.

Furthermore, the radical political rhetoric, which was examined in the previous chapter, was also now given a new stimulus. This rhetoric was similar in form and content to the Edwardian rhetoric, but was given an added potency, and furnished with more imperative arguments in the crisis of war. Public scientists felt that wartime emergency conditions might make politicians more ready to grant concessions and open up the machinery of government to scientists, perhaps even to the extent of giving them a formal position within it.

³ Roy and Kay MacLeod, 'The Social Relations of Science and Technology 1914-1939', pp. 301-63 in C.M. Cippolla (ed.) The Fontana Economic History of Europe: The Twentieth Century Vol. 5 Pt. 1, (Glasgow, Collins/Fontana, 1976); p.325. They quote the Cambridge Magazine, 16 February 1918, pp.445-6.

⁴ MacLeods, Ibid., p.303, footnote 1

I want to argue, then, that as in the Edwardian period the main thrust of this rhetoric was technocratic: that scientists should be entrusted with executive power over general policy. The mechanism for this power was again to be some kind of formal, institutionalised, national scientific council. This body would sit above all other departments of government, and would be automatically consulted in the framing of all policy which could be broadly defined as containing a scientific element. This body would not simply react to government requests for advice, but would have the power to make independent, but binding, policy recommendations. I will further argue that the public scientists wanted this new body to have authority not only over the direction of so-called civilian industrial research, but also over the policy programme for military and naval research and development.

However, I will also indicate that , although there was a general consensus within the scientific community about the need for a formalisation of influence, a difference of opinion about the best institutional mechanism to embody this surfaced during the war years. The Nature/BSG circle at first continued to press for a new body of scientists to be incorporated at an executive level within the machinery of government. The Royal Society (or influential sections of its Council) favoured a subtly different line which, I argue, it felt to be more in tune with the State's attitude towards outside expertise, and thus more likely to ensure policy influence. This was to allow the government to create its own new bodies for the management of science, but to ensure that these new bodies were made up of eminent scientists. These bodies could then be used as forums for co-ordinating more general policy influence, especially because informal contacts could be maintained between their eminent heads. In fact an informal technocracy composed of scientific chiefs could be created in this way. This approach, it was felt, harmonised more fully with the changing attitude of the State toward the influence of outside expertise on policy. The crisis of war, I will argue, brought great and lasting changes in this attitude, but not a complete *volte face*. The State became more willing to allow experts in general improved access; but they were still preferred to remain on tap, rather than on top. The beauty of the Royal Society model (which, as will become clear, was worked out directly with sections of the government) was that it allowed scientists more formalised influence, but on the State's terms. Thus it did not offend against the tacit principle of (at least nominally and publicly) protecting the inner

sanctum of the art of policy-making (with all its mysteries intact) as the sole preserve of politicians and civil servants.

By the later war years, the majority of the scientific community had come to accept the Royal Society model, and it became enshrined in the DSIR and the other Research Councils, as well as embodied in the Haldane Report on the machinery of Government.

2.1 CHARACTERISTICS OF THE RHETORIC: A BRIEF SURVEY

The war which Edwardian public science had prophesied was to be the first scientific war. It would require not only the development of ever more deadly weapons technology and the adequate supply of munitions of war, but would also demand the scientific organisation of all aspects of national life. The German threat had been portrayed as essentially scientific: technological, organisational and educational. It was thus used not only as the basis of arguments for greater executive direction of a national scientific policy by scientists, through a national scientific advisory council, but also to argue that scientists should frame more general policy. To keep ahead of Germany, Britain had to outdo her in centrally organised and directed civil and military science, and had to base all political decisions on scientific considerations, shorthand for considerations of national power. Science was not conceived narrowly but was 'a Latin word for the best way of doing what is to be done'.⁵

After the outbreak of the predicted war the majority of the scientific community felt that their argument for control of policy now possessed a new and pressing relevance. In an unsigned editorial in February 1916 Nature noted that the war had caused an 'awakening' to the truth of Norman Lockyer's prophetic 1903 address to the British Association on 'The Influence of Brainpower on History' (the key text of Edwardian public science which, as we noted in the previous chapter had spawned the British Science Guild):

⁵ Sir William Osler, 'Science and War', address to the Leeds Medical School, 1915, as reported in Nature, Vol.96, December 16 1915, pp.431-3; p.431. For a discussion of the uses made of the concept of scientific method in public science, mainly in the 19th century, see Richard Yeo, 'Scientific Method and the Rhetoric of Science in Britain, 1830-1917', pp.259-97, in The Politics and Rhetoric of Scientific Method (Historical Studies), Yeo and J.A. Schuster (eds.), (Dordrecht, Reidel, 1986).

We have waited a long time for public enlightenment as to the relation of science to national affairs....Now that the war has shown the truth of the predictions of our scientific Cassandras, there is more reason to believe that action will be taken to avert the consequences of neglect in the past and to provide the scientific community the conditions of advance in the future.⁶

Public scientists stressed that this was a war of chemists and engineers which would daily prove that their claims for policy control were not only justified but essential to victory.

Nature observed in December 1915 that:

Today, considerably more than a million of our fellow countrymen...are pursuing their scientific studies at an open-air German university under conditions which compel their undivided attention. Many of them realise very forcibly that the advantages possessed by their enemy instructors are due entirely to scientific organisation. When our soldier-students return to civil life will they insist upon scientific control of all national affairs? In that possibility lies our strong hope.⁷

Public science thus argued that Britain should have a comprehensive, centrally controlled science policy. Sir William Ramsay⁸ wrote in Nature in October 1914 that 'This war in contradistinction to all previous wars, is a war in which pure and applied science plays a conspicuous part' and called for the mobilisation of the Fellows of the Royal, Physical, Chemical and Engineering Societies.⁹

Editorials and articles in Nature were also arguing that scientists themselves should have control of science and more general policy, because of the importance of science to national power, particularly in wartime, and because the scientific method was the only foolproof way of making political decisions. Throughout late 1915 and early 1916 Nature carried many expressions of such sentiments: from criticisms of the scientific qualifications of civil servants and 'lawyer-politicians'¹⁰ which rendered them unfit to govern a modern state, to direct attacks on the system of democratic government. Many of these criticisms were sparked by a hostility to the Government's organisation of schemes for promoting scientific and industrial research. As we will later see, many scientists perceived these as

⁶ 'Defects and Remedies', anonymous editorial, Nature, Vol.96, February 10 1916, pp. 643-4: 644.

⁷ 'Scientific Research and the Chemical Industry' anonymous opening editorial, Nature, Vol.96 (1915-16), 30 December 1916, pp.475-6:p.476.

⁸ Sir William Ramsay (1852-1916). FRS; KCB. Scottish chemist educated at Glasgow and Tübingen. Professor of Chemistry at University College, London.

⁹ Sir William Ramsay, p. 221, 'Science and the State', unsigned editorial in Nature, Vol. 94, October 29 1914, pp.221-2.

¹⁰ This phrase represents a common complaint against the domination of lawyers over scientists in the House of Commons. Rather ironically perhaps, lawyers were considered to be concerned only with persuasive rhetoric, and this was unfavourably contrasted with the scientist's dogged pursuit of truth via the scientific method. The phrase is from a brief notice of Professor E.B. Poulton's Romanes Lecture on 'Science and the Great War' of December 7 1915, which appeared in Nature's 'University and Educational Intelligence' column on December 9, (Vol.96, p.415).

falling short of the kind of influence they desired. They were given a small advisory role but were put firmly under the control of generalist bureaucrats who were able to filter scientists' influence on policy. Thus many arguments were aired for the scientist to be on top rather than on tap. These included assertions that scientific method was transferable to all policy problems, and that the very pursuit of scientific enquiry by the scientific method inculcated a higher moral sense, essential for the right direction of national affairs. For example in late 1915 a Nature editorial complained that,

Though science enters into every part of modern life, and scientific method is necessary for success in all undertakings, the affairs of the country are in the hands of legislators who not only have little or no acquaintance with the fundamental facts and principles signified by these aspects of knowledge, but also do not understand how such matters can be best used to strengthen and develop the State. Our administrative officials are also mostly under the same disabilities, on account of their want of scientific training.

Noting that the want of science in the public school curricula and the Civil Service exams were to blame for these deficiencies, the writer concluded that,

... the result of it all is that science is usually regarded with indifference, often with contempt, and rarely with intelligent appreciation by the statesmen and members of the public services whose decisions and acts largely determine the country's welfare.¹¹

It was at this point that the radical public science which was arguing for policy influence shaded off into the more moderate and traditional arguments of public science. The achievement of a more scientifically orientated system of education and of entrance exams to public service were ends in themselves. Like arguments for better funding for science and better salaries and career prospects for scientists, they were partly meant to increase the economic and social status of scientists. As such they have received ample attention in the existing accounts of the relations of science and the State in this period.¹² However, what has not been fully understood, and what I want to stress here, is that such arguments were not separate from but related to the radical claim for influence over policy. It was anticipated that more science in school and university curricula would bring scientists closer to power in three ways. Firstly, politicians and Civil Servants with a background in science would better appreciate the national importance of science and the need to involve

¹¹ Nature editorial, 'Defects and Remedies', *op.cit.*, p.643.

¹² See the accounts referred to in footnote 1. See also for example: D.S.L. Cardwell, 'Science and World War One' pp. 447-56, Proceedings of the Royal Society of London, Series A, Vol. 342 (1975), especially pp. 452-3; and Ian Varcoe, 'Scientists, Government and Organised Research in Great Britain 1914-16: the Early History of the DSIR', pp.192-216, Minerva, Vol. 8 (1970).

scientists in decisions. Secondly, a general public so educated would demand that its public leaders and officials were more aware of science and scientists. Finally these moves would also provide more science graduates to take up influential positions in the State service and in political life, thus ensuring a better future position for scientists. Furthermore, better pay and status would attract more graduates to become scientists, as well as making scientists appear to be a responsible and trustworthy professional group.

The final aspect of the rhetoric I want to highlight is that the scientists were arguing for influence over policy not just for the duration, but for the coming peace as well. They intended to use the war to force a change in the British system of governance, making it more technocratic. Thus the scientists claimed even in 1915 that new scientific methods of policy-making were also essential to maintaining Britain's commercial and industrial supremacy against a militarily defeated, but still economically threatening, Germany. Professor J.A. Fleming¹³ stressed this theme in October 1915. After first criticising the 'special defect(s)' of the democratic form of government as an over-estimation of the value of skill 'in oratory and debate', he continued that the scientific method must be used in the future because,

It must be remembered that, after this war is over in a military sense, we shall immediately commence another war of a different kind, in which the weapons will not be bullets and shells, but our national powers of invention, scientific research, commercial organisation, manufacturing capabilities, and education, and these will be pitted against those of a highly organised Germany determined to win back in commerce...that which has been lost in war....We have said good-bye now and forever to those easy-going amateur British methods...

Fleming imagined, for instance, that the scientific learned societies should, after the war, take a large role in the direction of industrial research, like that of supervisor to student, or 'like the general staff of an army towards the subordinate generals and corps commanders'.¹⁴

This section has given an overview of the form and content of the public science of the war years. The rest of this chapter will concentrate on the central aim of the radical part

¹³ Sir John Ambrose Fleming (1849-1945). Lancaster born electrical engineer. Educated at University College, London; Royal School of Mines ; and St. John's College, Cambridge. Pender Professor of Electrical Engineering in the University of London. Interested in wireless telegraphy and inventor of the oscillatory valve as detector and the Cymometer to measure wave lengths. *F.R.S.*

¹⁴ J.A. Fleming, 'Science in the War and After the War' an Introductory lecture at University College London, 6 October 1915, as reported in *Nature*, pp. 180-5, 14 October 1915, Vol. 96, p. 184-5.

of the rhetoric: the establishment of a formally recognised Science Council. Although the related arguments of education, pay and prospects at one level feed into this, as I have indicated, the war years were perceived by scientists as a special opportunity to gain the central aim. Thus there were many more examples of scientists arguing for a central scientific bureau with power to make policy even than in the Edwardian period. However, I will refer to the wider rhetoric when this becomes particularly relevant to the central political aim. It should also be noted here that towards the end of the war, for reasons I will explore in the next chapter, these related themes became increasingly important as the scientists perceived that a different rhetorical strategy was required to achieve the central aim.

2.2 THE EXPRESSION OF THE IDEA OF THE NATIONAL SCIENCE COUNCIL, FROM 1914 TO THE ESTABLISHMENT OF THE DSIR IN DECEMBER 1916

In an editorial in Nature in late October 1914, Sir William Ramsay called for an organisation to put every scientist to work devising means of defeating Germany. Ramsay argued that The Royal Society should take a lead in organising science for war. It should set up committees on a voluntary basis, and co-opt members of other scientific societies onto them.¹⁵ By early 1915, with the disturbing revelations of a munitions crisis,¹⁶ the scientific community began a concerted campaign to secure meaningful input into policy decisions. The Royal Society had apparently been unofficially informed of imminent Government plans for the establishment of a formal body of scientists to advise on scientific and industrial research. It also appears that the Society gave a positive response to these plans to Christopher Addison, Parliamentary Secretary to Joseph Pease, President of the Board of Education.¹⁷ But still, on 6 May the Royal and Chemical Societies, together with the Society of the Chemical Industry, the Institute of Chemistry, and the Society of Public Analysts, sent a deputation to meet the Presidents of the Boards of Education and Trade

¹⁵ 'Science and the State' unsigned editorial (by William Ramsay), pp.221-2, Nature, Vol. 94, October 29 1914, p.221.

¹⁶ Crucial in alerting the public and the Government to the shell crisis, and perhaps speeding the establishment of the Ministry of Munitions, was the report of the Times War Correspondent, Lieut.-Colonel C. à Court Repington, which appeared on 14 May 1915. In it he claimed 'that the want of an unlimited supply of high explosive shells was a fatal bar to our success' See his The First World War Personal Experiences, Vol. 1, (London, Constable, 1920), especially pp.34-40.

¹⁷ Addison wrote in his diary on 3 May that the Royal Society were 'highly delighted with the news'. From Addison, Four and a half years, (London, 1934), p.74. Cited here from Roy MacLeod, 'The Origins of the DSIR: Reflections on Ideas and Men, 1915-16', p.30, Public Administration, Vol. 48 (1970), pp. 23-48.

(Runciman). The scientists urged the importance of immediately setting up a permanent Standing Committee to act as an intelligence department. It would form a link between universities, colleges and industry, and should also serve as a scientific advisory body to the Government.¹⁸ On 13 May Pease announced in the House of Commons the intention of the Government to appoint an Advisory Council on Industrial Research. Pease stated that: 'I want a Committee of experts who will themselves be able to consult other expert committees working in different directions....[and]...associated with leaders of industry'.¹⁹ The new body was to advise on the best disbursement of funds for conducting research into industrial problems like glass, hard porcelain and technical optics, which were perceived to be of key importance in the war and after.²⁰

While welcoming this development, the scientists did not trust the judgement of the Cabinet in carrying the scheme through, particularly after the disappointments surrounding the recent handling of the establishment of British Dyes Limited.²¹ Ramsay made more detailed suggestions about the organisation of a 'Chemical Council of State' in his leader in Nature of 20 May. In proposals which he claimed to have formulated around March 1915, he argued for a body of about twenty four members: one third technical chemists, one third scientific investigators and one third analytical and consulting chemists. Its duties would be to compile a register detailing the nature of every British chemical works; to provide an interface between universities and industry; and 'To advise the Government on questions involving a skilled knowledge of chemistry and its applications'.²² The Council would resemble a permanent Royal Commission, and would report at least annually to the Government. The Council would not be formally attached to any Government department, but would be associated with the Boards of Trade, Agriculture and Fisheries, Local Government and Education, and the Government laboratories. To ensure a non-political appearance it would be directly responsible only to the Crown. It would thus be an independent but formally recognised advisory body which departments should consult on all scientific matters. Ramsay wanted the choice of personnel to be supervised by the President

¹⁸ See 'The Government and Chemical Research', anonymous article in Nature, Vol. 95, 13 May 1915, pp.295-6.

¹⁹ Pease's remarks are cited from 'An Advisory Council on Industrial Research', p.322, Nature, Vol. 95, 20 May 1915, pp. 321-327. The article reproduced much of the Commons debate referring to the ASCIR from Hansard, Parliamentary Debates, 5th Series, Vol. lxxi, No. 52.

²⁰ Ibid., p. 323.

²¹ William Ramsay, 'Science and the State', leading article, Nature Vol.95, 20 May 1915, pp.309-11.

²² Ibid., p. 310.

of the Royal Society (Crookes²³) and a small committee of four eminent chemists (themselves to be members of the Advisory Council), who would then select twenty suitable names.²⁴ Ramsay stressed the need for such expert input into the scheme, writing that: 'It is earnestly to be hoped that members of the Government will agree to adopt some such scheme....[and]... will, in this case at least, trust the expert'.²⁵

This editorial tapped in to the key contemporary debate in the scientific community. There was generally a consensus about the need for the central organisation of scientific policy by the scientific community, but exactly how was this to be achieved institutionally? The debate centred on whether the Royal Society itself should become the officially recognised (though quasi-autonomous) centre for the direction of science policy, or whether the German example should be followed, and the new body for the organisation of science should be a new government body (though doubtless composed of the same eminent scientists who made up the Society's Council), and thus part of the State apparatus. This debate was complicated by the traditional reluctance of the Society to become involved in any form of politics, lest it corrupt its objective public image. The writer of an anonymous letter to Nature of 20 May clearly articulated the concerns. He,

...understood that the Royal Society, though it is, for some purposes, a representative body, does not regard itself as the proper body to take the initiative in approaching the Government for the support of a new scientific project.

He noted that while there was a system for getting new funds for research it was traditional, 'haphazard' and above all informal. There was no officially recognised organisation of science policy; it was all a matter of informal contacts between eminent men and government:

We are...by no means devoid of organisation; but what we have is almost venerably historic and very elaborate; but it is long and tortuous and sadly inefficient...for obvious reasons.

The writer called upon the Royal Society to recognise that since the State was the only possible source of sufficient funds to conduct the kind of science needed by a modern

²³ Sir William Crookes, OM, FRS, (1832-1919): old style aristocratic chemist who did not hold an official university post, and was not university trained. Discovered Thallium in 1861; repulsion resulting from radiation (1873); radiometer (1875); illumination of lines of molecular pressure (1878); radiant matter (1879); radiant matter spectroscopy (1881); genesis of elements (1887); spinthariscopes (1903). Member of all the important professional associations (and of the Society for Psychical Research from 1897). Published books on the chemistry of food and dyeing among other subjects. Worked in laboratory at the Royal Institution from 1881 to his death.

²⁴ *Ibid.*, p. 310-11.

²⁵ *Ibid.*, p. 311.

society, the organisation of science policy needed to be modernised and formalised in co-operation with that State. At present, it was argued, science was sustained by private effort and token government grants, which conferred 'public responsibility, but no official prestige and no official purpose'. The scientific societies adopted the attitude that government support discouraged private effort, purely because the existing situation left them in loose control of science. For its part, the State was reluctant to spend money on science, and thus only too glad to be advised that government funding was counter-productive. The key objective of public science must be the end of this cosy and complacent situation:

Among the changes which will follow the war, whatever the issue may be, the reorganisation of scientific effort must find a place. All the after-dinner speeches about the parsimony of the Treasury, and all the complaints in Science Progress and at the meetings of the British Science Guild, punctuated by what has been brought to light since the war began, mean at least that.

There must be a formalisation of the methods of arriving at science policy, the only question was the means: would the Royal Society take on an official role or was this to be left, as in Germany, to the State in the form of a new government body of scientists:

...only we must have a way which is recognisable and recognised. Behind the Government, whether in association with a special Minister or not, there must be a powerful advisory committee with facilities for initiation as well as discrimination, [i.e. of and between what science was to be done] a sort of Privy Council for Science with public responsibilities, to whom the public as well as the Government can appeal....Before that can be established the Royal Society must settle what its function is to be....[my emphasis]

The writer was himself not convinced that the Society was the ideal body: its full membership at 450 was too large to be effective, and its Council at 21 was too small and 'too much selected for the purposes of personal discrimination, too transitory, too full of work of other kinds, too much unpaid, and not sufficiently representative of the subjects with which a national organisation must deal'. The writer ended by issuing a challenge to the Society to issue a scheme for the scientific control of science policy:

The point is obviously a difficulty; but in the long last it can only be settled in one way, and the sooner the Royal Society takes the field with a proposal for an initiating and discriminating advisory body other than its own Council the sooner will it be possible to take a definite step in the direction of the national organisation of scientific effort.²⁶

²⁶ All quotations from anonymous letter to Nature, published in 20 May edition, pp. 315-7, Vol. 95, (1915).

The Nature/BSG centred public scientists kept up the pressure for a powerful, formally recognised channel of scientific policy advice throughout June and July of 1915. Some of this dwelt on the theme of the role of the Royal Society, but now even this, like the wider criticism of the organisation of scientific resources, was much influenced by the continuing reverberations of the shell crisis, and dealt specifically with the organisation of scientific research for the immediate prosecution of the war by the fighting services.

The Royal Society had already established a War Committee on 5 November 1914, and between then and 12 May 1915 four sub-committees were set up dealing with telephony, wireless telegraphy, and general physics; chemistry; engineering; and war trades, respectively. On 24 June 1915 the Council constituted itself an executive Committee, the 'Royal Society (War) Committee', with sectional committees on chemistry, engineering, physics, physiology, and grain pests.²⁷ This latter change was in response to continued criticism. Richard Gregory's friend, Professor Henry E. Armstrong, the chemist and pioneer of scientific education,²⁸ had suggested as early as 20 January 1915 that the Society should group all of its Fellows by subjects in 'Grand Committees' and set to work on war problems. When this had not been done by June, he wrote to the Times arguing that 'in view of our scientific conservatism...it is difficult to find much fault even with our rulers'.²⁹ He stressed that the strongest possible body of technical opinion should be behind the War Office and the Ministry of Munitions in the form of a 'committee of concentrated scientific intellect to deal with war problems', which 'must be in expert hands to be of service'. He argued that the government was not competent to select members for this new body, this could only be entrusted to the Royal Society. It was, he insisted,

the only competent advisory body under the circumstances - it is our scientific House of Peers, and if it cannot either itself furnish sufficient competent men or provide them from the junior ranks of science, the sooner it is declared defunct the better.

²⁷ Details taken from brief discussion of the war-time organisation of the Royal Society in M. Teich, 'Scientists and Food Policy in Britain and Germany', (originally conference paper 1991 [?], forthcoming, 1994, as part of edited collection).

²⁸ Gregory had apparently met Armstrong at the BAAS Liverpool meeting in 1896, and the two were promoters of the establishment of a new section to deal with science in education. See W.H.G. Armytage, Sir Richard Gregory: His Life and Work, (London, Macmillan, 1957), p. 32.

²⁹ Armstrong, letter to Times, 21 June 1915, p. 9, 'The Organization of Science'.

Armstrong had not been asked to help in any official capacity, and this partly fuelled his anger. But his wider point was that the existing informal methods of organizing Britain's scientific resources - a few eminent Fellows selected to serve on ad hoc committees - were not adequate. He asserted that:

No half-dozen or so persons, at the present time, have the right to assume that they can do all that is required in any branch of science; no small number have the right to push their colleagues aside and say we alone will serve the country.

He again urged that,

unless the Royal Society be organized as a whole forthwith in the service of the State, as well as provided with an efficient active executive in full sympathy with the situation, we shall deservedly sink into insignificance, because the peers of science will have shown themselves to be collectively impotent and without due sense of their public responsibilities.³⁰

Armstrong broadened his attack on the Royal Society and its reluctance to become involved in any official capacity in the central organisation of either industrial or warlike research and advice to government in an address to a mixed audience of chemists and industrialists at the Annual General Meeting of the members of the Society of the Chemical Industry on 15 July 1915. One of his major complaints was that the inaction of the Royal Society had led to the fragmentation of the voice of science. The various learned societies had been forced to pursue independent initiatives to push the claims of science to a voice in national affairs. Government inertia to incorporate outside scientific experts had thus been strengthened.³¹ He argued that public ignorance of science and government resistance to scientific advice was largely the fault of a disorganised scientific community:

The fault is largely in the body scientific: we do not push our own interests sufficiently; I much fear that the one service that will remain unorganised to the end is our own body - the body scientific. Seemingly we are too hopelessly individualistic to organise ourselves. The Royal Society, which should be the supreme authority in science, declined the task early in the year and it is not likely that those who know us not, our masters the politicians, will seek to bring us together, even for their own ends, as they have no understanding of the use to which we might be put in their service....³²

Armstrong argued that two forms of organisation were needed: internal and external. Internally, science needed to become more professional. If science wanted to enjoy the easy

³⁰ All quotes above, *Ibid.*

³¹ Armstrong (SEE FOOTNOTE 32 IMMEDIATELY BELOW FOR FULL REFERENCE).

³² Henry E. Armstrong, p. 75, 'The Development and Control of Industry by Public Influences', Address to the AGM of the members of the Society of the Chemical Industry, Manchester, 15 July 1915. As reported in *Chemical News*, Vol CXII (1915), 13 August 1915 edition, pp. 75-9.

access to political power that was the one of the hallmarks of a respected and trusted profession, it must more rigorously take on the other organisational attributes of professionalism. With status would come respect, and with respect, authority. The continuing lack of respect for scientists on the part of the public and politicians was the reason why, for instance, two of the Royal Society's own War Committees (Physics and Chemistry) had not been given anything important to do. However, the other committee (Engineering), had rendered important service to the Government. Armstrong asked,

Why the difference? Is it not that engineers, like Brutus, are not only honourable, but honoured men, in the sense that they are a professional body, better said perhaps, a body of professionals - accustomed to work together, having learnt that it often pays men to work together? 'Union is strength' is their motto.³³

Armstrong believed that the only way to win influence was to become a properly organised professional group. This process involved three key elements. The first was to take on some of the functions of a trade union (as happened with lawyers and medical men) and work only for payment. The second was to dispel the image of the cloistered academic, by involving the universities more closely with practical industrial problems. This would make industry and government more willing to approach scientists. The third was to make the educational curricula reflect both the pure (academic) and applied (industrial) aspects of science. This would make the scientists of the future more appealing as advisers, especially to a future ruling elite themselves now more receptive to the importance of science.

Only when the scientific profession had thus perfected its internal organisation, could it begin to achieve influence in national affairs. But to achieve this, better organisation of the external relations of science was also needed. As Armstrong pleaded,

Our plain duty in this Society is to organise ourselves and when we are organised to claim the right to guide Government. But unless the representatives of science subordinate their individualism, sink their differences and form a complete coalition of their forces, no public impression will be made.³⁴ (original emphasis)

It was in this latter context that Armstrong criticised the fragmented way in which science presented its services to the government. Instead of the multitude of learned societies and

³³ *Ibid.*, p. 76. For similar criticisms of the professionalism of science see also, C. Scott Carrett, 'Government and Chemistry', *Science Progress*, Vol. X (1915-16), No. 39, January 1916, pp. 469-74.

³⁴ Armstrong, *op.cit.*, p. 78.

new bodies each claiming an advisory role, the Royal Society should be the single, officially recognised interface between science and government:

It rests with the Royal Society...to give the impulse and start reform, by reforming itself, waking up from its academic slumbers and playing the active part that it is possible for it to play if it only realise what it can do as a live institution. It is our scientific House of Peers....In consequence of the development of the special societies, the Royal Society is no longer of consequence as a scientific society, in the ordinary sense. Unless the forces at its disposal are used effectively, it will cease to be of service....The Fellows will fail in their duty to the Empire, unless the Society grasp the power which is potential in its hands and claim to be supreme as a deliberative and advisory authority in the interests of science. The voices of scientific workers in our country should be heard as that of one man, through the Royal Society - we should then count for something in the National Councils; it should co-ordinate our scientific forces and link them up with our educational as well as with our industrial system - we should then play our due part in the State.³⁵

However, in Armstrong's opinion, the Society must also be democratised, not run by and for a small clique:

...at present it is little short of entirely in the hands of a ring of all but permanent, autocratic officials and the Fellows have but little part in its proceedings, as the Council in no way represents the desires and ideas of the Fellows.³⁶

This kind of criticism of the Royal Society was echoed by Professor Fleming in October, in a lecture reprinted in Nature.³⁷ Ronald Ross complained in January 1916 that scientists' lack of a unified programme undermined their efforts to remedy the neglect of science: 'Men of science are themselves mostly to blame for this state of things. They show no solid front and have no courage in enforcing their demands'.³⁸ He also castigated the Royal Society and the learned societies as corrupt in Science Progress editorials.³⁹

Meanwhile, another of Gregory's personal friends and a BSG member, H.G. Wells, further pressed the case for more involvement of the scientific man and method in the conduct of the war. In a letter to the Times of 11 June, Wells demanded:

... some supplementary directive force, some council in which the creative factors in our national life, and particularly our scientific men and our younger scientific soldiers and sailors, have a fuller

³⁵ Ibid., p. 79.

³⁶ Ibid.

³⁷ See note 12.

³⁸ Ross, letter to Nature, 'The Organisation of Science', op.cit., p. 536.

³⁹ See for instance 'Notes' in Science Progress Vol. XII (1917-18), pp. 125-6.

representation and a stronger influence than they have in our present Government. It is not the sort of work for which a great legal and political career fits a man....A great politician has no more special aptitude for making modern war than he has for diagnosing diseases or planning an electric railway system. It is a technical business. We want an acting sub-Government of scientific and technically competent men for this highly specialised task.⁴⁰

On 17 June, an unsigned leading editorial in Nature quoted this letter approvingly, and added its own further call for the formal incorporation of scientists into the direction of the war:

There are hundreds of men of science in the country whose energies and expert knowledge are not being effectively used. We should possess a scientific corps, with men investigating at the front as well as at home, instead of one or two committees advising officials as to possible means of offence or defence....We know that up to a certain point the scientific resources of the country have been drawn upon, but beyond the fact that one man is working at explosives, another at the Royal Aircraft Factory, and a third is testing for the Admiralty, we want to feel that these are only details of a wider scheme so perfect in its organisation that the full effect of our forty-five millions of people is brought to bear upon the enemy.⁴¹

Wells' ideas also prompted a barrage of supportive letters from leading scientists from all over the country offering practical suggestions for the make-up of the proposed war research body.⁴² Wells himself added further thoughts, in a letter of 22 June, on the operations of a 'science and invention bureau':

Essentially I see it as a small department collateral rather than subordinate to the War Office and Admiralty....the business of the bureau will be...to stand between these great administrative departments and the flood of crude and imperfect suggestions that beats upon them so distractingly...it will examine, test, and develop these, and present such as are found suitable in a finished form ready for use to the fighting department. The bureau would, I think, do its work best if it were a responsible official bureau, because then it would have comparatively free access to official information; it would know more exactly what was being done and what needed to be done.⁴³ (my emphasis)

Wells further suggested that the bureau would compile indices of scientific personnel and their specialisms, and suitable laboratories. A central directorate would farm out suitable projects to this 'galaxy' of scientific expertise.⁴⁴

The above arguments of public scientists contained three strands of criticism of the organisation of science: that the Royal Society was not taking the lead in central

⁴⁰ H. G. Wells, letter to the Times, 11 June 1915. Cited here from pp.61-3, Poole and Andrews, op. cit., p.63.

⁴¹ 'The Mobilisation of Science', anonymous leading editorial, pp. 419-20, Nature, Vol. 95, 17 June 1915, p.419.

⁴² As well as Armstrong's letter of 21 June noted above, these included letters to the Times from Philip Magnus (12 June, p. 7); Professor J. Fleming (15 June, p.9); E.H. Griffiths of University College, Cardiff (16 June, p. 9); F. Creedy (19 June, p. 9); Patrick Geddes of University College, Dundee (24 June); Henry E. Roscoe (5 August); and from Armstrong again (9 August).

⁴³ Wells, letter to the Times, 22 June, 1915, p. 9.

⁴⁴ Ibid.

organization and advice which its status as the most prestigious scientific organization warranted; that there was therefore no effective national science policy; and that even the crucial area of war research was totally disorganised. Together all three amounted to the same basic complaint: scientists were not being allowed enough input into the prosecution of what they perceived as an essentially scientific war. On 1 July, Sir William Ramsay united these three strands of criticism in his address to the ninth Annual Meeting of the BSG on 'The National Organisation of Science'. He proposed a new officially recognised body, based on the nucleus of the Royal Society, which would both organise war research for the services and civilian industrial research, and would have a strong, formal voice in advising government and the framing of general science policy. He stressed that this new scheme was anchored in a tradition of arguments for greater control of policy by scientists stretching back to the 1870s and the Devonshire Commission's call for a State Science Council. This scheme was a new incarnation of the idea of the formalised National Scientific Advisory Council, with some executive authority attached to its conclusions, which had been the central theme of Edwardian public science. It was a mechanism for scientists not only to advise, but to frame policy. Its provenance was made clear before Ramsay even spoke at the Ninth Annual Meeting, when the Guild's President, Sir William Mather⁴⁵, spoke of Norman Lockyer as a 'prophet'.

Ramsay's new scheme had been formulated at his request by Lord Sydenham. He was a fellow Guild member, with an engineering background, who, as one-time secretary of the Committee of Imperial Defence, possessed a clear understanding of the machinery of government.⁴⁶ Ramsay posited that,

...the prime necessity at the present moment is a central body of scientific men, to whom the various Government Departments should be compelled to apply for advice and assistance. And more; it should be within the province of such a central organisation of science to propose new means of circumventing the enemy; it should have access to special information, and should be in close touch with all Departments of State, by having State officials as assessors at the meetings of the committees. [my emphasis] ⁴⁷

⁴⁵ The Right Hon. Sir William Mather, member of the Privy Council. Born in 1838 he was a Salford Ironmaster and member of the Manchester Literary and Philosophical Society and of the Institutions of Civil and Mechanical Engineers.

⁴⁶ Formerly Sir George Clarke, Secretary of the Committee of Imperial Defence 1904-7; President of the British Science Guild 1917-1920. Originally an army engineer, he had worked on fortifications and gunnery at the War Office and on naval projects at Woolwich. An economic historian, he was Governor of Victoria and Bombay.

⁴⁷ Ramsay, 'The National Organisation of Science', address to Ninth Annual Meeting of the British Science Guild, Journal of the British Science Guild, No.1, September 1915, p.13.

Small, confidential committees were no use, Ramsay stressed. This approach had itself blocked the 'formation of a strong, central body of organised science' since 'those who are serving on the committees feel that they would be guilty of a breach of trust' if they were to take part in such a move.⁴⁸ Ramsay suggested that the Government should follow the French lead and appoint large co-ordinated scientific committees under a central organisation. The central director would be a scientist, and all reports would go directly to Parliament. However, Ramsay perceived that such a degree of organisation, and of formalisation of the channels of scientific advice, was anathema to the traditional British methods of government and administration:

Just imagine the state of mind of the permanent officials of our Government Departments, were such a scheme forced upon them! It would disturb the even tenor of their way; they would be obliged to do something, instead of carefully classifying all proposals made to them, and putting each into its appropriate pigeonhole. But they have not yet realised that we are engaged in a war in which ancient practices may have to be superseded.⁴⁹

Ramsay's scheme saw the existing war organization of the Royal Society as the nucleus for the new body. He argued that it was, 'necessary to regularise the position and to extend the sphere of influence of such bodies. He stressed that this organisation needed to be formally recognised by Government as the national organising body for science, and the official channel of scientific advice. The aim was for:

The Royal Society to be formally constituted as an advisory body in regard to scientific questions arising out of the war, and requiring to be dealt with by His Majesty's Government.⁵⁰

The Society would establish a general Advisory Committee to which Government Departments would be 'directed' to apply for advice on : new weapons technologies; any other 'needs of war which call for scientific treatment or investigation'; and improved or new methods of manufacturing. Responsibility for selecting the sub-committees would be with the Royal Society Advisory Committee. These sub-committees would include members of other scientific societies, other experts, and representatives nominated by Departments of State, who would act as liaison officers with Government. Furthermore, the Advisory Committee, 'should also be empowered to make suggestions to the Head of any

⁴⁸ Ibid.

⁴⁹ Ibid., p. 14.

⁵⁰ Both, Ramsay, 'National Organisation...', op.cit., p. 15.

Department of State in regard to questions of applied science'. The Treasury, or the Department concerned, was then supposed to provide any funds which the Royal Society might deem necessary for special experiments.⁵¹

Sydenham had envisaged his scheme being a temporary arrangement for the duration of the war. Ramsay concluded his address hoping that it might mark a permanent formalisation of the relationship of experts and government. His reasons for arguing thus demonstrate the militant nationalist tone of the rhetoric of wartime public science, a leftover from Edwardian themes:

But is it too much to hope that if and when peace comes, the organisation would not be allowed to lapse? This will not be the last war; we have learned, in the crucible of fire, that we must be prepared. Nor is what we term 'war' what is most to be dreaded. It is the insidious advance by fair means and foul means of our enemies the Germans to obtain a monopoly of all fields of human endeavour.⁵²

At the BSG meeting, Mather proposed a vote of thanks and agreed wholeheartedly with Ramsay's revised scheme. Seconding this, the former Royal Society President, Sir Archibald Geikie, commented that,

If there is to be some central committee dealing with scientific matters, I am sure there could be no more efficient centre than the council of the Royal Society.⁵³

A resolution on Ramsay's plan was suggested by Ronald Ross, and the vote was passed unanimously.

An outline of this scheme was sent to the Prime Minister (Asquith), in a letter from the British Science Guild President, Sir William Mather, on 3 July. Here he stressed that the Chairman of the putative Royal Society Advisory Committee should enjoy direct contact with any Government department, informing them of conclusions or advice on any scientific question. Mather re-emphasised the point that the new body must be recognised as the formal and authoritative voice of science in policy-questions:

such communications must be considered by the responsible Head of the Department concerned as coming from a body charged by Government with special functions, and regarded as speaking with authority.⁵⁴

⁵¹ *Ibid.*

⁵² *Ibid.*, p.15-16.

⁵³ 'Report of Ninth Annual Meeting', p.3, in *Journal of the British Science Guild*. No. 1, September 1915, pp. 3-10.

⁵⁴ 'The Mobilisation of Science', letter from Mather to P.M., 3 July 1915, in *Journal of the British Science Guild* No. 2, January 1916, pp.2-3.

However, it appears that the controlling faction of the Royal Society Council was not prepared for the Society to take on the central control of general science policy. They were willing to advise the government via their war committees, but preferred that the organising body for science should be a new government body, though made up of eminent fellows. However, though the Royal Society did not want to be the new controlling body, it still wanted an official relationship with it. Negotiations had been in progress during June between Sir Amherst Selby-Bigge, Permanent Secretary to the Board of Education and Arthur Schuster, Secretary of the Royal Society⁵⁵. Selby-Bigge had gathered from these informal contacts that, 'it would go a long way to keep the Royal Society in good temper, if they were given initiatory functions'.⁵⁶ Thus when the final draft of the Government's scheme was published as a White Paper on 23 July under Arthur Henderson, who had succeeded Pease as President of the Board of Education when the Asquith Government was replaced by the Coalition in June, it contained a special clause codifying the relations of the Royal Society with the new Advisory Council on Scientific and Industrial Research (ACSIR):

It is proposed to ask the Royal Society and the principal scientific and professional associations, societies and institutes to undertake the function of initiating proposals for the consideration of the Advisory Council, and a regular procedure for inviting and collecting proposals will be established.⁵⁷

The functions of the ACSIR were now delineated in more detail than in Pease's original May announcement. A Committee of the Privy Council for Scientific and Industrial Research was established with responsibility for all new expenditure on research. The Committee was to be made up of The Lord President (chairman), the Chancellor of the Exchequer, The Secretary for Scotland, the Chief Secretary for Ireland, and the Presidents of the Boards of Education and Trade, plus any other Ministers and members of the Privy Council as the Committee might find necessary. The first such members were Lord Haldane, and Pease and Arthur H.D. Acland (both former Presidents of the Board of Education).⁵⁸ Since the Lord President was, at this time, also a member of the Lords, the President of the

⁵⁵ Sir Arthur Schuster (1851-1934), FRS, physicist. Worked largely on optics. Hon. Prof. of Physics at Manchester. One of the two Secretaries of the Royal Society since 1912 (with W.B. Hardy from 1915).

⁵⁶ Quoted from Varcoe, *op.cit.*, p. 206.

⁵⁷ 'Government Scheme for the Organisation of Scientific and Industrial Research', Cd. 8005, reprinted in *Nature*, Vol. 95, pp. 604-5.

⁵⁸ *Ibid.*, p.604. In May 1916 the Colonial Secretary was added. In September 1916 Arthur Henderson, and in February 1917 the Marquess of Crewe were also added.

Board of Education was to answer to the Commons on expenditure. He was vice-chairman of the Committee and his department was also to provide offices and administrative support. The small ACSIR was attached to this Committee. It was to be 'composed mainly of eminent scientific men and men actually engaged in industries dependent upon scientific research'.⁵⁹ Its primary functions were to advise the Committee of Council on proposals for

...initiating specific researches....for establishing or developing special institutions or departments of existing institutions for the scientific study of problems affecting particular industries and trades....the establishment and award of research studentships and fellowships.⁶⁰

The ACSIR was also to advise the departments concerned with education, on methods to increase the supply of competent scientific researchers and, importantly, was also empowered to initiate research proposals itself. Its recommendations would represent 'progressive instalments of a considered programme and policy'.⁶¹ As Peter Alter has noted, quoting R.L. Morant:

This comprehensive transfer of authority was based on the 'modern experience' that 'a properly composed body...can be allowed a sufficiently free hand by Parliament to be given the right to disburse the grant-in-aid, Parliament being content with no more than a Ministerial mouthpiece'.⁶²

The first members of the ACSIR represented a perhaps unsurprisingly conservative choice by Selby-Bigge (the Secretary to the Committee of the Privy Council) and Frank Heath ⁶³ (Secretary of the ACSIR) at the Board of Education in consultation with Sir William Crookes, the Royal Society President. They were: the physicists Lord Rayleigh and Professor J.A. McClelland; the chemists Raphael Meldola, Sir George Beilby and Sir Richard Threlfall; and the engineers Professor Bertram Hopkinson and Mr. William Duddell. All were Fellows of the Royal Society.⁶⁴ The average age was sixty.⁶⁵ The

⁵⁹ Cd. 8005, *op.cit.*, p. 604.

⁶⁰ *Ibid.*

⁶¹ *Ibid.*, p. 605.

⁶² Alter, *op.cit.*, p. 208. R.L. Morant to Selby-Bigge, 21 June 1915, Ed. 24/1576, PRO.

⁶³ Henry Frank Heath (1869-1946), academic and scientific administrator, Professor of English, Bedford College, 1890-96; Academic Registrar of London University, 1901-03; Director of Special Inquiries and Reports, Board of Education, 1903-16; in charge of Universities Branch, 1910-16; Member of the Treasury Advisory Committee on University and University College Grants, 1909-11; First Secretary, ACSIR, 1915-27. KCB, 1917. (DNB)

⁶⁴ Rayleigh was the most distinguished contemporary mathematician and physicist: co-discoverer with Ramsay of argon; from 1873-84 Cavendish Professor of Experimental Physics at Cambridge. From 1884-1895, Secretary of the Royal Society. He became President of the Executive Committee of the National Physical Laboratory in 1898, of the Royal Society in 1905 and Chancellor of Cambridge University in 1908. Beilby, a graduate of Edinburgh University, was an industrial chemist and Chairman of the Royal Technical College, Glasgow; Duddell a consulting engineer, a past President of the Institution of Electrical Engineers, and a member of the Admiralty Board of Invention and Research; McClelland held the Chair of Experimental Physics at University College, Dublin; Hopkinson was Professor of Applied Mechanics at Cambridge; Meldola was at Finsbury Technical College, had been President of the Chemical Society in 1907, and was expert in the chemistry of dyes; Threlfall was an engineer and manufacturing chemist.

administrative chairman of the ACSIR was Sir William McCormick, then chairman of the Treasury Advisory Committee on University and University College Grants.⁶⁵ The ACSIR had £25,000 to spend in the first year and £40,000 in the second. It first met on 17 August 1915.

The Government scheme was at first perceived as something of a triumph by those public scientists of the BSG/Nature circle, since it seemed that the precedent had now been set that scientists could independently control areas of policy related to science. In fact the public scientists allowed themselves a moment of self-congratulation. Nature proclaimed that the ACSIR represented the realisation of what Haldane as BSG President in 1905 had called a scientific corps: eminent scientists, unfettered by bureaucrats, making science policy.

The British Science Guild may justly claim some credit for securing the State assistance for industrial and scientific research now provided for by the Government. For the ten years of its existence it has persistently pointed out that our competitors have brought all the products of science into the contest they have waged against us; and it has urged the adoption of similar methods in our national affairs and manufactures....A public movement was required to direct the attention of the public in general, and the Government and political parties in particular, to the value of the great resources of science in the development of the kingdom; and this movement took shape in the British Science Guild....We regard the Government scheme as a measure of acknowledgement of the principles of State responsibility and guidance advocated by the Guild...⁶⁷

Even the Government seemed to acknowledge that the pressure of public science arguments had in some ways informed the setting up of the new scheme. The first report of the Committee of Council noted that:

...the action of the government in setting up the new machinery for the encouragement of research was accompanied, if not instigated by, vigorous discussion and debate in the public press and the learned societies.⁶⁸

However, the establishment of the ACSIR had not satisfied all the demands of BSG/Nature public science. The various schemes for the central control of science policy

⁶⁵ The engineer and founder of a marine steam turbine manufacturing firm, Sir Charles A. Parsons was appointed on the retirement of Hopkinson and Professor J.F. Thorpe, Professor of Organic Chemistry at Imperial College, on the death of Meldola.

⁶⁶ William Symington (later Sir William) McCormick (1869-1930), scholar and administrator. Professor of English Literature at University College, Dundee, 1890; first Secretary of the Carnegie Trust for Scotland, 1901; Chairman of University Grants Committee from 1919. Knighted 1911, FRS, 1928 (DNB)

⁶⁷ 'The Promotion of Research by the State', pp.619-20, Nature, Vol.95, 5 August 1915, p.620.

⁶⁸ Report of the Committee of the Privy Council for Scientific and Industrial Research for the year 1915-16, Cd. 8336, 1916, p.19.

which had come from the scientific community were meant to encompass not only industrial research, but also military and naval research, as we noted earlier. In a total war when, as the scientists had been arguing for thirty years, the whole of the economic resources of the country needed to be mobilised as part of the war effort, it is difficult, and perhaps in any case erroneous, to attempt to separate so-called civil and military science. The Department of Scientific and Industrial Research (DSIR) which was to succeed the Committee of the Privy Council in 1916, investigated problems, through its various Research Associations and Boards, and the National Physical Laboratory (NPL) which it took over in 1918, which had a bearing on Britain's overall fighting capacity.⁶⁹ However, the ACSIR was nominally set up to investigate problems of civil industrial research, with the emphasis on post-war competition with Germany, as well as wartime uses. The White Paper had explicitly stated this:

The present scheme is designed to establish a permanent organisation for the promotion of industrial and scientific research. It is in no way intended that it should replace or interfere with the arrangements which have been or may be made by the War Office or Admiralty or Ministry of Munitions to obtain scientific advice and investigation in connection with the provision of munitions of war. It is, of course, obvious that at the present moment it is essential that the War Office, the Admiralty, and the Ministry of Munitions should continue to make their own direct arrangements with scientific men and institutions with the least possible delay.⁷⁰ (*my emphasis*).

This clear statement that the new organisation was not part of the specifically wartime machinery, and was not explicitly designed to cater to war needs, seems to have been inserted at the suggestion of Sir Robert Morant, to whom Selby-Bigge had referred an earlier draft of the scheme. Morant perhaps had in mind that if war uses of science were explicitly included there would be much disapproval from the service departments, which jealously guarded the autonomy of their own research and development arrangements.⁷¹

Thus while Nature welcomed the developments in the organisation of industrial research, it was not long before it was renewing complaints that there was no similar central

⁶⁹ For details see MacLeods, 'The Social Relations of Science and Technology...', *op.cit.*, p. 315; On the work of the NPL see, for instance, Eric Hutchinson, 'Government Laboratories and the Influence of Organized Scientists', *Science Studies*, Vol. 1 (1971), pp. 331-56, especially, pp. 332-4.

⁷⁰ Cd. 8005, *op.cit.*, p. 604.

⁷¹ Morant wrote that if such a disclaimer was not inserted, 'your scheme will be taken as applying in part at least to these war needs, and it seems clear that, for those purposes, your scheme would be met with a storm of disapproval', Morant to Selby-Bigge, 21 June 1915, Ed. 24/1576, PRO. Cited here from MacLeod, 'The Origins of the DSIR...', *op.cit.*, p. 34.

organisation of military and naval research. There were, of course, the sectional committees of the Royal Society, which (as will be further explored in a following chapter) now had representatives of relevant government departments sitting as members, thus forming an interface with government. In addition, on 8 July the Chemical Society had taken steps of its own to form a consultative council with representatives from the Biochemical Society, the Faraday Society, the Institute of Chemistry, the Institute of Metals, the Institution of Mining and Metallurgy, the Pharmaceutical Society, the Physical Society, the Royal Agricultural Society, the Society of Dyers and Colourists, the Society of Public Analysts, and the Society of the Chemical Industry. This body was to vet the numerous suggestions for warlike inventions sent in by scientists. There was also a General Committee formed:

...to deliberate on all questions of general policy with reference, not merely to questions directly relating to the war, but also all matters on which it is desirable to have the opinion of a body thoroughly representative of every department of chemical science.⁷²

The Physical Society had also established a committee to consider suggestions and inventions, and like the Royal and Chemical Societies, it had begun to compile a list of members' specialisms.⁷³

However, there were no definite relations between these bodies, and no unifying organisation. Nature commented that,

Unless there is close cooperation between the committees of the various scientific societies it is difficult to see how overlapping will be prevented or how combined expert knowledge can be concentrated upon physical, chemical and engineering problems requiring early and practical solution.⁷⁴

The writer of this article was hopeful that the recently announced Munitions Invention Department which Lloyd George was establishing at the Ministry of Munitions, and which was to take over all Army related projects from the Admiralty, would prove to be a step, 'in the direction of the establishment of the proposed central committee or bureau to direct scientific and inventive energy into channels of effective work'.⁷⁵ The writer hoped that such

⁷² 'Science Committees and War Problems', unsigned article (possibly by the editor, Dr. Howard S. Wilson, or possibly by Richard Gregory), in Journal of the British Science Guild, No.3, June 1916, pp.8-10; 10.

⁷³ See 'Science and Munitions of War', unsigned article, Nature, Vol.95, 22 July 1915, pp.562-4.

⁷⁴ Ibid., p. 562.

⁷⁵ Ibid., p. 563.

a new official body would, ideally, ultimately coordinate the work of the Royal Society and the learned societies. He argued that,

When such an organisation has been established, it should not be in separate connection with the Admiralty, War Office, Ministry of Munitions, and Board of Trade, but with a bureau to which scientific suggestions or inventions would be addressed, with the sure and certain knowledge that they would be submitted to expert trial and judgement.⁷⁶

The writer was not clear whether the Admiralty Board of Invention and Research (established under the Chairmanship of the ex-First Sea Lord, Admiral Lord Fisher on 5 July) was to be this central body, or whether, 'further committees are to be established by other Government departments concerned with scientific problems of the war and munitions'.⁷⁷ What he was clear about was that,

Good organisation demands concentration of effort upon common problems; and that end will not be reached by separate departments and separate scientific societies appointing their own committees and panels of consultants for independent work and advice. Co-ordination might be attained by the constitution of a grand committee on which each department and each scientific society concerning itself with national work would be represented, or a sort of official exchange might be established to which all suggestions or needs would be communicated, either to be dealt with by a small scientific staff attached to it or distributed to expert advisers for judgement. Only by linking up the various departments with one another and with scientific societies somewhat in this fashion can overlapping be avoided and the fullest advantage be secured most expeditiously from the services which men of science are prepared to place at the country's disposal.⁷⁸

It is a mark of how seriously scientists saw the war as an opportunity to formalise their relations with government that the author of this article went on to argue for payment for the kind of organised advice he had suggested.⁷⁹

As it turned out, inter-service and inter-departmental rivalries prevented the formation of any central organising body on war research. The BIR sifted suggested inventions for the Navy, and the MID for land warfare, while both pursued their own separate contacts with government departments and with the Allies.⁸⁰ In fact, even the MID

⁷⁶ Ibid.

⁷⁷ Ibid.

⁷⁸ Ibid.

⁷⁹ Ibid.

⁸⁰ The Central Committee of the Board of Invention and Research consisted of Lord (Admiral Sir John) Fisher, Sir J.J. Thomson, Sir C.A Parsons and Dr. George T. Beilby. This committee was supported by a panel of physicists, chemists and engineers including William Bragg, the crystallographer; Bertram Hopkinson, Professor of Mechanical Engineering at Cambridge; Sir Oliver Lodge; and Ernest Rutherford. On this see MacLeod and Andrews, 'Scientific Advice in the

did not control research into explosives, chemical weapons and aspects of trench warfare. These were in the hands of other sections of the Ministry of Munitions. On the creation of the Ministry, the High Explosives Committee, which had been established at the Board of Trade in late 1914 and was chaired by Lord Moulton,⁸¹ was transferred to the new Ministry and enlarged into an Explosives Department.⁸² This body remained under Moulton's control and conducted explosives research via an advisory panel of scientists under R. C. Farmer, late of the Ordnance Board at the Woolwich Arsenal.⁸³ Research into offensive chemical warfare, mortars, grenades, bombs and other problems of trench warfare was controlled by the Ministry's Trench Warfare Department.⁸⁴ This was created in June 1915 by Christopher Addison, on the instructions of Kitchener, and put under the charge of Alexander Roger, a War Office civil servant with an accountancy background. He was aided by a Commercial Advisory and a Scientific Advisory Committee. Most of the scientists were already members of the Royal Society War Committee, but Professors H.B. Baker and J.F. Thorpe of Imperial College, the fuel expert Sir Boverton Redwood and the physiologist W.B. Hardy were also included.⁸⁵ As Michael Pattison has argued:

The organization of inventions research in Britain which emerged [in 1915]...was extremely complex and fragmented. In total, nine government departments held direct responsibility for the investigation of inventions. Concern was expressed in some quarters about the lack of formal co-ordination between the various scientific departments servicing the military, particularly when compared with the highly centralized organizations which emerged in France, Germany, Italy and the United States.⁸⁶

War at Sea...', *op.cit.* The Munitions Invention Department had E.W. Moir as Comptroller, assisted by the scientific experts: Col. Goold Adams, Horace Darwin, Mr. Duckham, W. Duddell, Dr. S.Z. de Ferranti, R. Glazebrook, Sir R. Hadfield, J.S. Haldane, Col. N.B. Heffernan, Sir A. Kennedy, F.W. Lanchester, Dr. A.P. Laurie, Prof. Vivian B. Lewes, M. Longridge, W.H. Maw, Sir Hiram Maxim, Capt. Moore, Sir H. Norman, F.G. Ogilvie, Maj. Gen. G.K. Scott-Moncrief, W. Stokes, J. Swinburne, Sir J.J. Thomson, A.W. Walter and C.J.R. Wilson. From 'Science Committees and War Problems', *Journal of the British Science Guild*, No. 3, June 1916, p.9. See also Pattison *op.cit.*

⁸¹ The Committee was to consider methods of securing adequate supplies of high explosives. See N.B. Dearle, *Dictionary of Official War Time Organisations*, (London, OUP, 1928), p. 260. The committee may have been appointed by Haldane as part of the work of his Chemical Products Committee: a mixed body of civil servants, industrialists and chemists (Beilby, Meldola and Perkin) to advise on the best means of securing supplies of chemical products and dyestuffs, previously imported from enemy countries. The Committee appointed various sub-committees including Moulton's Dye-Stuffs Committee which recommended State support for the dye industry and resulted in the setting up of British Dyes Ltd. See Dearle, *op.cit.*, p. 249-50 and Hartcup, *op.cit.*, p. 44-5. Moulton was a Lord of Appeal and explosives patent lawyer. He had been a senior wrangler at Cambridge and his research on electricity had won him a Fellowship of the Royal Society. He had also been a Liberal M.P., and was chairman of the Medical Research Committee.

⁸² See Dearle, *op.cit.*, p.260; Hartcup, *op.cit.*, p. 44-5; Pattison, *op.cit.*, p. 529.

⁸³ See Hartcup, *Ibid.*, p. 45.

⁸⁴ See Pattison, *Ibid.*

⁸⁵ See Hartcup, *op.cit.*, p. 25.

⁸⁶ Pattison *op.cit.*, p. 530.

Concern from inside the machinery of government came particularly from Sir Henry Norman, M.P. then the MID's attache to the French Ministry of Inventions. He complained to the Cabinet that there was much duplication of work through lack of contacts and co-ordination. Just like the public scientists he commented that: 'We have in abundance knowledge and skill unsurpassed anywhere. All we lack is the centralization of knowledge and directive control'.⁸⁷ Yet, again like the scientists, his criticisms in this area went unheeded.

This failure to organise centrally warlike research perhaps tells us something very interesting about the general relationship of the British State with outside expertise in this period. Public, as well as scientific, pressure had forced the government to do something about industrial research, but the resulting scheme, as MacLeod has demonstrated, was a modification of a plan which had been taking shape in the corridors of Whitehall for many years.⁸⁸ Here, political will was added to outside pressure. The case of warlike research was very different. The necessary secrecy made the services and departments of government concerned even more resistant than usual to pooling their organisation. If the organisation of industrial research represented, as Morant had put it, the 'modern experience', then the informal relationships between the various bodies charged with warlike research represented a more traditional approach to the use of experts in government. The main linkages between the various bodies was the fact that many of the scientists were influential members of the Royal Society, and often of its Council in the form of the War Committee. We have already noted that elements of the Royal Society were resistant to formalisation, and keen to preserve the old informal links with government. Thus the non-organisation of warlike research must have suited both parties, (the more traditionally independent elements of both the State -in the form of the service related departments-and the Royal Society), rather well. Efforts were made after the war to co-ordinate research for the services, but these foundered in the late 1920s largely because of inter-service rivalries.⁸⁹

⁸⁷ Ibid.

⁸⁸ See MacLeod, 'The Origins of the DSIR...', op.cit.

⁸⁹ In 1920 an attempt was made to unify research for the services under the DSIR. Three Coordinating Boards (one for Physics, Chemistry and Engineering) were added to the existing Radio Research Board, and Heath successfully recruited Henry Tizard to be in overall control as DSIR Assistant Secretary. The impetus for this move seems to have been the Cabinet's desire to save money. After completing work on electromagnetic 'death rays', the use of selenium cells in detecting x-rays, air-craft silencing and metal fatigue, the Boards were dissolved in 1929. Only the Radio Research Board, which had done important pioneering work on the development of radar, survived. The major

By October 1915 the public scientists had also begun to have grave misgivings about what they had viewed as their one success, the organisation of industrial research itself. Concern centred on the role of the Advisory Council, and its administrative direction by the Board of Education. This dissatisfaction led to their rhetoric becoming markedly anti-democratic. Democracy was presented as meaning government by lawyer-politicians elected for their persuasive oratory, rather than men who knew how to govern the nation efficiently. Such leaders could not be trusted with any area of policy-making, all of which needed a logical scientific approach. Scientists now began to stress the special applicability of the scientific method to all policy-making. In so doing they under-scored their claims for control of science policy. But to them science policy had never been narrowly defined but had meant policy with a scientific content. This ultimate aim now became clearer with arguments about the failures of democracy and the 'transferability' of scientific method to social problems.⁹⁰

Fleming's over-riding concern in his lecture at University College London on 6 October was to argue that failure to acknowledge the importance of science as a resource in national affairs was, 'more serious than a mere national trait or idiosyncrasy'. Rather it was a function of democratic or representative government. The democratic politician was a fluent orator, skilled in managing public assemblies, but cared little for the facts, whereas the scientist's whole object was 'the discovery of the truth, and not its obscuration'.⁹¹ Richard Gregory took up this theme more vehemently on 21 October in the first of his own editorials in Nature, entitled 'Science and the State'.⁹² The bone of contention was the role of the Advisory Council in a Board of Education run by generalists. For instance, the Secretary of the Committee of the Privy Council (which controlled the monies for new

problems seem to have been the difficulty of coordinating work in an ever-widening field of applied defence research (both in terms of the subject area and the number of institutions), the politically controversial nature of funding for defence research, and, perhaps most importantly, the practical difficulties of overcoming the reluctance of the services to pool knowledge and perhaps also to submit to civilian central direction. Very little has been written on the Boards or how they fit into the wider picture of the State's (or scientists') changing view of the organisation of research, but for brief discussions see R.W. Clark, Tizard, (London, Methuen, 1965), pp. 55-81; Hartcup, op.cit., p. 194; and R.V. Jones, 'Scientists and Statesmen: the Example of Henry Tizard'. Minerva, Vol.IV, (1966), pp. 202-14.

⁹⁰ See Yeo, op.cit (note 4), especially pp. 282-7.

⁹¹ Fleming, op.cit., (note 12), p. 181.

⁹² Richard Gregory, 'Science in National Affairs', unsigned leading editorial, Nature, Vol.96, 21 October 1915, pp.195-7; The information that this was indeed by Gregory comes not only from the style and subject matter, but also from Armytage, op.cit., p. 68. Gregory did not officially take over the editorship of Nature until 1919, when he replaced Lockyer (as he had succeeded him as formal director of the BSG in 1918). But he had been taking an increasingly large share of the editorial role, as the ageing Lockyer's assistant, for some years.

research), Sir Amherst Selby-Bigge, was described as knowing 'no more of practical science and technology than a schoolboy', and Frank Heath, the Secretary of the ACSIR, had interests 'similarly in other fields than those of science'.⁹³ More damningly still, Gregory condemned the ethos of the whole of British government and administration:

The belief that the expert -whether scientific or industrial- has to be controlled or guided by permanent officials having no special knowledge of the particular subject in hand is typical of our executive system. While such a state of things exists, most of the advantages of enlisting men of science for national services must remain unfulfilled. The various scientific committees which have been appointed recently have...been able to give valuable aid...but...would be far more effective if the chiefs of the departments with which they are associated possessed a practical knowledge of scientific work and methods. Without such experience the executive is at the mercy of every assertive paradoxer and cannot discriminate between impractical devices and the judgement of science upon them...[we must have] scientific men among the permanent officials...⁹⁴

A double-argument was used for the utilisation of scientific method in the conduct of national affairs. Firstly science was factual, and not interested only in rhetoric (!), unlike the politician:

While success in science is measured solely by discovery of facts or relationships, in politics...it is secured by fluent speech and facile pen....Power, as regards government of the affairs of the nation, does not come from knowledge, but from dialectics: it is the lawyer who rules, with mind obsessed by the virtues of precedent and expediency, and to him men of science...are but hewers of wood and drawers of water.

Under a democratic constitution it is perhaps too much to expect that Parliament will pay much attention to scientific men or methods...⁹⁵

Secondly ethical claims were made for the very process of scientific study itself:

Science is not only able to increase the comfort of life and add to material welfare, but also to inspire the highest ethical thought and action; and a prominent place should be given to it in all stages of educational work as much on account of its ennobling influence as because it is a creator of riches.⁹⁶

⁹³ Gregory, *op.cit.*, p.195.

⁹⁴ *Ibid.*

⁹⁵ *Ibid.*

⁹⁶ *Ibid.*, p.197. Gregory was to use very similar language in his book *Discovery or the Spirit and Service of Science*, published by Macmillan (*Nature's* publisher) in July or August of 1916. Here he wrote 'We seek to justify the claim of science to be an ennobling influence as well as a creator of riches; and therefore as much importance is attached to motive and method as to discovery and industrial development, however marvellous or valuable these may be....For science is not to be measured by practical service alone, though it may contribute to material prosperity: it is an intellectual outlook, a standard of truth and a gospel of light.' He claimed that the study of science taught 'regard for veracity, patience, logical thought, responsibility, discipline and original work.' Cited from Armytage, *op.cit.*, pp. 69-70.

The point here was clear: scientists should be in positions of authority able to frame policy because scientific method not only gave greater accuracy by inductively addressing the facts, but it also inculcated a higher moral outlook. Scientists made efficient and moral leaders. Here we clearly see the extent of the scientists' ambitions: they wanted authority in all aspects of national affairs, not just in questions relating to a narrowly defined idea of science policy. As Gregory concluded his first editorial:

Vox populi, vox Dei, may be a sound democratic principle for political platforms, but it stands for nothing in science. The men who have advanced the human race throughout the ages are they who have stood for individuality as against the voice of the crowd. We need such leaders now, men who will guide the people instead of waiting for a mandate from them before embarking upon any enterprise; and we need, above all, that the chief officials of departments of State should have had a training in scientific methods before being entrusted with the control of national affairs. While indifference to these things is the distinguishing characteristic of our statesmen and administrative officers, it is useless to expect that the nation's business will be conducted efficiently or its scientific forces be organised on the large scale which modern conditions demand.⁹⁷

Ramsay continued this theme in December 1915, arguing in Nature that: 'serious political changes are imperative in this country. The practical men must obtain control; they must be assisted by the highest scientific advice procurable'.⁹⁸

This kind of technocratic, anti-democratic argument was also appearing in the pages of Science Progress. Here it was perhaps even more vehemently expressed by the redoubtable editor, Ronald Ross. The July 1915 issue had contained an article by Ross with the incontrovertible title of 'A Hoped for Revolution in Britain':

We suspect that the war will be followed by a revolution in England, and one which will be directed principally against the sort of people who now rule us and whose frequent neglect of the advice of experts and of the evident facts of the case has been largely responsible for the war....The captain of a ship who persists in a certain course in spite of the advice of his pilot and consequently runs his vessel upon the rocks is deprived of his certificate and dismissed from his appointment; but politicians who run their country and the world upon the rocks of war are still allowed to govern, to advise, talk platitudes, and to draw their salaries! We want new captains for our political navy.⁹⁹

In April 1916 Ross wrote in an editorial note that

⁹⁷ Ibid., p. 197.

⁹⁸ Ramsay, 'The Scientific Organisation of Industries', Nature, Vol. 96, 30 December 1915, pp.480-1; 481. Original italics.

⁹⁹ 'A Hoped for Revolution in Britain', editorial article by Ross, in 'Notes', section of Science Progress, No. 37, July 1915, pp.151-3; 152-3.

The principal complaint against party politics is that they have destroyed ...[the ideal of meritocratic government] by substituting an oligarchic wire-pulled machine for government by the best people. Britain is ruled today by carefully organised, subsidised, paid, and, we believe, wholly vicious party caucuses which return to Parliament persons of their own order, and thus exclude the best brains in the country. Our argument is that a man who consents to belong to a political party thereby abdicates his right of free judgement, and at the same time shows that he is not intellectually or morally a man fit to rule a great Empire.¹⁰⁰

Ross had returned to similar themes in July 1916 in an editorial article entitled 'Our Duty':

...why then do we not use...intelligence for our own government? Cannot men who made the great ships that move upon the waters and in the air, the great engines that labour on the land, and the great instruments that enable the mind to measure the heavens - can we not use these powers to prevent such disasters as we are now suffering from, by constructing an equally efficient engine of government? Truly we can. But only by one method. By using the calculation, judgement, forethought and invention which men of science and inventors have employed in the cases mentioned. To do this....Let us cast behind us our sects, our party politics, our dogmas and our lies, and fling our broken idols on the rubbish heap.¹⁰¹

Neither was this kind of argument confined to the columns of Nature and Science Progress. It was becoming an increasingly common feature of the public pronouncements of scientists in general. For instance, Edward Bagnall Poulton, the Hope Professor of Zoology at Oxford, and President of the Linnean Society, propounded similar assertions in his Romanes Lecture at the Oxford University Museum on 7 December 1915. He put all the failures of the war down to the neglect of science and the predominance in government 'of the spirit that is most antagonistic to science - the spirit of the advocate':

What a grave responsibility has been incurred by the Government in deciding...vital issues without scientific evidence, and in clinging to their mistake in spite of the efforts of those who know. Untold thousands of lives and an ever-increasing volume of human misery are a terrible punishment for the neglect of science....What we really need to end the war is knowledge and firm action based on it. As it is, with its slipshod ways of conducting war and neglect of scientific authority, our own Government has done very much to help Germany out...¹⁰²

¹⁰⁰ Ronald Ross, 'Party Impolitics', Science Progress, No. 40, April 1916, pp.664-5; 665. See also 'The Organisation of Science' letter to Nature from Ross, 3 January 1916, in Vol. 96 13 January 1916, pp.536-7; and 'The World's Misrulers' and 'The Reform of Democracy', in Science Progress Vol.12, No. 46 (October 1917), pp.295-301 and 301-309 respectively.

¹⁰¹ Ross, 'Our Duty', Science Progress, Vol. 11, No. 41 July 1916, pp.133-6; 136.

¹⁰² E.B Poulton, Science and the Great War, (Oxford, Clarendon Press, 1915), p. 4, and pp..22-3 and 31. See also his Third Galton lecture to the Eugenics Education Society, 16 February 1916, entitled 'Science and Government', reported in Nature Vol. 96, 24 February 1916, pp.717-8: 'The next general election will reveal a revolution in the political thought of the country, and the urgent necessity for the society will be to fight alongside the other sciences and the great business interests of the country, ensuring that scientific men and business men shall have weight in our future form of Government' (p.717).

However, although the radical political rhetoric had by now become the dominant voice of the scientific community, siren voices did cry out against it. The physiologist W. M. Bayliss¹⁰³ wrote to Nature on 23 October criticising the above quoted technocratic, anti-democratic editorial of 21 October:

Whatever may be our views as to a democratic constitution, it must be remembered that it exists, and nothing but obstruction is likely to result from throwing stones at it. It is to be feared that what feeling of opposition to science is present in the democratic mind is largely due to the arrogance apt to be shown by men of science. Skill and success in a particular branch of science alone do not warrant the demand that their possessor shall be regarded as capable of expressing opinions of value on any and all questions of public importance.

However, Bayliss' disagreement was over tactics for gaining influence not over the radical political aim itself:

May I suggest that a more conciliatory attitude than that too often assumed with respect to what seem to be well-meant efforts on the part of Government Departments would be more to our interest and for the benefit of the nation? There is no doubt, a very great deal yet to be done in connection with the position of science in the State. But we may do much in assisting those who are inclined to look with favour on our desires and demands, although it may be that too many of the positions of authority are filled by men lacking in appreciation of the meaning and aims of science. We have an opportunity of showing our value to the nation, and, if we use it well, greater duties and responsibilities will follow.¹⁰⁴

Gregory, as editor, took the unusual step of printing a reply to this letter, underneath it in the same issue. Here, he argued that he was not willing to concede the principle that only non-scientists could be in control of scientific departments or committees, and ended by re-stating that:

Science has too long been content to occupy a subordinate position in the national executive; the main object of our article was to assert its claims to a higher place.¹⁰⁵

¹⁰³ William Maddock Bayliss (1860-1924) B.Sc. 1882 University College London. F.R.S. 1903. Knighted 1922. Professor of General Physiology, University College, London, 1912-24.

¹⁰⁴ Letter from Professor William Maddock Bayliss to Nature 23 October 1915, published as 'Science in National Affairs', Nature, Vol. 96, 4 November 1915, p. 260-1. W.M. Bayliss FRS, (1860-1924): born Wolverhampton, son of wealthy iron manufacturer. Studied science at University College London under Ray Lankester and Burdon Sanderson, obtaining his B.Sc. in 1883 with a scholarship in Zoology. Obtained a first in Physiology at Oxford in 1888. Returned to UCL and worked with E.H. Starling, eventually being elected Professor of General Physiology there in 1912. He was an active Liberal, and member of the Royal society Council, 1913-15. See W.J. O'Connor, British Physiologists, 1885-1914: a Biographical Dictionary, (Manchester, Manchester University Press, 1991), pp. 135-9.)

¹⁰⁵ Gregory, 'Reply of the Editor', Ibid., p. 261.

Interestingly, Bayliss was a member of the Council of the Royal Society. In his letter he may have been putting forward the view of the Society that given the traditional reluctance of government to delegate authority in any formal way to outside experts, the informal methods of the Society might be more productive of influence.

By the end of 1915, the Royal Society model for the organization of science and scientific control of policy-making was firmly in place. Control was not to be given to a voluntary collective body of scientists, which would be somehow attached to the machinery of government. There would be no national science council as the public scientists has envisaged. Instead a variant of the German method of State organized science had been adopted. This way, the Royal Society publicly retained its autonomy and the objective nature of scientific knowledge was in no danger of being compromised. At the same time the Society exercised effective control of science policy through those of its eminent Fellows who made up the ACSIR (whose membership was still subject to the approval of the Royal Society President) and the various war research bodies for civilian scientists. The Society did not want an official policy-making role. It preferred a public advisory role, but with real, though informally channelled, power behind the scenes. With this model now ensconced, all the Nature/BSG circle could do was to suggest refinements to it which upgraded the role of the scientist in policy. Thus in his 1915 Presidential Address on 30 November, Sir William Crookes¹⁰⁶ revived the well-worn theme of the separate Ministry for Science, with a greater input for scientists. Crookes suggested that a Minister of Science, with Cabinet rank, should be appointed. But scientists would not be subordinated to generalists. The new Minister should have a board of advisers, and should himself be an eminent scientist: 'Power of organisation and general business abilities should be regarded as essential secondary qualifications'. The Advisory Council and all scientific committees should be under the new Ministry.¹⁰⁷ This strategy was continued when, on 2 February 1916 a memorandum entitled 'The Neglect of Science: A Cause of Failures in War' and signed by thirty six university scientists and medical men (among them Armstrong, Crookes, Fleming,

¹⁰⁶ Sir William Crookes (1832-1919). Knighted 1897. O.M. (1910). Scientific journalist and professional expert, Crookes never held a permanent academic position, though he pursued his chemical work part-time in his own laboratory, and was elected President of the Royal Society in 1913. See Alter op.cit. pp. 234-5 and DNB Supplementary Volume 1912-21, pp.136-7.

¹⁰⁷ Crookes' speech was reported in 'Anniversary Meeting of the Royal Society', Nature, Vol. 96, 2 December 1915, pp.373-5; 375.

Griffiths, Poulton, Rayleigh, Ross, E. H. Starling, William Tilden, T.B. Wood), was published in the Times. It called for more science in education and the Civil Service examinations as a way of ensuring that science was properly valued in the community and that scientific methods were utilised in government in the future. Eventually, the Board of Trade was to be replaced by a 'Ministry of Science, Commerce and Industry, in full touch with the scientific knowledge of the moment'.¹⁰⁸

The new strategy was supported by Nature in an editorial on 10 February.¹⁰⁹ However, it was felt that there was no need for a new public science organisation to coordinate pressure on government. The British Science Guild offered itself as a rallying point:

The British Science Guild was founded to urge all responsible authorities to give science its rightful place in national affairs, and it has persistently put forward these claims for the past ten years or so.¹¹⁰

Instead of any new body Nature called on science to,

...exert its activities through the British Science Guild, instead of acting independently of the guild, and thus presenting a divided front to the forces to be overcome....science should speak with a collective authority, and demonstrate by the conduct of its own affairs that it is capable of organised action and clear leading.¹¹¹

Speaking at the tenth annual meeting of the Guild on 17 May, the President, Sir William Mather re-emphasised this theme:

There are at least a dozen different programmes before the public dealing with the mobilisation of Science, and the co-ordination of scientific effort. It is possible for the British Science Guild, I think, while taking note of all these efforts, to play a useful part in helping to bring them all together and to evolve a great national Council of Science, Industry and Education, to which the nation may look in peace and war for that guidance, the lack of which has been so greatly felt during recent years in our country.¹¹²

¹⁰⁸ 'The Neglect of Science: A Cause of Failures in War', Times, 2 February 1916, p. 10.

¹⁰⁹ This was a memorandum from a Committee of the Association of Public School Science Masters, again pointing out the general ignorance of science amongst politicians, civil servants and the public. It recommended more science in the Civil Service and Army examinations; the replacement of the Board of Trade with a Ministry of Science, Commerce and Industry 'in touch with the scientific knowledge of the moment'; that scientists be included on the Privy Council and play a large role in the service of the State. All this, it was characteristically claimed, was essential to the survival of Britain as a 'Great Power'. The Memorandum was published in many daily papers. See Nature, Vol. 96, 3 February 1916, p.640.

¹¹⁰ 'Defects and Remedies', unsigned leading editorial p. 644, Nature, Vol. 96, 10 February 1916, pp.643-4.

¹¹¹ Ibid, p.644.

¹¹² Mather, opening remarks to tenth annual meeting of the BSG, Journal of the British Science Guild, No. 3, June 1916, p.48.

But, as we noted, influence had already largely passed away from the Nature/BSG circle with its model of the national science council, towards the Royal Society. On 22 March the Royal Society formed a Conjoint Board of Scientific Societies. This sought to take over many of the activities of the BSG, and backed by the prestigious name of the Society it could accomplish the kind of organisation which the Guild had failed to do. It sought to coordinate the advice of academic scientists to government.¹¹³ From this point on the Guild became increasingly uncertain of its mission, and spent much of the 1920s in ultimately vain attempts to redefine itself and its role.

By November 1916, The Guild was arguing with the same voice as the Royal Society. It published a report (drawn up by its Science and the State and Technical Education Committees, and a special conference on the position of the Guild) making a plea for the establishment of a statutory Board or Ministry of Science and Industry. It was to have a permanent staff of scientists, and sweeping powers. The new Ministry would be the 'executive centre' of the committees formed by the Royal Society, the Chemical Society and various trade and educational associations. It would also organise industrial research, and say what scientific research was to be undertaken with Government money, establishing paid advisory committees of 'men of wide scientific knowledge assisted by expert investigators and technologists', who would also be paid. In addition, the new Ministry was to 'arrange measures for the mobilisation of the scientific, industrial and educational activities of the nation so as to ensure ready response to national needs and emergencies', and 'generally serve as a national bureau of scientific and industrial intelligence'. The report concluded by stating that 'such a Board would naturally administer the scheme of the Privy Council Committee, as well as take over certain functions of existing Departments and Boards'.¹¹⁴ The Memorandum was sent directly to the Reconstruction Committee.

Finally, on 1 December the Committee of the Privy Council for Scientific and Industrial Research was formally constituted as a separate Department of Scientific and Industrial Research. The Department continued to be advised by the ACSIR, and the two

¹¹³ See 'The Royal Society: Organisation of Scientific Effort', Chemical News, Vol CXIII (1916), 31 March 1916, pp. 152-3.

¹¹⁴ 'Memorandum on the Relations which should exist in Future between the State and Science, in which the Formation of a National Statutory Board of Science and Industry is suggested', Journal of the British Science Guild, No. 4, November 1916, pp.3-11. All quotations are from p. 4.

still operated under the loose supervision of the Lord President and the Privy Council Committee on Scientific and Industrial Research. The Lord President operated as a Cabinet level representative. This novel position gave the new Department and ACSIR flexibility and autonomy, since its nominal head, the Lord President, had no ministerial agenda from which to set research priorities.¹¹⁵ The new Department was to have its own estimates, and increased financial provision. The BSG expressed the hope that :

The new Department represents the beginning of the Board of Science and Industry, the establishment of which was suggested in the Memorandum to the reconstruction Committee....and it is to be hoped that its functions will eventually comprise all the lines of work suggested in that Memorandum.¹¹⁶

2.3 CONCLUSION

Public science had thus been able to achieve many of the aims it had been pursuing since the Edwardian period during the First World War. A new department of government dedicated largely to civil industrial science had been established, and a key advisory role for scientists had been formalised within the new institutional structure. The ACSIR was supposed to be able to control science policy by setting the research agenda. However, problems remained. The new department was not headed by a scientist: Heath was secretary and had administrative control. Secondly no official organisation had yet been established with central control over research for the fighting services. There were other areas, too, where no official organisation had been established. Here scientists had to rely on existing informal contacts, and continue to press for more formalisation. One of these areas was food research, and I will examine the struggles for formalisation here in a case-study in a following chapter.

But by the end of 1916, the pattern of scientific advice had at least been set. No one scientific organisation was to be given a formalised influence over science policy, rather scientists had been incorporated into the machinery of government. There would be no National Science Council organised by scientists and sitting above existing government departments. Perhaps this had been an unrealistic and politically naive aim all along. Rather

¹¹⁵ See Philip Gummett, *Scientists in Whitehall*, (Manchester, MUP 1980), pp. 24-5. The institutional arrangements enshrined what became known as the Haldane Principle of research council autonomy, which was set out in Haldane's Machinery of Government Report in 1918.

¹¹⁶ *Eleventh Annual Report of the Executive of the British Science Guild*, June 1917, p.2.

scientists were to exercise authority via a nominally advisory role within government, but were actually to have the power to say what research was done. This was a big step, but it meant that while scientists had gained some power, it was on the government's terms. The Royal Society model of informal influence had been institutionalised in the new Department. It was not until after the war that the full (possibly negative) implications of this model became apparent to scientists. All was well if scientists were in control of the new bodies, but if non-scientists came to control them, then scientists, in attempting to gain influence, might end up losing professional control of the very definition of science itself.

The public science arguments for influence over policy of the First World War, like those of the Edwardian period, were rooted in a militant nationalist and social-imperialist conception of national power. I want to suggest that in the latter stages of the war, this kind of rhetoric began to lose direction, with the impending disappearance of the German military threat. It attempted to continue, substituting a threat of German economic dominance, and also sometimes shifting to the threat from organised labour: the enemy within. However, after the experiences of State control during the war, and the greater public tolerance for such perceived socialistic, interventionist measures, it began to look outmoded. Furthermore there was widespread public mistrust of science as the provider of technologies of destruction. The more reactionary scientists and their supporters tried to deflect this association by formulaic criticism of the moral bankruptcy of German science, but their basic message was still one of military and industrial preparedness for future conflict. Years of admiration for German organisational methods in science and government cannot have helped them. At this point a new political rhetoric of science began to emerge. As in earlier periods, it used the language of the new social and cultural common context. In direct contrast to the passé rhetoric of external social Darwinism and militarism, this new rhetoric stressed the importance of science to the further progress of peaceful civilisation. It stressed a liberal conception of science as the provider of freedom and wealth, and portrayed scientists themselves as special but poorly paid workers. This was a rhetoric of

reconstruction and reconciliation, not of rearmament and recrimination. The new rhetoric became the dominant public voice of the scientific community in the years after 1917. However, underlying the common rhetoric were two distinct political agendas held by two groupings which became increasingly polarised as the 'twenties progressed. One still wanted to exert power within the existing society; the other believed that scientists could only hold power in a radically changed society.

The following chapter will show how, after the war, public science attempted to deal with the threats to its wartime gains discussed above: the control of research, and perhaps most importantly the image of science. I will attempt to outline the emergence of this new public science and will examine how it was used by scientists from different ideological positions.

CHAPTER THREE

PEACE TALKS: THE PUBLIC SCIENCE OF THE BRITISH SCIENTIFIC COMMUNITY, 1917-c.1925

The interests of Science are the interests of the community,
and the interests of the community are the interests of
Science.¹

3.1 CHARACTERISTICS OF THE RHETORIC: AN OVERVIEW

Public Science had achieved many of its goals in the crisis of war. Looking back in 1933, the mathematical physicist and socialist, Hyman Levy² described the Government's perception of the national importance of science at the outbreak of the war in 1914 with some irony:

...when it became clear that the assistance of technicians was essential to the successful prosecution of the fighting, when in fact it became evident that the potent and indeed the determining factors were likely to be to be associated with the extent to which the belligerent armies were armed and supplemented by inventions of scientifically destructive weapons, scientists were enrolled in army categories as mechanics and labourers.³

He noted that 'the surprise with which we now regard the status thus allotted to what is now recognized as a very fertile source of industrial practice and of philosophical speculation is itself an index of the change that has taken place in the interim'.⁴ Evidence of this change, he argued, was the proliferation of government scientific institutions, employing more and more scientists.⁵

The war was indeed a watershed in the attitude of the British government to science, and one which to a large extent survived the de-control and retrenchment of the immediate

¹ Sir Richard Gregory in 'Scientific Men as Citizens', address to meeting of the Cambridge Branch of the National Union of Scientific Workers, 16 Nov. 1921, *Nature* Vol.108, p. 41

² Hyman Levy (1889-1975), Scottish born mathematical physicist, educated at Edinburgh, Göttingen and Oxford, aerodynamic research department, National Physical Laboratory, 1916-20, leading member of NUSW, Professor of Mathematics, Imperial College, London, 1923-54. See Gary Werskey, *Visible College*, (London, Free Association 1988; originally Allen Lane, 1978), pp. 44-52.

³ H. Levy, p. 225, 'Science', in Hearnshaw, F.J.C. (ed.), *Edwardian England, 1901-1910: a Series of Lectures delivered at King's College, University of London, during the Session, 1932-33*, (London, Ernest Benn, 1933), pp. 204-30.

⁴ *Ibid.*

⁵ *Ibid.*, p. 226.

post-war years. The change had two important aspects. The first was a realisation of the importance of science to the security and economic prosperity (themselves interlinked) of the nation. This resulted in new government initiatives on science, and new money. The second, and related, aspect was the new channels of access that the new attitude and the new initiatives provided. During the war a new, more (but not by any means completely) centralised system for the organisation of scientific research had evolved which enabled scientists to participate in decisions about both industrial and, to a lesser extent, military research. The most obvious and major new commitment was the attempt to centralise government scientific research for civil industry in the DSIR. The Department set up an increasing number of research stations: the Fire Research Board (1917); the Food Investigation Board (1918); the Industrial Fatigue Board and the Tin and Tungsten Board (1919); and the Forest products, Building, and Radio Research Boards (1919-20). In 1918 the Department took over the National Physical Laboratory from the Royal Society, which continued to control appointments to the Laboratory's Executive Committee,⁶ and in 1919 the Geological Survey was taken over from the Board of Education. Furthermore, the DSIR launched in 1917 a new initiative for promoting industrial research and technology. This was the idea of the Co-operative Trade Research Associations. These were joint ventures of government and areas of industry with funding split between the two: the State matching contributions from industry pound-for pound. The aim was for the State to stimulate industrial research and the application of new technologies by fostering a pooling of information and joint research activities. Government money came via the Imperial Trust for the Encouragement of Scientific and Industrial Research, with capital of £1,000,000 for five years, voted in August 1916, to be controlled by the DSIR. By 1920 there were eight Research Associations with an annual cost of £198,000. By 1921 there were twenty one representing, among others the photographic, scientific instrument, engine manufacturing, iron, glass, fuel, and radio industries.⁷ All this represented a dramatic wartime conversion of the British government to belief in the worth of scientific research in war and peace, and a major financial commitment. At the same time there had been a proliferation of government

⁶ See Eric Hutchinson, 'Scientists and Civil Servants: the struggle over the National Physical Laboratory in 1918, *Minerva*, Vol. 7 (1967), pp.373-98.

⁷ On the DSIR in this period see Alter *op.cit.* pp.201-13, Rose and Rose *op.cit.* pp.40-, and MacLeods *op.cit.* pp. 312-17

scientific bodies involving outside civilian experts interacting with the armed services. For instance the Board of Invention and Research at the Admiralty (established July 1915), the Munitions Invention Department at the Ministry of Munitions for the Army (August 1915), and the Air Inventions Committee (finally set up in September 1917, but planned as early as May 1916 by the Air Board).⁸ Scientists had also increasingly served on various ad hoc government committees, and had entered the civil service on a temporary basis as scientific advisers.⁹ Individual university-based scientists had also worked on a myriad of war-related research projects.¹⁰ As we noted in the previous chapter, there was also an ultimately ill-fated attempt to co-ordinate research for the services under the DSIR in 1920. More evidence of this mood of realisation of the importance of science came in 1918 with the stress laid on government research in Haldane's Report of the Machinery of Government Committee, and the report of the Thomson Committee on the position of Natural Science in the Educational System of Great Britain, which argued for more science in the curriculum.¹¹

It is worth noting, however, that although in many areas public science had achieved notable successes, the pattern for the organization of government research that had been established with the DSIR/ACSIR in 1916 was continued. There was to be no National

⁸ The AIC had twelve members, mostly drawn from other government organizations doing warlike research. These included, Horace Darwin (chairman, and member of BIR), the physiologist A.V. Hill (who, with Darwin was also conducting anti-aircraft research at the MID), L. Bairstow, Richard Glazebrook (BIR member), Joseph Petavel (who were all also members of the Aeronautical Advisory Committee), Dugald Clerk (who had been directing naval engineering research), and Sir Alexander Kennedy (Professor of Mechanical Engineering at Imperial College, and MID member). See Pattison, *op.cit.* p. 522, and Hartcup, *op.cit.* p. 28. There were also other bodies in aircraft research with substantial scientific representation: for example, the Aeronautical Research Committee, which replaced the Aeronautics Advisory Committee (AAC) in 1920. The AAC, established in 1909, had appointed numerous technical sub-committees during the war which had done valuable work on, for example, propulsion, structures and materials problems. See Dearle, *op.cit.* p. 42.

⁹ For instance in the Ministry of Food

¹⁰ The Universities were used extensively as a network of research institutions by various government bodies conducting war-related research. However communications and co-ordination of research were often hampered by the need for secrecy and inter-departmental and inter-service rivalries. See for example, 'Science for War: the Work of the Modern Universities, A Visit to the North', article in the *Times*, 9 February 1916; and 'Science and War: Research Work at Birmingham University', *Chemical News*, 28 February 1919, p. 104. For a comprehensive overview see Michael Sanderson, *The Universities and British Industry, 1850-1970*, chapter eight. For example, from June 1915, Frederick Soddy worked in the Chemistry Department at Aberdeen at the request of the Royal Society Chemistry Sectional Committee on the synthesis of diethylaminoethanol and acetal. These substances were required in the preparation of local anaesthetics such as novocain which were in short supply, having previously been obtained from Germany. As a radiochemist, Soddy also worked on projects involving the use of radium (for example to illuminate instrument panels), for the Royal Aircraft Factory, the Optical Department of the Ministry of Munitions and the Compass Department of the Admiralty. From January 1916, he was also involved in the development of an alkali boiler to power submarines for the BIR, though this eventually proved abortive due to the difficult relationship between the Admiralty and the BIR. He also worked for the Explosives Department of the Ministry of Munitions on the extraction of ethylene (for use in the manufacture of mustard gas) from coal and coke oven gases using cold charcoal. See Kenneth R. Page, 'Frederick Soddy: the Aberdeen Interlude', *Aberdeen University Review*, no. 162, (Autumn 1979), pp. 127-48, especially pp. 130-5 and 139-41.

¹¹ Both 1918: C.d. 9230 and 9011 respectively.

Science Council (or Ministry of Research as Haldane's report had suggested), but a network of autonomous research councils, under the Privy Council, and various bodies attached to these. Rather than give scientists collectively any centralised influence over policy, what influence they did gain (largely by being given control of research agendas) was piecemeal. The State relied on a network of key trusted individuals to co-ordinate research across these divisions by informal contacts (for example Tizard at the Co-ordinating Boards, Hardy at the Food Investigation Board, Fletcher at the Medical Research Council). This seems like an attempt to reach a compromise between the demands of public science and the reluctance of the State to give scientists executive power. In the short term it may have worked reasonably well, but it relied too heavily on the special personal qualities and network of professional friendships of the key men to be of lasting effectiveness.¹²

Scientists, then, enjoyed greater influence over science policy after the war than before it. Their peacetime activities and rhetoric were geared to maintaining and advancing this position. Richard Gregory argued in 1918 that Britain should learn the lesson of the war and never again forget that industrial well-being rested on the efforts labour and pure and applied science:

Necessity has forced the Cincinnatus of Science from the plough...it is to be hoped that he will not be permitted to return again to his modest field but will lead our industrial forces to victory.¹³

Superficially this seemed like a call for science to be fully utilised by the State in the economic competition which would follow the war, and perhaps for the retention of the central organization of research for these purposes. However, buried in the classical allusion was again the call for wider policy-influence for scientists: Cincinnatus was a legendary Roman hero, who was called from his farm to be dictator. He laid down his office and returned to his plough after delivering his country from the Aequians, but Gregory clearly intended that Scientists should retain and increase their power in the State.¹⁴

¹² See R.V. Jones, 'Scientists and Statesmen...', *op.cit.*, and Eric Hutchinson, 'A Fruitful Cooperation between Government and Academic Science: Food research in the United Kingdom', *Minerva*, Vol. 10, (1972), pp. 19-50.

¹³ Gregory, 'The Recovery of Key Industries, preface to descriptive catalogue of the British Scientific Products Exhibition, 1918 (British Library original destroyed c.1940 so quoted here from Armytage *op.cit.*, p. 79) .

¹⁴ See *Brewers Dictionary of Phrase and Fable*, (Cassel, London, 1987), p.236

While this theme does sometimes reappear self-consciously in post-war public science, the rhetoric had also changed with the times. This was an era of new large-scale government funding for science. Research was organized, as we have noted, around a network of government research councils. Within this framework, scientists were supposed to have control of the research agendas, and thus ultimately of science policy. However, there was much concern, as there had been when this system was established during the war, that the administrative heads of the new organizations were, more often than not, non-scientists, and that the State could control science policy through these men and through the purse strings. In such a climate of concern the central focus of public science quite naturally fell on the control of research and science policy, rather than on general policy. The overriding concern was to establish the primacy of pure over applied research. This, indeed, was the stated purpose of the collection of essays commissioned from leading Cambridge science graduates by the Master of Downing College, A.C. Seward, and published in 1917. This bore as its opening quotation T.H. Huxley's dictum that "What people call Applied Science is nothing but the application of Pure Science to a particular class of problems".¹⁵ In his introduction Lord Moulton expressed the fear widespread in the scientific community that the State's awakening to the national need to support science would lead to a narrow focus on applied problems. Moulton wrote that the collection:

...admits that it is motivated by a fear lest the universal feeling that England has been remiss in the cultivation of large branches of Industrial science in the past and the widespread determination to remedy this in the future may lead to a neglect - absolute or comparative - of Pure Science after the War is over and that the pursuit of Pure Science may suffer by reason of the concentration of national effort in the direction of more utilitarian applications of Scientific Research.¹⁶

This distinction was a cipher for a reassertion of professional competence to assess which researches should be done, which meant the direction of science policy itself. The fear was that with new State funding and overall control only applied research would be done. This would effectively mean that the State's priorities would be served by science, and that the State would come to define the very nature of scientific activity. This concern was explicitly

¹⁵ A.C. Seward, *Science and the Nation: Essays by Cambridge Graduates with an Introduction by the Right Honourable Lord Moulton, KCB, FRS*, (Cambridge, CUP, 1917).

¹⁶ Lord Moulton, 'Introduction', in *Ibid.*, p. viii.

voiced on many occasions. For instance, Sir William Tilden, Professor Emeritus of Chemistry at Imperial College, wrote in 1917 that,

There is frequent reference to State assistance in research. This is a difficult question. While there would be practical unanimity in the feeling that State assistance should be given in the form of money, there would probably be much difference of opinion as to the way in which it should be applied. State-aided or controlled institutions are apt to fall under the wheels of routine, and epoch-making discoveries are not likely to proceed from such establishments....¹⁷

A reassertion of the worth of pure research by scientists was therefore a reassertion of the scientists' unique professional ability to define what was meant by science. The very terminology used by scientists - pure research was also called basic or fundamental - reflects this, and was itself a form of public science. It was meant to impress politicians and the public that this was an area of crucial national importance for the future development of science (including future applications, as yet undreamt of), which only those who knew could formulate. As Tilden noted:

...it cannot be too often repeated that *pure science* - that is, the correct observation of fact and the establishment of 'law'- stands ever in practical importance before *applied science*, which is invention. But this is a hard saying, and there are still too many people who believe that the true and only business of science is to find out useful things....It is, however, only necessary to consider any application of science to useful purposes to perceive that such application became possible only at the end of a long series of observations, experiments and arguments which occupied the labours of several generations of men. Each step forward is usually the result of some apparently trivial scrap of new knowledge acquired without regard to the question whether it is likely ever to be turned to any practical purpose. Real progress comes from the pursuit of knowledge for its own sake.¹⁸ (original emphasis)

Safeguarding scientists' control over the nature and scope of scientific activity was of crucial importance in the campaign of public science for influence over policy for scientists. Scientists had to retain control of what science was, because their definition of science (central to which was the scientific method, the pure form of which was supposedly found in basic research) was central to their claims for power.

Such questions of professional status and control were also viewed as essential contributions to the upgrading of the public image of science, which was a first step to gaining wider political power. This trend was exacerbated by the new sense of community

¹⁷ Sir William Tilden, Chemical Discovery and Invention in the Twentieth Century, (London, Routledge, 1917), p. 469.

¹⁸ Ibid., pp. 469-70.

and professionalism engendered by war service. Years later, Levy remembered the effects of the war on the scientific community:

The war of 1914-18 was the occasion for the birth of the scientific profession. In the teeth of entrenched opposition scientific men forced recognition in the various fields of war activity....Science in the fundamental sense gained little. What was created of permanent value was a new sense of solidarity among the younger scientific workers. Herded together in the labs, in daily discussion on the problems of work, war and peace, by the end of 1917 they had thrown up three distinct groups at different centres striving to form a representative organisation to protect their economic interests, and - significantly enough - to ensure that science and scientific method were accorded their due place in working out the welfare of the community.¹⁹

As Levy noted, this experience shifted the emphasis of scientific concern to the formation of professional groups to maintain and advance the new socio-economic status of scientists. This desire culminated in the formation of new professional associations and in emergence of a trade union style organisation: the National Union of Scientific Workers. These developments were aimed primarily at protecting the economic interests and social status of scientists, but were also intended as part of the overall upgrading of the image of the scientist to that of a trusted professional with an accepted role in policy.

As we shall later see, sections of the NUSW did also make direct attempts to gain influence over policy. However, during the twenties political involvement became a controversial and divisive issue both within the NUSW and in the wider scientific community, for two main reasons. Firstly, the use of science in war was a double-edged sword. It had alerted the public and the government to the importance of science in national life, and had given scientists fresh hopes of influence. However, science in the twenties enjoyed an ambiguous reputation as both potential saviour and destroyer of civilisation. Science had been seen to be not only concerned with technological industrial improvements but also with the development of ever more deadly weapons technology, and especially the horrors of poison gas, which offended against the archaic liberal myth of chivalric warfare. Scientists tried to deflect this perception by publicly stressing the defensive nature of British military technology, and contrasting this with the immoral offensive German use of science in war. However, this was not simply a public relations problem. Some scientists also felt

¹⁹ Hyman Levy, Modern Science: a Study of Physical Science in the World Today (London, Hamish Hamilton, 1939), p.95.

deeply troubled by being confronted with the implications of their pre-war and wartime militaristic rhetoric (which, as we saw in chapters one and two, seemed to condone the use of science to develop such weapons), and particularly with the implications of their own war work for the whole question of the use of science in war.²⁰ As Levy commented in 1939:

If the scientific profession was born during the period of warfare, it was cradled and nursed during a period of scientific and social disillusionment. It has grown up in an atmosphere of scientific negation. In the creation of poison-gas, high explosive shells, thermite bombs, it has been a helpless witness and an unwilling participant in the perversion of chemical knowledge. In the new destructive possibilities of aircraft it has seen its dreams turn to nightmare.²¹

This passage repeats the same tactics of distancing science from its perverted use in war, that (as will be seen) began to be used from about 1917. To improve the public image of science (and thus the possibilities for power for scientists either within the existing, or a new social organisation), and to salve the consciences of individual scientists, science was presented as essentially liberal.

Secondly, the economic slump of 1920-21 had a serious impact on science with research funding falling victim to the attentions of the Geddes Committee on Public Expenditure. This crisis, combined with science's perceived image problem, sharpened the focus of public science on professional issues, and on consolidating scientists' position in policy-making. The upshot was a mood of apathy among British scientists towards involvement in the wider issues of policy-making. For the majority of scientists, retreat into the laboratory and concern only with professional issues, meant not having to face the implications of the relationship of science and war, and not having to deal with the image problem. There may also have been a sense of actively distancing science from politics, until the public image of science had been resuscitated. This bears comparison with the professional/political strategy of Marshall for economics which will be examined in chapter five, although in the case of the scientists, it does not seem to have been so orchestrated.

The shift in the themes and strategies of public science in the period 1917-c. 1925 can be related to the periodisation of public science by Frank Turner which was the starting

²⁰ Crucial in suggesting lines of enquiry in this section has been David Edgerton's pioneering article 'British Scientific Intellectuals and the Relations of Science, Technology and War', in Paul Forman and J. M. Sanchez-Ron (eds.) National Military Establishments and the Advancement of Science and Technology: Studies in Twentieth Century History, (Forthcoming Dordrecht, Kluwer, 1994). I am grateful to the author for an advance copy.

²¹ Hyman Levy, Modern Science..., op.cit., p. 95.

point of this part of the thesis. As was noted, Turner characterised public science in the period after 1870 as playing on the 'values of collectivism, nationalism, military preparedness, patriotism, political elitism and social imperialism'. Science was 'portrayed as a means to create and educate better citizens for state service and stable politics, and to ensure the military security and economic efficiency of the nation'.²² In the period of Peace and Reconstruction there was a shift in the themes of the rhetoric, corresponding to the new social, cultural and political climate. Now two streams of public science emerged. In characterising these streams it is useful to employ the typology coined by Gary Werskey in his analysis of scientific political rhetoric in the thirties. He talked of 'Reformists' and 'Radicals': the former wanting power and professional status within the existing society; the latter wanting revolutionary socialist social change and scientific technocracy.²³ I want to employ these terms to look at the roots of the positions taken up in the thirties, according to Werskey. I also want to characterise this as a transitional period between the post 1870 public science, identified by Turner, and Werskey's scientists of the thirties. Thus, in the twenties, the Reformist stream stressed the peaceful applications of science, and the benefits of co-operation between science, capital, government and labour to ensure continued British success in the traditional capitalist economic system. The Reformist stream also attempted to rehabilitate the public image of science, after its association with destruction, by arguing that it was not science but corrupt politicians and public morals which were responsible for the perversion of scientific discovery into war uses. By arguing thus, public science sought to allow scientists to have their cake and eat it. On the one hand they were not responsible for political uses of science. But on the other they were justified in seeking political influence, for only the application of scientific method or spirit to politics would correct the perversion of science, and save the existing constitution, and indeed, civilisation. This Reformist stream was, as the typology suggests, merely a variant on Edwardian and wartime public science. It was an attempt to express old concerns in the language of a new era. Thus it was essentially social-imperialist, was voiced by the traditional elite of science, and was aimed at preserving the social and economic status quo. While the themes of

²² Turner, *op.cit.*, p.592

²³ See Gary Werskey, 'British Scientists and Outsider Politics, 1931-1945, *Science Studies*, Vol. 1 (1971), pp. 67-83. See also his 'Nature and Politics between the wars, *Nature*, Vol. 224 (Nov. 1 1969), pp.462-72; 'The Visible College A Study of Left-Wing Scientists in Britain, 1918-1939, unpublished Ph.D. thesis, Harvard University, 1973; *The Visible College*, *op.cit.*, and his 'The Perennial Dilemma of Science Policy', *Nature*, Vol.233, 22 October 1971, pp. 529-32.

Reformist rhetoric were meant to consolidate science's new position, there were few attempts in the post-war period to suggest new institutional mechanisms through which scientists could more effectively wield power. It was as if The Reformists had gone as far as they could. In spite of their, at times, anti-democratic rhetoric, they wanted power within the existing society. Thus, by the mid-twenties, both Nature and the BSG seemed to be losing their way, uncertain of what more they could demand, and thus unsure of their role in the social relations of science.

However, a new Radical stream of public science also now made its appearance. This was more socialist and sought a revolutionary change in the social hierarchy and the economic basis of society. This stream emanated from the younger scientific workers that Levy talked of as being so influenced by their communal wartime experiences. It was not the voice of the elite of science trying to gain power in the traditional social and political set up, but the voice of marginalised scientific workers wanting to re-order society on neo-socialist, scientific lines, with themselves as directing technocrats. This stream stressed the necessity for radical social change, arguing that it was not the short-comings of existing leaders, but of the capitalist and democratic system itself which perverted science into hostile uses, and thus prevented its fullest exploitation for relieving social and economic problems. This stream also emphasised the liberal, international, pacific nature of science and the need for science to care for the whole community. However, these themes, held in common with the Reformists, since all public scientists perceived the need for consolidation, were here used to advance much more radical political aims. The Radicals had not yet achieved all they wanted, and believed that the only way that scientists could hold meaningful influence over policy was in a revolutionised society and constitution.

However, it is important to point out at the outset that, since we are observing the roots of the 'thirties positions in this period, the distinction between the two streams is not as clear cut as in the 'thirties. Reformists sometimes appear radical and vice versa.

In the rest of this chapter, then, I will examine how public science sought to consolidate the increased status and access to influence over policy that scientists had gained during the war. I will first concentrate on strategies for overcoming science's

fundamental image problem. I will then look at tactics for consolidating the new professional position of science, and also focus on the debate about the control of research. Finally, I will briefly examine the different strategies and rhetoric of the two streams of public science - Reformist and Radical - which characterise this period.

3.2 CONSOLIDATING THE WARTIME GAINS

3.2.1 SHIVA OR BRAHMA? THE PUBLIC IMAGE OF SCIENCE AT THE END OF THE WAR AND THE RESPONSE OF SCIENTISTS

After the war there was a certain amount of optimism expressed (largely by members of the scientific community) about science and the possibilities for progress that it afforded. Scientific popularisers like J.W.N. Sullivan lauded the scientist as the modern hero and science as the guarantor of moral as well as material progress:

...in relation to man, his present state and possible future, science alone...speaks with the accent of authority. The great constructions of science are grandiose without being chimerical; they are beautiful but not deceiving. Indeed, one sometimes has the feeling that it is only in science, nowadays, that one still meets with the spirit of adventure, the sense of boundless and glorious possibilities, with an exultant hope.

Scientists were 'romantic and daring' and the current age was because of them 'at the morning of a glorious renaissance'. Interest in science and its objectivity would cause a change in popular values:

The impossible will no longer be attempted, but the region of the possible will be seen to be vastly greater. Man will see in what directions he can shape his destiny, and he will be able to enter on the task with rational hope. All his courage and endurance will have a chance of victorious achievement; he will know that he is not engaged in a forlorn hope; the world will become young again.²⁴

Sullivan was friendly with leading members of the NUSW and another famous member the physiologist, biologist and biochemist, J.B.S. Haldane, also painted a picture of almost limitless scientific progress. In his Daedalus or the Future of Science of 1924, he predicted startling innovations in human biology, including ectogenesis.

²⁴ J.W.N. Sullivan, 'The Hope of Science', pp.169-74 in Aspects of Science (London, Jonathan Cape, originally 1923, reprinted 1927). Quotations from pages 171-2; 174.

However, the prevailing national mood at the war's end seems to have been one of public mistrust of science. In May 1917 Nature complained bitterly about an article in the Daily Mail which had resuscitated a well-known quotation from George Gissing's Private Papers of Henry Rycroft in order to associate science with the horrors of the present war:

I hate and fear 'science' because of my conviction that, for long to come, if not for ever, it will be the remorseless enemy of mankind. I see it destroying all simplicity and gentleness of life, all the beauty of the world; I see it restoring barbarism under the mask of civilisation; I see it darkening mens minds and hardening their hearts; I see it bringing a time of vast conflicts, which will pale into insignificance 'the thousand wars of old', and, as likely as not, will overwhelm all the laborious advances of mankind in blood-drenched chaos.²⁵

Science had a two-fold image problem. Firstly it was associated with German barbarism and perceived moral bankruptcy. This association had ironically been partly forged by the scientists themselves: Edwardian and wartime public science had paraded the spectre of Germany as the scientific nation *par excellence* in order to attract government attention to the importance of science. Secondly science was associated with the new weapons of war, and especially poison gas. These two images merged to create the idea that science itself caused moral degeneration. Such attitudes seem to have been a 'popular prejudice'²⁶ and found further expression in an interesting pamphlet by Avary H. Forbes entitled Salvation by Science! or Devilization in War and Peace, published in 1917. Forbes, a barrister and author of the 1897 work Is Science Guilty?, argued that science had debased the German moral character and that British society was in danger of suffering the same fate by its use of science in war and peace. He memorably described the reputation science had earned for itself in the war, particularly through the use of poison gas, in the words of an army chaplain at the front: 'It is not war, it is murder by chemistry'. Forbes invoked the image of Frankenstein's monster to describe science, and argued that science had degraded mind and character by habituating men to the scientific savagery of modern war. Forbes believed that this would not be the last war but merely a prelude to a worse one in which science would play an even greater part:

It will probably begin by the spreading of the virus of malignant disease - consumption, cancer, small-pox, cholera etc. - amongst the nation to be attacked; and when the people are stricken and

²⁵ Nature, Vol. 99 'Notes, 17 May 1917, p.230. See also Vol. 102, December 5 1918, p.268

²⁶ Nature, Vol.99, op.cit.

demoralised in this way, the army will march in and complete the conquest.²⁷

This dismal picture also included another criticism of science: it would cause massive unemployment and other social problems in peace. In a eerily predictive passage, Forbes contrasted 'Two Pictures', arguing that the obverse of scientific progress was unavoidable social malaise:

Look on this picture: An age of steam locomotion- steamers, railways, motors, air-ships; steam agriculture- ploughing, threshing, winnowing...steam spinning- weaving, netting, dyeing, washing, printing, and thousands of other industries; an age of machine digging, sowing, mowing, reaping, and steam-work of almost every kind; an age of electric railways, electric tramways, electric motors, electric cycles, electric lighting and heating, and cooking, telegraphing, and chemical analysis; an age of patent medicines, of new specifics, of vivisection, of research endowment, of scientific lectures, scientific exhibitions, and of compulsory education.

Now look at this picture: An age of slums, poverty, unemployed, sweating, starvation wages, break-neck struggle for existence, suicidal competition; an age of long hours, leisureless labour, Sunday work, nerve strain, epidemic break-downs, new diseases, multiplication of asylums and appalling increase of lunacy; an age of cheap imitations, veneered articles, shoddy clothes, jerry building, adulteration of almost every manufactured article, trade frauds, commercial lies and misrepresentations and scientific crimes; an age of strikes and dead-locks between capital and labour, accompanied by an ever-increasing spirit of exasperation, hostility and violence.

If the reader can see no causative connection between these two pictures, how does he explain their synchronism?

No, the times we live in are not times of development and civilization, but of what may be expressed by a word compounded of these two, namely, 'Devilization'.²⁸ (original emphasis)

Scientists were only too acutely aware of the seriousness of this image problem.

Nature observed in 1922 that the public saw science as materialistic and amoral:

In their view science is associated with the transformation of beautiful countrysides into the slums of industrial centres, with high explosive shells and clouds of poison gas to supersede the slings and arrows of earlier days.²⁹

As early as 1915 the banner of the British Association for the Advancement of Science meeting at Manchester had shown the figure of Science hiding her face in shame, surrounded by the guns of war. Her guilt was further emphasised by the foregrounded

²⁷ 'Salvation by Science...', (London, Marshall Brothers, 1917), pages 15; 27; 29

²⁸ *Ibid.*, pp53-4

²⁹ Nature, Vol. 109, unsigned leading editorial, 'The Influence of Science', unsigned leader, pp.801-3; p.801.

image of a snake: Science had allowed mankind to eat from her Tree of Knowledge and was stained with original sin. That year's Presidential Address, given by Arthur Schuster, rehearsed in a moderate form, the argument that would later be used by public scientists to justify Science's involvement with war, and to rehabilitate the image of science. The war had been a perversion of the aims of science and of her internationalism. But scientists were justified in aiding the prosecution of the war, for it was a conflict against German nationalism, which threatened to disrupt the international scientific community. The war was a Just War, a war for civilisation, in which it was the duty of scientists to take part:

Happy were the times when it could be said with truth that the strife of politics counted as nothing before the silent display of the heavens. Mightier issues are at stake today: in the struggle which convulses the world, all intellectual pursuits are vitally affected, and Science gladly gives the power she wields to the service of the State. Sorrowfully she covers her face because that power, acquired through the peaceful efforts of the sons of all nations, was never meant for death and destruction: gladly she helps, because a war wantonly provoked threatens civilization and only through victory shall we achieve a peace in which once more Science can hold up her head, proud of her strength to preserve the intellectual freedom which is worth more than material prosperity, to defeat the spirit of evil that destroyed the sense of brotherhood among nations, and to spread the love of truth.³⁰

However, public scientists feared that the public, which had long been presented with Germany as the epitome of a scientific nation, would simply equate science with perceived German Barbarism. Thus the first step in rehabilitating the public image of science was to attempt to separate science from its German associations. In early 1917 the British Science Guild President, Lord Sydenham, who (as was noted in chapter two) had formulated a scheme for a national science council in 1915, expressed the stock sentiments about Germany. It was not science but,

The exultation of the State as a separate entity - the incarnation of force that could do no wrong and that must be blindly trusted and obeyed - destroyed the moral sense of the German people, and they now stand revealed as senselessly brutal barbarians. Their National organisation proved pernicious, because it created an overweening belief in the superiority of Germans....While there is much that we may well learn from German methods, and especially from German

³⁰ A. Schuster, p. 134, 'British Association for the Advancement of Science, Manchester 1915. Inaugural Address of the President', in Chemical News Vol.CXII, 10 September 1915, pp.127-134. See also Giuliano Pancaldi, 'Scientific Internationalism and the British Association', pp. 145-169, in Roy MacLeod and Peter Collins (eds), The Parliament of Science The British Association for the Advancement of Science, 1831-1981, (Northwood, Science Reviews, 1981).

thoroughness and hard work, we have been provided with a terrible warning of what to avoid.³¹

In its first leader after the signing of the Armistice, Nature, was quick to reinforce this view that it was not science that was essentially evil, but only science in the service of a morally corrupt Germany:

The execrable deeds of the German land, sea, and air forces cannot be excused by reference to any sound principle of human progress. The spirit represented by such acts as the murder of innocent and unoffending non-combatants, heartless cruelty to women and children, and destruction of priceless buildings, is unworthy of twentieth century civilisation....Science and scientific principles must not be held responsible for these outward and visible signs of moral degeneration. Chlorine was used as a bleaching-powder for a hundred years before the Germans adopted it as a poison gas....The search for truth, and the discovery of new substances and forces in Nature, must not be impeded because unworthy use may be made of the results. What has to be done is to advance moral and ethical ideas to higher levels, so that new knowledge shall benefit the human race instead of being used to destroy it. Unless this is accepted, there will be an end of civilisation, for it is possible to conceive of a time when the forces at man's disposal will be so strong that a hostile army or an enemy's city may be destroyed almost at the touch of a button.

The same editorial continued:

The popular mind has associated science and specialised education with German truculence and perfidy, and has even supposed that these conditions are necessarily related to each other. The characters exhibited by Germany in the conduct of the war are not, however, the result of overcultivation of science, but of a disastrous deficiency in moral and ethical training....We have nothing to fear from making science the main axle of the educational coach instead of a fifth wheel, provided only that the right position is given to character training as well.

This was a potentially dangerous, self-defeating argument, as it seemed to imply that science could only be applied for moral purposes by leaders who had been traditionally educated in the classics. As Nature argued: 'Our system of education was inefficient, but it produced a nation of young heroes'.³² However, this leader concluded with what was to become the stock defence of science, and an argument for greater involvement of science in government policy. If the nation was to use science morally and effectively in peacetime,

...it must look to knowledge for its support, and not let itself be cajoled by the platitudes and promises of party politicians. Democracy has hitherto permitted itself to be swayed by eloquence, and has elected to be governed by men of words rather than by men

³¹ Sydenham, p. 66, 'National Reconstruction', Presidential Address to BSG, April 30, 1917, 11th Annual Report of the BSG, (June 1917), pp.65-73.

³² 'War and Peace', unsigned leader, Nature, Vol.102, pp.201-2. All quotes from p. 201

of knowledge and action. The consequence is that men are entrusted with power, not because of any fitness they have shown for the offices they occupy, but because of their political influence or friendships. Scientific and technical experts have been used, but only as hewers of wood and drawers of water, while administrative control has usually been in the hands of officials with no special qualifications for their directorships.³³

Scientists were presented as the ultimate safeguard against the misuse of science. Whether it was immoral Germans, or British politicians, who were using science for corrupt and perverted ends, the antidote was scientists in positions of political power. Only scientists could ensure that science was utilised for its true, peaceful purpose.

As ever, Ronald Ross's Science Progress had already expressed this indictment of traditional politicians even more forcefully:

Most people have concluded by now that the war...was due to the mis-government of the world by essentially wrong types of persons, who rule in the interests of themselves rather than of humanity or of their nation. The problem of the future is how to replace these persons by higher types....So long as we continue to believe that persons who have never seen or done anything are as good as men of the widest experience and achievement, so long shall the world suffer from wars, massacres, injustice, destitution, insanitation and crime. Let us hope that this war will abolish not only German militarism but the whole lying and canting democratic hypothesis of equality. The best men at the top is the only sound rule; and it remains to find how to put them there.³⁴

Essentially, this was an old theme - the anti-democratic strand of Edwardian and wartime public science - put to new use. It now served to deflect blame for the use of science in war to the rulers not the scientists. This then allowed scientists to continue to claim political power. In fact, it was their duty so to do, for, according to their arguments only scientific government could stop the potentially cataclysmic perversion of science. Gregory expressed the refined form of this argument in 1921:

Mankind has, indeed, proved itself unworthy of the gifts which science has placed at its disposal, with the result that squalid surroundings and squandered life are the characteristics of modern western civilisation, instead of social conditions and ethical ideals superior to those of any other epoch. Responsibility for this does not lie with scientific discoverers, but with statesmen and democracy. Like the gifts of God, those of science can be made either a blessing or a curse, to glorify the human race or to destroy it; and upon

³³ Ibid., p.202. See also Gregory, 'Science in the History of Civilisation', Transactions of the Royal Historical Society, 1920, reported in Journal of the BSG, No. 11 (June 1920), p.17, and his 1923 address to the Scientific and Technical Circle of the Institute of Journalists, as reported in Nature, Vol. 112 (1923), pp. 803-4. See also 'The World Misrulers' and 'The Reform of Democracy', two unsigned articles (probably by Ronald Ross), in Science Progress, Vol. XII (1917-18), pp. 295-301 and 301-09.

³⁴ Science Progress, Vol.XI, No. 42 (October 1916), 'This and That' in 'Notes', p.321-2 by the editor, Ronald Ross.

civilised man himself rests the decision as to the course to follow. With science as an ally, and the citadels of ignorance and self as the objective, he can transform the world, but if he neglects the guidance which knowledge can give, and prefers to be led by the phrases of rhetoricians this planet will become a place of dust and ashes.³⁵

The implication here was not only that politicians were immoral, and that they knew nothing about science, but also that to be a scientist was to possess more efficient political ability, and a higher moral sense. We have met this idea that science inculcates morality before, and after the war it re-emerged as another means of strengthening the public image of science. Public science had thus turned the popular association of science with destruction into an argument for power for scientists. This was a way of overcoming what E.A. Burroughs, Bishop of Ripon, was to call, at the 1927 Annual Meeting of the BAAS, the 'ethical gap' between society and science. He argued that the advance of science had outstripped the development of Man's 'moral and spiritual' ability to deal wisely with its discoveries. His, half ironic, solution was to propose a 'scientific holiday' - a ten-year moratorium on new research - to enable Man to catch up.³⁶ But, public science claimed that if scientists were in control the gap was bridged.³⁷

In all this, the scientists were attempting to link science to a new conception of the national interest, one more in keeping with the concerns of post-war British society.

³⁵ Richard Gregory, 'The Message of Science', Presidential Address to Corresponding Societies of the British Association for the Advancement of Science, 8 September 1921, abridged version printed in *Nature*, Vol. 108, pp.533-7. Quote from p. 533.

³⁶ *Times*, 5 September 1927, p. 15, 'The British Association, Bishop of Ripon's Address: Science and Religion'. See Peter Collins, 'The British Association as Public Apologist for Science, 1919-1946', pp. 211-36, in MacLeod and Collins, *op cit.*, p. 215. For further discussion of the 'ethical gap' (or, as he terms it, 'cultural lag') and its use by public scientists particularly in the relations of science and war during the 1930s, see Edgerton, 'British Scientific Intellectuals...', especially pp. 17-21 (numbering from advance copy).

³⁷ It is worth noting that there was also a campaign to rouse industrialists and businessmen to political action, and to press their claims for influence over policy during the war. This surfaced in the scientific journals as it was often allied to calls for power for scientists. Here, the two groups were presented as men who knew, and the scientific method was often equated with the common sense of business decision-making methods. These were compared favourably to the biased decisions of party politicians. These two strands of science and business came together in the Institute of Industry and Commerce, a mixed body of scientists and industrialists founded in 1915 to urge the State to take a lead in encouraging industrial research. The Institute's activities included a series of lectures and pamphlets on this theme. Importantly, in February 1915 the name was changed to the Institute of Industry and Science. See 'Institute of Industry and Commerce' *Chemical News*, Vol CXI (1915), 15 January 1915, p. 31; 'Institute of Industry and Science', *Chemical News*, Vol CXI, 26 February 1915, p. 107; 'British Imperialism. German Kultur Defined', lecture to Institute by its Vice-President and Chairman, J. Taylor Peddie, published in *Chemical News*, Vol. CXI, 5 March 1915, pp. 109-10; and Ian Varcoe, 'Scientists, Government and Organised Research...', *op.cit.*, pp. 198-201. Much of the rhetoric of this body was very similar to that of public science (for instance calls for a joint national council of Industry and Science to be composed of scientists and industrialists). Sometimes, as this chapter shows, such conflated rhetoric does blur the scientists' political demands. But businessmen did themselves produce a rhetoric both in the wartime and Edwardian periods, calling for business influence over policy. This business public science has received little attention by historians and deserves further study, particularly from the outbreak of war into the 1920s. See my M.Sc. thesis, 'Knowledge is Power? A New View of Some Aspects of the Relations of Science and Government in Edwardian Britain', (Manchester University, 1989), particularly chapter three; and John Turner (ed.), *Businessmen and Politics: Studies of Business Activity in British Politics, 1900-1945*, (London, Heinemann, 1984).

Out was the kind of nationalist, militarist rhetoric so common in Edwardian public science; in came the peaceful, liberal values of social and economic reconstruction, and social harmony. Nature summed up the new image of science and the new national image to which it was to be rhetorically associated in December 1918:

Science has nothing whatever to do with conquest, with commercial exploitation, or with upholding the divine right of dynasties. The end of all scientific investigation is to discover the truth about all things, including man, his instincts and impulses, his organisation in society. Were economists and politicians imbued with the scientific spirit it would be of incalculable benefits to the effective organisation of society. Science...[maintains] that the habit of mind developed by scientific studies is at least as important [as religion or the humanities] as an ethical agency. With the completion of the war it will be in a large measure the mission of science to rebuild a shattered civilisation; it will restore industries, house the homeless, feed the hungry, and cure the sick, and, not least, must aid in healing the deep-seated ills of society, the consequences of past social misconduct. If men will use for destruction the discoveries of science, it is not the scientific worker who is to blame.³⁸

I have argued that public scientists perceived science's problem to be one of public image, and so far we have only looked at the evidence of scientific publications. These were important as public scientists were also trying to reassure the scientific community that science had a relevant and beneficent mission in post-war society, and to impress on it the need and possibility of its involvement in social and political activities. Moreover, Nature appears to have been read not only by scientists but by the wider public with an interest in science. Tellingly, Arnold Bennett wrote in 1930 that: 'I regard Nature as perhaps the most important weekly printed in English, far more important than any political weekly'.³⁹ However, public scientists in this period did also undertake a deliberate campaign to confirm the desired image of science in the mind of the wider public. Scientists were careful to cultivate the new image of science as essentially peaceful. Where possible, the civilian nature of science was emphasised over its war uses. Thus, for example, Alexander Findlay's⁴⁰ popular exposition of 'what the science of chemistry...has accomplished for the material well-being and uplifting of mankind' in his Chemistry in the Service of Man, made no mention of poison gas, and devoted only seven out of two hundred and seventy two

³⁸ Nature, Vol. 102, 5 December 1918, 'Notes', p.268.

³⁹ Arnold Bennett in the Evening Standard, 20 November 1930, quoted by Richard Gregory in Nature, Vol. 126, (1929), p. 854. Cited here from Werskey, 'Nature and Politics...' *op.cit.*, p. 462.

⁴⁰ Fellow of the Institute of Chemistry, Professor of Chemistry University of Wales, Director of the Edward Davies Chemical Laboratories, University College of Wales, Aberystwyth.

pages to discussing the war uses of chemistry, in terms of the military uses of explosives.

Even here Findlay emphasised the corresponding peace uses of explosives:

But it is not merely for the purpose of strengthening man's arm in war that explosives have found an application; they have also, by rendering possible such great engineering works as the Suez Canal and the Panama Canal and the boring of tunnels through the mountains of the earth, through their use in mining, and in many other ways, played an important part in the peaceful progress of civilisation.⁴¹

Findlay intended his work as a contribution to the improvement of the public image of science and to maintaining in peacetime the importance in national life that it was enjoying during the war. If this was to happen, 'The mental outlook and the attitude of the people as a whole towards science must be changed, and the scientific habit, and a spirit of trust in science must be cultivated'. The reason why this enterprise was so important was that the author was a public scientist who believed, 'Science stands for efficiency in all the activities of life, and the neglect of science spells waste and industrial decay'.⁴²

Similar in tone was the 1917 work Chemical Discovery and Invention in the Twentieth Century, by William Tilden, which we noted above as an apology for pure research. Here, again, quite incredibly, the only mention of the detailed uses of chemistry in war came in the chapter on explosives. Out of a total of eighteen pages only three were given over to explosives in war, and although there was some discussion of types of shells, explosives and detonators, the chapter began with a familiar apologetic:

But though at the time of writing this book the greater part of Europe is devastated and millions of men are exposed to destruction by the wholesale use of explosives in war, it must not be forgotten that these agents have been among the most powerful auxiliaries in the arts of peace. It is only necessary to consider how many roads, railways, tunnels and water works have been rendered possible by the use of dynamite and other blasting materials to perceive that explosives have a civilising mission of their own, and probably next to steam have done more to facilitate inter-communication between different countries than any other of the works of man's invention.⁴³

Many other such works extolling the essentially peaceful nature of science were produced from about 1917 into the 1920s.⁴⁴ One in particular is worth noting as a final,

⁴¹ Alexander Findlay, Chemistry in the Service of Man, (London, Longmans, Green, 1916, new impression 1918), p.77

⁴² Ibid., Preface, 1916, p. xi. Original emphasis.

⁴³ William Tilden, op.cit., p. 374.

⁴⁴ See for example, William Tilden, 'Chemistry in Relation to National Affairs', Chemical News, Vol. CXV (1917), 25 January 1917, pp. 37-9; and W.J. Pope, 'Chemistry and the Nation', Chemical News, Vol CXVI (1917-18), 26 October 1917, pp. 199-202.

supreme example of the kind of arguments deployed. W.J. Pope, Professor of Chemistry at Cambridge, contributed an essay on 'The National Importance of Chemistry' to Seward's 1917 collection Science and the Nation. Pope was very active on the lecture circuit with this kind of topic at this time, but here he excelled himself. Once again, there was little on the war uses of chemistry, and more on its peaceful applications. What consideration there was of war uses was justified in a paragraph which conflated many of the public science arguments we have already seen. Pope argued that scientists were not responsible for the uses of their inventions or discoveries; paraded anti-German sentiments; posited the clearly spurious argument that it was not scientists but non-scientific administrative heads of government departments who were really responsible for the development of evil weaponry; and finally argued that too much classical learning was very definitely a contributing factor. All in all, he presented a breathtakingly disingenuous account of the relations of scientists and war:

The unhappy events of the last two years have given rise to a widespread belief that the science of Chemistry is largely responsible for the accentuation of the horrors associated with war. This belief is a mistaken one and arises from a failure to comprehend the part played by Chemistry in developing the resources and promoting the prosperity of any great modern nation. A flourishing chemical industry is a perpetual source of wealth to a country and the prime fount of countless ameliorations of the conditions of life....But, in accordance with a natural law, so potent an agent for good becomes a powerful weapon in war, and the unfair use of the weapon cannot be charged against the specialist who devised the tool for some peaceful purpose. Signs are, indeed, not wanting which indicate that science has little to do with the control of German policy and methods. It is impossible to believe, for instance, that any scientific man ever suggested the *Flammenwerfer* could possess any efficiency as a military weapon; it is, however, easy to visualise the chemical engineer producing such an archaic implement at the bidding of a non-scientific chief. German primary and secondary education is more intensely classical and literary than is British; its products naturally tend towards such an inherently false and proportionless outlook on life, affairs, and things as has been repeatedly exhibited to us by an unscrupulous enemy during the past two years.⁴⁵

However, some capital could still conceivably be made out of the war work of science, and thus on rare occasions, Nature did carefully note 'The Nation's Debt to Science'⁴⁶ in this respect. Even then, though, Nature hedged its bets and emphasised the

⁴⁵ W.J. Pope, 'The National Importance of Chemistry', pp. 1-23 in A.C. Seward, op.cit., pp. 2-4. The British flame thrower, used after the Germans first introduced the weapon against the French in June 1915, was developed by an engineer officer, Captain F.C. Vincent. It was improved by Captain W.H. Livens, a twenty-five year old Special Company commander with an engineering degree from Cambridge. Livens also developed the Livens gas projector during 1915 and early 1916. See Hartcup, op.cit. p.68 and p.100-1

⁴⁶ Nature, unsigned leader, Vol. 103, 24 April 1919, pp.141-2

defensive nature of British science, responding to barbarous German science. For example, in December 1918, in discussing a proposal in a letter to the Times from eight eminent members of the medical profession to prohibit future uses of gas in war, Nature, after proposing the prohibition of war itself, went on to note that although warfare had become more scientific, yet:

Science has not merely striven to destroy enemy life; it has striven, and with equal success, to save British and Allied lives. The British pattern of gas respirator is the triumphant product of much exceedingly careful work, and has probably saved more lives than any other contrivance or procedure adopted during the war.⁴⁷

Similarly, R.B. Pilcher, Registrar of the Institute of Chemistry, writing in Chemical News in 1917, detailed some of the general contributions of chemists to the war effort, and even cited commendations from French and Haig which praised the work of chemists in retaliatory gas attacks, as well as their work in gas defence. However, he ended his piece thus:

To sum the matter up, chemists have met the situation with a spirit of true patriotism and have been promptly organised for the service required of them. It is not too much to hope that, as the discoveries of science have been applied to the destruction of humanity, they may be devoted more and more to the furtherance of the arts of peace, to the uplifting of civilisation and the pacification of the world.⁴⁸

This article, itslef a reprint from the original in the Proceedings of the Institute of Chemistry, also formed the last chapter to Pilcher's 1919 work on The Profession of Chemistry.⁴⁹ This was a general introduction for the intending student to the nature, scope, training and carreer prospects in chemistry. It was a product of the desire amongst the scientific community for increased professionalisation at the end of the war to consolidate the socio-economic status which scientists perceived they had gained in wartime. This work was republished in 1927 by the Institute to serve as an 'authoritative guide' for the public on chemistry and a chemical career. The book had been revised by the author with editorial guidance from the Institute's Publications Committee. The new 'Intoduction' stated that this had been done 'in order that it might find a place among the official publications of the

⁴⁷ Nature, 'Notes', Vol. 102, 5 December 1918, p.268. See also the leader cited in note 27 which gives equal emphasis to defensive measures.

⁴⁸ R. B. Pilcher, 'Chemists in War', Chemical News, Vol CXV (1917), 2 March 1917, pp. 97-8.

⁴⁹ See Proceedings of the Institute of Chemistry, Part 1 (1917); R.B Pilcher, The Profession of Chemistry, (London, Constable and Co., 1919), pp. 190-6. This latter version had been 'modified with slight additions' by the author. The sense and tone remained the same.

Institute'. Only one chapter had been omitted from the text of the original edition: the chapter on the role of chemists in the war.⁵⁰

One of the most important planks in this public campaign were the two British Scientific Products Exhibitions organised by Richard Gregory and the BSG. Gregory had taken over the formal direction of the BSG, as well as the editorship of *Nature*, from Norman Lockyer in 1918, although he had been the *de facto* head of both for many years. One of his first actions was to organise an exhibition of the fruits of scientific research. Manufacturers and government departments were contacted and contributed exhibits to 'another version of 1851'⁵¹ held at King's College, London, between 12 August and 17 September 1918. The exhibits took up the first two floors of the college, attracted more than 30,000 visitors, and were accompanied by a series of thirty popular lectures on various aspects of applied science.⁵² Proposing the toast to the Science Guild at the official dinner of the Exhibition, the Marquess of Crewe made it clear that the event was part of a public relations drive:

...the war had brought home to everyone the value of scientific method and knowledge, not only as a weapon in war, but also in industry and education. It was true that the enemy had tasted of the fruit of the Tree of Knowledge, but it was not necessary that this should have the toxic effect it had in Germany - that fruit had turned to poison because of the spirit in which it was eaten. Our task must be to disassociate science from this disastrous spirit, to show that the proper applications of science pursued with reverence and humanity added immensely to the happiness of mankind.⁵³ (my emphasis)

So successful did the BSG adjudge the exhibition to be that it was moved north to Manchester College of Technology for two weeks from 27 December 1918.⁵⁴ A second exhibition was held in the Central Hall, Westminster from 3 July to 5 August 1919. Once again there were public lectures.⁵⁵ The image of science must have received a boost when on 22 July the King and Queen attended.⁵⁶ The Marquess of Crewe explained the need for the second exhibition. The first had taken place before final victory and had emphasised

⁵⁰ Pilcher, *The Profession of Chemistry*, Revised Edition (Prepared under the supervision of the Publications Committee of the Institute, (London, Institute of Chemistry, 1927). Quotations are from 'Introduction' by Professor Arthur Smithells, FRS, President of the Institute, pp. v-vi.

⁵¹ W.H.G. Armytage, *Sir Richard Gregory His Life and Work*, (London, Macmillan, 1957), p. 79.

⁵² Details taken from *Ibid.*, and *Journal of the BSG*, No. 8 (April 1919), pp.19-23.

⁵³ Marquess of Crewe, proposing the toast to the BSG, British Scientific Products Exhibition Dinner, 15 January 1919, *Ibid.*, p.29.

⁵⁴ *Nature*, Vol. 102, 12 December 1918, 'Notes', p.288.

⁵⁵ Armytage, *op.cit.*, p.84

⁵⁶ *Nature*, Vol. 103, 24 July 1919, p.408

industries in the service of war (for example, articles and substances now made in Britain which had been got from Germany before hostilities):

The present exhibition of the other hand, is meant to show the triumphs of British industry in the arts of peace, and to bring home to the general public the importance of the relations between science and industry, and also between education and research.⁵⁷

Nature also supported other scientific exhibitions by giving them notice in her columns: for instance an exhibition of new British and 'key' industries organised by the Industrial Section of the Tariff Reform League in October 1918, and a Scientific Novelties Exhibition at King's College, London, in December 1923 and January 1924.⁵⁸ Nature also, of course, strongly supported the British Empire Exhibition of 1924 at Wembley, hoping that it would show what science had accomplished and would be a 'Temple of Science'.⁵⁹

Concern with science's public image prompted Nature to launch a renewed attack on the aims and purposes of the British Association for the Advancement of Science. In September 1920, Nature editorialised that:

There is, we believe, a feeling among many members of the Association that efforts should be made to increase its usefulness by bringing it into closer contact with thoughtful members of all classes of the community....The public does not understand the Association and the Association makes little endeavour to show the bearing of scientific methods and principles upon most subjects of vital importance in national polity and industrial affairs.⁶⁰

This sparked a vigorous debate about the reform of the Association in the letters columns of Nature.⁶¹ Most correspondents lamented the increasing specialisation of science which meant most papers were full of technical jargon, and quite impenetrable to the general public. More general lectures at meetings to attract in a larger number of the local community were favoured. Soddy summed up the sentiments of the letter writers, when he commented that,

Unless the British Association becomes democratic and acts as a real bond of union between scientific men and the thinking public, rather

⁵⁷ Nature, Vol. 103, 'The British Scientific Products Exhibition' unsigned article, 10 July 1919.

⁵⁸ See Nature, Vol. 102, p.110 and 113, p.92 respectively.

⁵⁹ Nature, Vol. 110, pp.797-8, unsigned leader, 'Science and the Empire', p.798.

⁶⁰ Nature, Vol. 106 (1920-1), unsigned editorial, 'The British Association and National Life', pp.69-72. Quote from p. 69. For a brief discussion of the BAAS in the 1920s see Peter Collins, 'The British Association as Public Apologist for Science, 1919-46', pp. 211-36 in The Parliament of Science..., op.cit

⁶¹ See Nature, Vol. 106, pp.107-13 and 144-7

than as a periodic platform for personages, it does not seem to fulfil any function worth continuing.⁶²

The publicity campaign also included repeated calls for the increased representation of science in school curricula.

The BSG considered positive publicity for science so important in this period that it re-defined itself partly as a publicity service for science. By 1920 the Executive of the Guild had begun to feel that given the victories on science policy and funding of the war years, the Guild should take stock of its position and define a new strategy for retaining these advances, and obtaining more, including a meaningful voice for science in policy issues.⁶³ In early 1921 the Guild initiated 'A New Campaign Against Ignorance'.⁶⁴ The object was to encourage local scientific societies to affiliate to the Guild, and to found local branches of the Guild to diffuse the message of the value of science throughout the provinces. At the 1921 annual general meeting, Lord Bledisloe,⁶⁵ one of the Vice-Presidents, initiated a 'publicity policy' and a 'new campaign of 1922'.⁶⁶ L. C. Bernacchi was appointed special director of an appeal to raise funds to extend the work of the Guild.⁶⁷ Among the proposed ideas to publicise science were a strong provincial organisation; national lecture programmes; a British Science Prize (the national equivalent of the Nobel); a new role for the Guild as information bureau for businessmen ; an expansion of the Journal and a series of popular science publications.⁶⁸ By 1924 the Guild had enjoyed some success in this area. Four publicity leaflets had been published and distributed to newspapers and periodicals. They were: 'Helium and its Uses' by J.C. McLennan; 'Thermionic Valves and their Uses', by J.A. Fleming; 'The Discovery of Manganese Steel and its importance in Modern Engineering' by Sir Robert Hadfield; and one on the 'Fixation of Nitrogen'. The first two had also been published in the handbook of the exhibits in pure science arranged by a Royal Society Committee at the British Empire Exhibition at Wembley. A 'Science News Service' had been established directed by G. D. Knox, who took popular summaries of topical scientific discoveries written by scientists and

⁶² Soddy, letter to Nature, Vol. 106, 23 September 1920, p.112.

⁶³ See Journal of the BSG, No. 11, (June 1920), 'The Annual Report of the Executive Committee', p.7

⁶⁴ Address to Brighton and Portsmouth Rotary Clubs by J. J. Robinson, April 13 and 19, 1921, Journal of the BSG, No.13 (June 1921), pp. 62-70.

⁶⁵ Charles Bathurst, M.P, formerly at the Ministry of Food. A long-serving Guild member.

⁶⁶ Journal of the BSG, No. 15, (May 1922), editorial, p.2.

⁶⁷ Member of Scott's 1901-4 expedition to South Pole, joined the Navy in the war and moved from command of patrol ships in North sea and Mediterranean to Anti-submarine division of the Admiralty. A Liberal: contested Widnes and Chatham in 1910, President of Gillingham Liberal Association. Biographical details from Ibid., p. 11.

⁶⁸ See report of BSG 15th AGM, 6 April 1922, Journal of the BSG, Ibid., pp.31-2.

sold them to the newspapers. So far articles had appeared in The Morning Post, The Liverpool Daily Post, The Manchester Guardian, The Newcastle Daily Journal, and The Yorkshire Post. Science had also been put on the radio by the Guild: Sir William Bragg had given a general talk on the BBC on the work of the Guild, combined with an appeal for funds on 29 January 1923, and Bernacchi had also arranged a series of monthly talks on scientific topics, the first on 5 March 1923 by Gregory on 'Distant Stars and Island Universes'. All speakers had agreed to appear without fee. The Guild could also report that its long-planned conference on 'Science and Labour' was to be held as part of the British Empire Exhibition in May, and was to be opened by the Prime Minister, Ramsay MacDonald.⁶⁹

At the end of 1922, Nature, appealing for support for the Guild's New Campaign, noted the other point of all this publicity work. It was to improve the public image of science so that a cleansed science could take up its rightful place in the counsels of the nation:

It is obvious that valuable national and Imperial service can be performed by a body which has sufficient funds to undertake active propaganda work for the extension of an understanding of the influence of scientific research and its results. The only organisation which is attempting to do this is the British Science Guild, founded in 1905 to convince the people, by means of publications and meetings, of the necessity of applying the methods of science to all branches of human endeavour and thus to further the progress and increase the welfare of the Empire.⁷⁰

The ultimate goal of this campaign to resuscitate the public image of science was, then, still influence over national policy. But public scientists felt that the most effective first step in consolidating their wartime gains was to diassociate science from war. Until the public image had been successfully rehabilitated, and it was felt that the public was again ready to trust the scientists with policy, calls for policy influence were muted. In a later chapter we shall see Alfred Marshall pursuing a similar long game strategy for policy influence for economists.

3.2.2 CONSOLIDATING THE PROFESSIONAL IMAGE OF SCIENCE

⁶⁹ All details of activities above taken from BSG Annual Report, 1923-4, pp. 1-4

⁷⁰ 'Science and the Empire', p. 798, unsigned leader, Nature, 16 December 1922, Vol. 110, pp. 797-8.

The corollary of ameliorating the public image of science to consolidate wartime gains was to ensure that the reputation of scientists as professionals was fixed at least at the new level. This had two purposes. Firstly a straightforward desire to protect and enhance the pay and prospects of scientists, and the social prestige of their new status, which had come from increased career opportunities in the new research organizations. Secondly, this new professional status was also perceived as a key to unlock the door of increased policy influence. Scientists wanted to present themselves as trusted responsible individuals, who possessed a defined body of knowledge with recognised social applications. The way to do this was to enhance their professional structures. The shared wartime experiences of scientists had themselves, as we noted earlier, engendered a new sense of community, solidarity and generally a new awareness of science as a profession, amongst scientists. The war had also witnessed an increase in the power of the trade unions. After the war, there was a natural desire amongst the scientific community to protect their new-found social and economic status. This narrow focus on professional issues became more pronounced with the drastic cuts in science spending of the early twenties. The budget of the DSIR was cut from £556,868 to £330,287, and the government grant to the universities was reduced by £300,000.⁷¹ Such retrenchment policies had an immediate impact on the employment prospects of scientists. The Institute of Chemistry noted an increase in the number of unemployed chemists from 0.7% of its membership to 5.3% between 1920 and 1923.⁷² At the same time conditions of service for employed scientists were less than perfect. In the Civil Service, where many scientists had been inducted during the war on a temporary basis, there were disparities in pay and grading with administrative civil servants which largely continued into the 1930s. Scientists in the universities were squeezed between the twin problems of the funding cuts and growing student numbers caused by demobilised students: the population of British universities grew by 56% between 1914 and 1924 to around 42,000.⁷³ Thus the late war period saw the formation of new representative bodies and increased membership for existing

⁷¹ Details from MacLeods, 'The Social Relations of Science...', *op.cit.*, p. 333.

⁷² From *Proceedings of the Institute of Chemistry*, 1923, Part 1, p.29. Cited here from MacLeods, *Ibid.*, p. 326.

⁷³ See *Ibid.*, pp. 333-4.

ones, in all the areas in which scientists had made an impact during the war. These bodies enjoyed rising membership during the early 'twenties. The Institution of Professional Civil Servants was formed in 1919 to provide a mirror organisation to the civil service staff associations which represented clerical and administrative staff. By 1921 the IPCS had 3,000 members and this rose to 10,000 by the end of the 1920s. In the universities the Association of University Teachers grew out of the Junior Staffs Associations in December 1917 and soon had over a thousand members. Chemists in industry, who had played perhaps the most conspicuous part in scientific war work, had been agitating for an effective and truly representative national organisation since mid 1915.⁷⁴ Matters came to a head in September 1917 with the beginnings of a new organization, the British Association of Chemists (BAC). The new body was begun by industrial chemists from the Midlands who found that although they had done important war work, yet they were not allowed membership of the foremost national chemical association, the Royal Institute of Chemistry (RIC), because of its strict qualifications requirement.⁷⁵ The BAC was formally inaugurated at a national meeting held at the Manchester School of Technology on 10 November.⁷⁶ Its aims were to obtain admission to the RIC for practising chemists without university degrees and to raise the professional status of the industrial chemist. The RIC agreed to amend its entry requirements, but the BAC registered as a trade union and continued in existence to press further the professional case of industrial chemists. By 1920 it too had around 1,000 members.⁷⁷

In 1917 an Institute of Physics was also formed. This was a more straightforwardly traditional professional organisation and was based on the RIC. It

⁷⁴ See Henry E. Armstrong, 'The Development and Control of Industry by Public Influences', *op.cit.*; C. T. Kingzett, Fellow of the Institute of Chemistry, 'A Plea for A Real Institute of Chemistry', and 'Chemical Societies and Empire Interests', *The Chemical Trade Journal and Chemical Engineer*, Vol. 58, 8 April 1916, pp. 319-20 and Vol. 63, 31 August 1918, pp. 159-60, respectively.

⁷⁵ See 'The British Association of Chemists', report of meeting of Midlands chemists at Birmingham University on 26 September 1918, *Chemical News*, Vol. CXVII (1918), 11 October 1918, pp. 325-7.

⁷⁶ See 'British Association of Chemists: Inaugural Meeting', *The Chemical Trade Journal and Chemical Engineer*, Vol. 61, 17 November 1917, pp. 413-5.

⁷⁷ See Macleods, 'The Contradictions of Professionalism: Scientists, Trade Unionism and the First World War', pp. 1-32, *Social Studies of Science*, Vol. 9, Part 1, (1979), pp. 8-9. See also editorial, 'Current Topics: Organisation of Chemists', *The Chemical Trade Journal and Chemical Engineer*, Vol. 63, 6 July 1918, pp. 1-2.

was incorporated in November 1920 and its first President was Sir Richard Glazebrook, the Director of the National Physical Laboratory.⁷⁸

These organisations were largely concerned with professional questions of social and economic status. With the exception of some small elements of the BAC, the intention was not to form bodies to exert an influence over policy. The goal was to win for marginalised groups of scientists a professional status on a par with the traditional elite scientific groupings. In direct contrast to this, a minority of scientists opted for a self-consciously trade union style organisation: the National Union of Scientific Workers. The name reflected its more militant intentions to exercise influence over policy through trade union style methods, its more left-wing ideological basis, and the fact that its prospective constituency was the junior grades of scientists at government research institutions and the universities. Its early history was however marked by tension within its membership about the nature and scope of its political aims and the related question of whether it should be a professional body or a trade union.⁷⁹

A national union of scientific workers had been suggested as early as July 1914 by Ronald Ross in the editorial columns of his Science Progress.⁸⁰ Ross had long been a campaigner for better pay and prospects for scientists and this suggestion followed his campaign to eliminate the 'sweating' of scientists and a survey of their working conditions undertaken by Science Progress.⁸¹ The organisation did not however get off the ground until developments in Cambridge in May 1917. Following the publication of Seward's collection Science and the Nation, which stressed the primary importance of pure research, a group of researchers under Harold Jeffreys agreed to circulate a letter to university and government laboratory scientists proposing the formation of a Scientific Workers Research Association (SWRA). This circular stated that the body 'would aim at performing a

⁷⁸ See MacLeods, *Ibid.*, p. 9.

⁷⁹ The whole of this section on the NUSW is necessarily heavily dependent on the work of Kay and Roy MacLeod. See Kay MacLeod, 'Politics, Professionalisation and the Organisation of Scientists: the Association of Scientific Workers, 1917-1942' (unpublished Ph.D. thesis, Sussex University, 1976); Roy and Kay MacLeod, 'Contradictions of Professionalism...', *op.cit.*; and also their 'Social Relations of Science...', *op.cit.*

⁸⁰ See Ross, 'Proposed Union of Scientific Workers', Science Progress, Vol. 9 No. 33 (July 1914), pp. 164-5.

⁸¹ See for example, 'Sweating the Scientist' editorial by Ross, Science Progress, Vol. 8 (1913-14), pp. 599-608; on his inquiry into the pay and prospects question see 'The Emoluments of Scientific Workers', a questionnaire which began appearing from late 1913 (see for instance, Science Progress, Vol. 8, p. 598).

somewhat similar function in regard to research in pure science' as the DSIR performed for applied industrial research, though it would be a co-ordinating body only and would not itself undertake research.⁸² After an encouraging response to this circular another meeting was arranged in London at the end of 1917 and scientists from Cambridge, the London colleges, the NPL, Woolwich Arsenal, and the Royal Aircraft Establishment at Farnborough attended. At this meeting the original proposal was rejected in favour of a more radical one by Norman Campbell of the NPL to create a National Union of Scientific Workers, largely with the support of more radical, left-wing scientists from the NPL and Woolwich. A provisional executive was appointed and the first manifesto was circulated to universities and government laboratories in January 1918. This Manifesto asserted that the union would concentrate on representing the economic interests of its members,

...not because scientific workers have no other or more important interests, but because it is by dealing with economic questions that the action of such a union as is contemplated is likely to be the most successful...the first step in obtaining a proper recognition of the vital importance of science in all departments of national life must consist in securing conditions for scientific work which will attract the best brains in the country, and command respect in a community which tends to regard wealth as a measure of worth.⁸³

In so saying, the Manifesto pinpointed what was common to all the schemes of professional and economic organisation that we have examined above. Economic and social status, though important in its own right, was also regarded as another key to help unlock the door of policy influence. As such it was a part of the wider campaign of public science to consolidate the wartime gains of science.

However, the NUSW leadership and some of its membership, desired a much more open campaign to influence policy. These desires were informed by their left-wing ideology. Many of the leaders were socialists and believed that only in a socialist Britain would scientists be able to achieve their deserved influence in national affairs.⁸⁴ But in the social

⁸² The original circular letter was reprinted in *Nature*, 'A Scientific Research Association', Vol. 102, 28 November 1918, pp. 254-5. It seems that the title of the organisation had now been changed to omit the word 'Workers' with its trade union connotations.

⁸³ Association of Scientific Workers Archives, Mss. Franklin Kidd (10/01/18) probably by J.W. Evans, geologist and lecturer in Petrology at Birkbeck College 1906-20 and at Imperial College, 1912-27, early active member of NUSW and President 1919-20. Quoted from Roy and Kay MacLeod, *The Contradictions of Professionalism: Scientists, Trade Unionism and the First World War*, *Social Studies of Science*, Vol. 9 No.1 (1979), pp. 1-32; p. 12

⁸⁴ The first Treasurer, Norman Campbell, and Hyman Levy (member of the Executive 1922-3) were socialists. The Fisheries Inspector and technical adviser Lyster Jameson (member of the 1919-20 Executive), and the Cambridge botanist and editor of *Labour Monthly*, Clemens Dutt (who was one of the first signatories of the original SWRA

and political climate of the early twenties, such an underlying agenda caused great tensions within the union. Many of its members wanted nothing to do with such an ideological agenda or direct political action.⁸⁵ It was partly such unease at the real nature of the organisation which kept its membership throughout the 1920s disappointingly low and led, in 1927, to a change of name and an abandonment of trade union status. The NUSW became the Association of Scientific Workers, and until the 1930s, when it became an important vehicle for socialist scientists like J.D. Bernal, it adopted a more moderate and straightforwardly professional function.

3.2.3 CONSOLIDATING THE CONTROL OF RESEARCH IN THE HANDS OF SCIENTISTS

The other perceived major threat to the position that science had achieved during the war was the problem of lay administrative control of research. This constituted a threat in three related ways. Firstly lay control threatened to negate the direction of science policy by scientists, through the control of research agendas and funding. Secondly it was a threat to the professional status of scientists: if science was to be defined by the State's generalist bureaucrats, then scientists had lost control even of the area of their own specialist professional competence. This posed a much more fundamental third problem. If the content of science was defined by the State, public scientists feared that only applied research would be done. This threatened the continued existence of the scientific method itself, which was believed

circular, and who remained a NUSW member until 1926), were Guild Socialists. Jameson arranged for union meetings to be advertised in the *Guildsman*. The industrial research chemist Alfred Bacharach was a member and Secretary of the Labour Research Department for a short time after the war (to which the union affiliated). J.W. Evans was a Labour Party supporter. The Cambridge biologist Lancelot Hogben, a founder member of the union who sat on its first Provisional Executive, became a radical socialist during the war, and contributed to *The Guildsman*. For Biographical details see MacLeods, 'Contradictions of Professionalism...', *op.cit.*; NUSW, *Annual Reports and Reports of AGM of Council*, (1919-); Werskey, *Visible College*, *op.cit.* Frederick Soddy was also a contributor to *The Guildsman*, and a Labour Party supporter. He stood as the University Labour Club's official candidate in the Aberdeen University Rectorial contest of 1921, losing to the Unionist candidate, Sir Robert Horne. See *The Lord Rector*, magazine of the Aberdeen University Labour Club, No. 1 (19 October 1921) and No. 2 ((November 1921). *Safety First*, the organ of the University Unionist Association, sent him up in a poem as 'the Bolshie scientist/The Labour Party call their King', and warning voters that he was hardly a non-political candidate, as the Labour Club had claimed, since he was more a representative of Labour than a distinguished chemist. See editions of 19 and 26 October 1921, pages 4 and 6 respectively. H.G. Wells was also a member, and the Union's Secretary, Archibald G. Church, was a member of the Labour Party. Wells and Church stood as Labour Party candidates at the 1923 election, specifically to press the claims of public science in Parliament. See Armytage, *op.cit.*, p. 95.

⁸⁵ See for example the reaction of the first President, Oscar Brady, to the 1920 campaign to get representatives of the union onto the ACSIR, which will be discussed below. He thought it smacked of the undue influence of the Labour Party, if not the Guild Socialists. He wrote to the Executive 'expressing his fear that the Union was departing from the non-party attitude it had decided upon at its inception, and asking for a definite statement of policy'. See Brady to Executive, 12 May 1920, Association of Scientific Workers Archives, cited here from Kay Macleod's thesis, *op.cit.*, p. 181.

to reside primarily in pure research, precisely because there were no *a priori* conclusions about results. Although the scientific method was and is largely a mythical construction of the scientific community to serve its own professional and political ends, it was precisely for this reason that public scientists could not allow it to be publicly compromised. As we have noted throughout, this method, and the assumption of its transferability to policy problems, was the very basis of scientists' claims to influence policy. This is why the debate about the control of research was so crucially important. It may seem like a diminution of the earlier calls for influence over general policy, but it was in fact a feature of the success of public science, and an attempt to deal with the concomitant problems of that success.

But there was another reason why the control of research was so important which further explains the moderation of public science's claims for policy influence, and instead this concentration on professional issues. M. D. King has argued that between the wars, scientists faced a 'professional dilemma'.⁸⁶ The existence of a national science policy meant that scientists became increasingly involved in administration. King argues that scientists were now faced for the first time with a tension between their new status and their professional identity. To protect their status they needed influence, at least over science policy. But this influence would threaten their professional identity as objective scientists. I would add to King's argument that this was again a threat to the credibility of the scientific method, and thus, ultimately, to the legitimacy of their claims for policy influence. The result was a further hardening of the resolve of scientists in general, and particularly of public scientists, to focus on more narrow professional concerns. Wider influence over general policy would too clearly call into question their professional identity, and it became, along with too obvious political affiliation, a highly controversial and potentially divisive issue. Even in the debate about the control of research, scientists were, in fact, caught in a cleft stick. They had to have control to protect their professional status, their access to channels of policy influence, and the very

⁸⁶ M.D. King 'Science and the Professional Dilemma', pp.34-73 in J. Gould (ed.), Penguin Social Sciences Survey 1968, (Harmondsworth, 1968)

ideological basis of these claims: the scientific method. But control brought immersion in administrative tasks and political decisions, which were themselves a threat to the objectivity of science, the basis of their claim to power.

The debate about lay control of science policy had two levels. First there was the issue of whether generalist politicians and civil servants were fit persons to make broad science policy. This resulted in familiar criticisms of the shortcomings of party politicians, and calls for reform of the educational curriculum and the structure of the Civil Service to incorporate expertise in science. The focus was on ensuring that government policy for science contained adequate provision for pure as well as applied research. This new focus was essentially a question of professional autonomy. For the scientists, applied research was a cipher for the subordination of scientific to lay authority. Pure research was a cipher for the control of research by scientists. Criticisms of lay control of research priorities were centred on, as one would expect, the activities of the DSIR, the main source of government funded, mainly civilian research. On the more micro level, there was criticism in the lay administration of applied research in government departments, of which the passing of the National Physical Laboratory from the control of the Royal Society to that of the DSIR in 1920 was an example. The proposed solutions to the problems of both policy and administration were a civil service with more scientists in it; control of government scientific departments by scientists, and some kind of advisory scientific body, representative of the wider scientific community, not just the elite societies, to help direct research. Calls for scientific influence over more general policy issues continued in the background but were no longer the chief public concerns of either the Reformist or the Radical branches of public science.

Richard Gregory combined these criticisms of policy and administration as early as 1919 in an essay in Nature on 'The Promotion of Research'.⁸⁷ After charting the rise of government science policy in terms of funding, he noted that the tendency of governments was to foster applied science, and argued that pure research 'on the borderlands of science' had led to the discoveries which had been of most

⁸⁷ Gregory, 'The Promotion of Research', one of a number of essays on current themes for Nature's Fiftieth Jubilee Issue, 6 November 1919, Vol. 104, pp. 259-61.

commercial and industrial use. Scientists, he argued, should not only be provided with 'full facilities', but should also be granted:

freedom to follow what seem to them the most promising paths of investigation. A scientific research laboratory cannot be conducted on the lines of a business house in which each department has to justify its existence by profitable returns. It must be independent of its patron, whether this be represented by a State department or by a governing body of commercial men.

Gregory continued, borrowing an exaggerated illustration from President Maclaurin of the Massachusetts Institute of Technology, which still resonates today:

The superintendent of buildings and grounds, or other competent authority, calls upon Mr. Newton.

Superintendent: Your theory of gravitation is hanging fire unduly. The director insists upon a finished report, filed in his office by 9 a.m. Monday next; summarised on one page; typewritten, and the main points underlined. Also a careful estimate of the cost per student-hour.

Newton: But there is one difficulty which has been puzzling me for fourteen years, and I am not quite...

Superintendent: (with snap and vigour). Guess you had better overcome that difficulty by Monday morning or quit.⁸⁸

The scientific community's fears about lay administrative control of research crystallised in early 1920 around the appointment of the non-scientific American R.L. Frink as director of the Glass Research Association of the DSIR. The first shot seems to have been fired in a letter to Nature from the chemist, Morris William Travers.⁸⁹ He attacked Frink for having only practical experience of the glass industry and no experience of scientific research, and argued that he was thus unqualified for his new post. Travers' more general point was about science's loss of control of research in the modern state to lay bureaucrats. He argued that it was time scientists were more aware of developments and made some response:

It has not been sufficiently clearly realised that scientific and industrial research is passing out of the control of the recognised scientific and technical societies and institutions and of the universities into the hands of the Department of Scientific and Industrial Research, and, in accordance with

⁸⁸ All quotations above from Ibid. p.261.

⁸⁹ 1872-1961, chemist and biographer of Sir William Ramsay (1956).

government policy, the secretary of this Department [Frank Heath] is an administrator without practical knowledge of science, industry, or research. The associations which are formed under the aegis of the Department are governed by councils upon which organised science is unrepresented....As the Department controls funds for research which are vastly greater than those at the disposal of the Royal Society and all the other societies and universities put together, the outlook for science is a poor one unless scientific men are prepared to take united action with the view of securing a proper share in the control of research.⁹⁰

During the early months of 1920, the debate about the control of research widened. Government plans to re-organise the organisation of scientific research in India sparked a long running controversy in the editorial and letters columns of Nature. It was feared that the report of the Indian Industrial Commission, presided over by Sir Thomas Holland, formerly Director of the Geological Survey of India, would be accepted as the basis for future policy. This strongly advocated centralisation of research under a new Imperial Department of Industries of the Government of India, with the different sciences formed into water-tight units under an administrative head. Nature supported the old de-centralised system of research in which 'the man is everything' and asserted that:

For original scientific investigators little or no official control is needed, and they should not be constantly called upon to furnish interim reports and programmes of work to an official chief, or to obtain his formal sanction before undertaking an investigation or publishing the results of their work. Such formalities waste valuable time, lead to constant friction, and are contrary to the spirit which should reign in all centres of creative scientific research.⁹¹

In a letter replying to this editorial Frederick Soddy put his finger on the reason why Indian scientific research was such a burning issue to the British scientific community:

The proposals to centralise under the control of a few official departmental heads the body of actual scientific investigators in India, thus creating a few highly paid administrative posts for senior men and effectually killing all initiative, enthusiasm, and liberty of action on the part of those actually carrying on the investigations, is perfectly in accord with what has happened in this country since, in evil day, the Government assumed the control of scientific and industrial research.

⁹⁰ M.W. Travers, letter to Nature, 'the Control of Scientific and Industrial Research', pp. 597-8, Nature, Vol. 104, 5 February 1920. Quotation from p. 598.

⁹¹ Nature, unsigned leading editorial, 'The Organisation of Scientific Work in India', pp. 653-4, Vol. 104, 19 February 1920. Quotation from p. 654.

Both the DSIR and the Indian proposals, Soddy feared, meant that research was to be controlled by know-nothing bureaucrats. This was the original problem which scientists had hoped the establishment of the DSIR would correct:

The men who do the work...are to be deprived even of what little satisfaction and independence genuine scientific work for its own sake affords, and are to be put under the men against whose incompetence and lack of knowledge the whole uproar originally arose....under men who brought an Empire, as rich in scientific talent and genius as any, perilously low. [i.e. during the early part of the war].⁹²

Soddy spoke with the voice of the Radical section of public scientists: he was a leading member of the NUSW. Mixed in with the fear of lay control was a desire for radical trade union-style action by scientists to protect the scientific worker not only from lay control but from exclusion from influence on 'national life' by the traditional scientific elite. Soddy criticised the effete traditional scientific societies for their inaction and urged 'combined energetic action' from 'the rank and file of research workers throughout the Empire'. There was here an undertone of guild socialism: the control of industry by its workers. The NUSW sent protesting letters to the Glass Research Association and to the DSIR over the Frink appointment, and sent two, unsuccessful, deputations, one to Balfour as Lord President of the Privy Council, still the nominal head of the DSIR, and one to Heath. The former refused even to see them.

It was one of the Union's stated aims to ensure that all government scientific and technical departments were under the direct control of scientists. Its official response to the Frink case was expressed in a letter to Nature from its Secretary, Major A.G. Church. The union stood against recent trends to bring businessmen into government, and for expert control of science policy:

It is the opinion of the National Union of Scientific Workers that it is the subordination of the scientific worker to the "business man" which has been chiefly responsible in the past for the tardy development of scientific industry in this country. It feels that this appointment negatives the aims outlined by the Department, and that the whole industry will suffer from the consequent neglect of the scientific aspects of glass research work and from the unwillingness of scientific workers to submit to such direction.⁹³

⁹² Soddy, letter to Nature, 'Organisation of Scientific Work', Vol. 104, 26 February 1920, p.691.

⁹³ Letter to Nature from A.G. Church, 'Scientific Direction of Industrial Research', pp. 40-1, Vol. 105, 11 March 1920, p.41.

At an NUSW public meeting on 28 April chaired by H.G. Wells, Soddy attacked both the running of the Research Associations and the DSIR. The money allocated by the DSIR to the Research Associations was in the form of a capital grant, over which Parliament had no jurisdiction. It was used to fund secretive bodies which served neither the public nor science, but only the private monopolies of a capitalist industry. Soddy demanded that representatives both of trained scientific workers and of organised labour should be included in the councils and executive committees of the research associations. He also urged that the Advisory Council of the DSIR should contain NUSW representatives, rather than other scientific members, and that it should become the controlling body of the Department.⁹⁴ This debate was continued at the annual general meeting of the union in November. Soddy repeated his proposals and a member of the Executive, Alan Arnold Griffith, suggested that the Advisory Council be reconstituted as a new body, 'one half of which is nominated by the Government...and the other half elected by the Trade Unions representative of Scientific workers'. He added that no resolution of the new Council should be valid unless it got a majority 'on each side of the council'. The details of this scheme were left to be drawn up more fully by the union's Research Committee.⁹⁵ However such moves seem to have caused division within the ranks of the NUSW. Some members disliked a strategy which was so openly politically motivated and associated with the politics of labour, and the proposal seems to have been quietly dropped.⁹⁶

Meanwhile the Reformist public scientists had made their own contribution to the debate about the control of research. An anonymous leading editorial in May had suggested that the Royal Society's Conjoint Board of Scientific Societies be used as a 'liaison officer' between the DSIR and the scientific societies, and should share decisions about what research was to be done with the ACSIR. This was a less radical and more emollient suggestion than the NUSW's, but it was meant to answer the same perceived problem. It was a way of giving the wider scientific community

⁹⁴ Report of NUSW meeting at Birkbeck College, London, 28 April 1920. Soddy spoke on 'The Public Support of Scientific Research'. *Nature*, Vol. 105, 6 May 1920, pp. 309-10.

⁹⁵ See *NUSW Annual Report (Including Report of AGM of Council)*, AGM held on 13 November 1920, p. 54.

⁹⁶ See Kay MacLeod, 'Politics, Professionalisation and the Organisation of Scientists...', *op.cit.*, pp.180-1.

(and not just the eminent Fellows of the Royal Society who made up the ACSIR) more control over science policy. It was emollient because it worked within the terms of the Royal Society model for the organisation of science, which was identified in the previous chapter. Thus though it asked the DSIR to make the Board part of its administrative machinery, it was to serve in a 'consultative capacity, without...any executive functions'.⁹⁷ Another contribution from Nature was a suggestion for Civil Service reform to give more power to scientists. An editorial probably written by Gregory himself, complained that while in industry and commerce the technical expert was respected, in government departments the technical staffs had too little or authority, while the clerical staff had too much of both. The expert in government had:

been relegated to a position in which his every purpose is rendered more or less ineffectual...[and]....in which the exercise of his legitimate activities is barely tolerated by those occupying the clerical or controlling positions.⁹⁸

The editorial stressed that it was time that:

...the modern technical expert...be assigned his place of precedence there, and at the same time...have the scope of his authority and the dignity of his status definitely determined and unequivocally declared.⁹⁹

The editorial ended calling again for the reform of the civil service. It criticised the 'privileged class' of those in the top administrative grade, and demanded that they should serve their time in departments at a lower executive level, learning their trade, before being promoted into the administrative grade and control of that department. Such a reform would have led to more members of the technical staff being in administrative control of technical departments. Thus the argument here was not only about status, but also about access to policy influence.

This point was confirmed in two letters to Nature in April which were prompted by this editorial. The writer of the first argued that experts in the Civil Service, who were there primarily to advise the government on the basis of their expertise, should not be insulated from the Minister by more senior Civil Servants

⁹⁷ See 'The Federation of Science', unsigned leader, Nature, Vol. 105, 13 May 1920, pp. 317-8.

⁹⁸ See the first page of the leading editorial 'Knowledge and Power', Nature, Vol. 105, 25 March 1920, pp.93-5.

⁹⁹ Ibid.

who were generalist. Rather there should be a separate organisation for policy advice, and administration of that policy:

Somehow or other an advisory side for formulating policy ought to be organised on different lines from those of the administrative side which carries out the policy. But if there is a separate organisation on the technical side it ought to have direct access to the Minister finally responsible, and not be fenced off from him by a secretariat trained on different lines. There are sure to be misunderstandings and ultimate despair if all the work of a professional technical staff has to pass upwards and downwards through the refracting and distorting medium of an inexperienced secretariat. The scheme of organisation must be in sectors reaching continuously from the Ministerial centre to the circle of recruitment. The technical staff itself will want the assistance of 'civil servants' content to follow out the policy which is indicated. The mischief begins when the Civil Service forms a complete belt in the inner regions of the organisation. In that case an inexperienced Minister is completely surrounded by inexperienced advisers, and then power is cut off from knowledge.¹⁰⁰

The second letter, from J. W. Evans, a member of the NUSW, heartily agreed with the original editorial stating that:

It rightly emphasises the need that the ultimate administrative authority should be vested in men with technical knowledge and experience, and not in Civil Service officials appointed originally...on the basis of purely literary attainments.¹⁰¹

This letter continued, arguing that the only way that this end could be achieved was by ensuring that scientists enjoyed pay and prospects commensurate with the importance of their work. The only way that this importance would be realised was via a 'propaganda' campaign to educate the public. Such a campaign, as we have seen, was indeed being undertaken specifically for this ultimate purpose of ensuring that scientists wielded authority in matters of policy.

3.2 REFORMISTS AND RADICALS: POLITICAL IDEOLOGIES AND THE MEANS TO POWER.

The themes of public science after the war and in the 'twenties discussed in detail above, were common to the whole community of public science, and were informed by the common context of contemporary concerns. However, as already indicated, by the end of the war two groupings were beginning to emerge within the scientific community: Reformists and Radicals. These, as yet loose, groupings are identifiable not through any differences in their rhetorical themes, but only in the political agendas which their rhetoric

¹⁰⁰ 'Knowledge and Power', letter to Nature, from 'F.O.I.', Vol. 105, 8 April 1920, p. 165.

¹⁰¹ Letter to Nature from J.W. Evans, Ibid.

supported. Reformists sought a gradual accumulation of power within the existing political system; Radicals sought a socialist revolution and new technocratic forms of government. Most of the old Nature/BSG camp were Reformists, and the Radicals were epitomised by the nucleus of the NUSW and individuals closely linked to it like Soddy and Levy. While the arguments of the Reformists began to run out of steam during the mid to late 'twenties (having seen most of their gradualist demands satisfied by the retention of the new wartime system for the organisation of science), the Radicals were just finding their voice. It was as if, with their more radical demands, they still had something to say; something to campaign for. Thus the BSG, as was noted, became increasingly unsure of the relevance of its continuing mission. This was reflected in a drop-off in its membership and in available funds, inspite of several attempts to re-invent itself in the 'twenties.¹⁰²

In September 1920, Soddy railed against the reluctance of the BAAS to take the lead in questions of the social relations of science, as Lockyer had done in 1903. Soddy here took the view that science was generally perceived to be the only force which could save society from war and economic depression. He argued that, 'the vast body of the general public, disillusioned by the war, looks to ...[scientific men] to provide a way of escape from the evils that threaten our civilisation'.¹⁰³ The BAAS, he complained, gave the public no sense that the scientific community realised, 'the position science now holds in the community', and was making 'no attempt...to take the position already conceded by the general public to the spirit and service of science as almost the only disinterested and effective agency in a cannibalistic and corrupt society'.¹⁰⁴ Soddy was clear that rather than just being an opportunity to advance the claims of a few new research proposals for public money, and to see a new city, the function of the Association should be the 'public application of science':

This scientific synthesis and the direction of the unique mental attitude, induced only by the actual discovery of new knowledge, to the conduct of public affairs are the real and peculiar functions of the Association if it is to regain its national position.¹⁰⁵

¹⁰² See the Guild's Journal, for this period. A useful account is also contained in MacLeod, 'Science for Imperial Efficiency...', op.cit., pp. 176-82.

¹⁰³ Frederick Soddy, p. 111, letter to Nature, Vol. 106, 23 September 1920, p. 111-2.

¹⁰⁴ Ibid.

¹⁰⁵ Ibid., p. 112.

Soddy was also clear about the scope of the power scientists should enjoy. The new organisation of science was not enough. Here non-scientists were in control: 'The public, if not scientific men, know that scientific government is inconceivable without scientific men at the head of affairs'.¹⁰⁶ As Soddy went on to say:

It is not too much to say that whole fields of government in the real sense, which is not the conventional sense of party politics, now fall wholly within the ascertained realm of science. A remark of Mr. H.G. Wells from his Outline of History concerning ethnologists, geographers, and sociologists may be generalised. All the monstrous turmoil and waste, the wonderful attitudes, deeds and schemes of the 'great men' deemed famous by the unscientific historian, might very well be avoided if Europe had the sense to instruct a small body of ordinarily honest scientific men to take over the work.¹⁰⁷

The comparison with Lockyer here is informative. The Radicals were now beginning to define a new public science, just as he had done in 1903. A new period of public science was commencing, though this time the inspiration was more socialist than social-imperialist. This development was made even more explicit in a letter to Nature from the NUSW executive endorsing Soddy's criticisms of the BAAS, in mid-November. The letter summoned up the ghost of T.H. Huxley, arguing that such a clear public science cause as he had championed was again needed now. It is interesting to observe that here, talking amongst themselves in the letter columns of Nature, the scientists (unlike most recent historians) understood clearly that science, as a social activity, had long produced a rhetoric aimed at winning it social and cultural authority. If science was to win for itself a place in the public estimation such as it had enjoyed in the last century under Huxley, it had to have a challenging new theme suited to the changed contemporary concerns. The BAAS and other bodies representing organised science had to:

...come out with a new message which, like that of Huxley and his contemporaries, challenges old-established points of view....While Huxley's message forced people to revise their old-established ideas and prejudices as to man in his relations to his natural environment, the public is now ripe for a lead from science in the direction of a fundamental revision of that part of its outlook on life which concerns the relations of man to the social and economic environment which he has created.¹⁰⁸

Radical public scientists wanted the formalised and centralised political power to control and direct the social uses of science along a liberal, pacific path. They also felt that only

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

¹⁰⁸ Letter to Nature from leading members of the NUSW executive (J.W. Evans, President; H. Lyster Jameson, member of executive; and A.G. Church, Secretary), Vol. 106, 18 November 1920, p. 373.

scientists could devise the new mechanisms of governance necessary. As members of the NUSW executive spelt out in a letter to Nature, at the end of July 1921:

How can scientific workers collectively obtain such control of the product of their work - new knowledge - as to secure that it shall be used for the development of a better order of society out of the existing chaos? Science - knowledge - alone can create this new order and save Europe from relapsing into barbarism.¹⁰⁹

Soddy himself was soon to go even further in providing a justification for scientific technocracy. While other Radicals argued that the scientific method was the only remaining guarantee of both certainty and morality, Soddy argued that the content, as well as the method of science made it uniquely qualified to make policy. In a series of lectures criticising the prevailing economic system as wasteful of the potential material benefits to society which science could generate by perverting science into mutual destruction, he equated wealth with energy, and concluded that the same scientific laws governed both.¹¹⁰

However, during the 'twenties, the Radicals stopped short of publicly demanding the kind of scientific technocracy they clearly desired. As was noted above, such a radical political aim was mistrusted, and thus divisive, in the context of widespread scientific apathy and conservatism, partly caused, as we observed, by a narrower, introspective focus on consolidating wartime gains. It was not until the changed circumstances of the 'thirties, when socialism was receiving a better press, that Soddy, for instance, felt free openly to demand government by scientists. In 1935 he argued that it was time for the public to acknowledge that science was the real master in modern society, and to: '...insist on being

¹⁰⁹ 'Science and Civilisation', letter to Nature, from NUSW executive (this time signed by J. Henderson Smith, Chairman of the executive and Church), Vol. 107, 28 July 1921, p. 684.

¹¹⁰ Two lectures were given to the Students' Union of Birkbeck College and the London School of Economics on 10 and 17 November 1921. These were published as, Cartesian Economics: the Bearing of Physical Science upon State Stewardship, (London, Hendersons, 1922). The arguments were then developed in a lecture at Guild House on 29 November 1923 entitled, and published as, The Inversion of Science: and a Scheme of Scientific Reformation, (London, Hendersons, 1924). See also the report of these in Nature, Vol. 112, 8 December 1923, p. 839. There is currently no good biography of Soddy (although one is in the final stages of preparation from Linda Merricks of Sussex University). The following are of use: Soddy, Science and Life: Aberdeen Addresses, (London, John Murray, 1920); A. Fleck, 'Frederick Soddy', Biographical Memoirs of Fellows of the Royal Society, Vol. 3, (1957), pp. 203-16; Muriel Howorth, Pioneer Research on the Atom: the Life Story of Frederick Soddy, (London, New World Publications, 1958); M.I. Freedman, 'Frederick Soddy and the Practical Significance of Radioactive Matter', British Journal for the History of Science, Vol. 12 (1979), pp. 257-60; T.J. Trenn, 'The Central Role of Energy in Soddy's Holistic and Critical Approach to Nuclear Science, Economics and Social Responsibility', Ibid., pp. 261-76; A.D. Cruickshank, 'Soddy at Oxford', Ibid., pp. 277-88; Kenneth R. Page, 'Frederick Soddy: the Aberdeen Interlude', op.cit., (1979); George B. Kauffman (ed), Frederick Soddy (1877-1956), (Dordrecht, Reidel, 1986); M. Davies, 'Frederick Soddy: the Scientist as Prophet', Annals of Science, Vol. 49, No. 4 (July 1992), pp. 351-67.

ruled not by the reflection of a reflection [traditional politicians], but direct by those who are concerned with the creation of its wealth rather than of its debts'.¹¹¹

The Reformists were also calling for a new message to inspire public science in the early 'twenties. Such calls played on the same rhetorical themes as those of the Radicals, but supported a much less extreme political goal. Gregory was the leading exponent of the Reformist rhetoric in the early 'twenties. He shared the Radicals' distrust of the existing democratic constitution, believing with them that it would pervert the course of scientific discovery and make the world 'a place of dust and ashes'.¹¹² However, though Gregory called for scientific men to 'exert direct influence in the State',¹¹³ he did not want them to become any more concerned with politics than they already were. Instead he called for a new breed of public scientist to broadcast the importance of science to the nation. He argued that: 'Science needs champions and advocates in addition to actual makers of new knowledge and exponents of it'.¹¹⁴ He called for lesser members of local scientific societies to become these new 'Sir Galahads' or 'knights of science', and to turn the societies into a national network of pressure groups publicly urging the national importance of science. This strategy was echoed in the new campaign of the BSG in 1921-2, which, as has already been noted above, sought to extend the Guild into the provinces.¹¹⁵ However, Gregory himself seems to have been confused as to the exact role of these new champions of science. In a leading editorial in Nature, in December 1922, which was also an advertisement for the Guild's new campaign, he repeated his call for scientific champions. However, he now made it clear that these were not to be scientists (who should not 'seek to get into the limelight or take part in the turmoil of politics', being, 'much better employed in the laboratory than in Parliament') but non-scientists:

What are wanted...are advocates of science and scientific method - men and women who know the disinterested spirit in which purely scientific enquiries are carried on and desire to introduce into social and political discussions the same impartial attitude towards evidence and fearless judgement upon it.¹¹⁶

¹¹¹ Soddy, p. 24, 'Foreword' to The Frustration of Science, (1935). Cited here as reproduced in G.B. Kauffman (ed), Frederick Soddy (1877-1956), *op.cit.*, pp. 23-4.

¹¹² Gregory, p. 533, 'The Message of Science', abridged version of Presidential Address delivered to the Conference of Delegates of Corresponding Societies of the BAAS at Edinburgh, 8 September, as reproduced in Nature, Vol. 108, 22 December 1921, pp. 533-7.

¹¹³ Gregory, in an address to the Cambridge branch of the NUSW on 16 November entitled 'Scientific Men as Citizens'. See the report in Nature, *Ibid.*, p.415 (24 November 1921).

¹¹⁴ Gregory, 'The Message of Science', *op.cit.*, p. 534.

¹¹⁵ See the Guild's Journal, Nos. 14 (October 1921), and 15 (May 1922) *passim*.

¹¹⁶ Gregory, p. 798, leading editorial 'Science and the Empire', Nature, Vol. 110. 16 December 1922, pp. 797-8.

All the mission of these new champions amounted to was a publicity campaign for science. It was in this spirit that Gregory welcomed the election of Church, the NUSW Secretary, as Member of Parliament for Leyton in 1923. He was: 'exactly the type which we want to have, a man of affairs who would represent scientific workers, with knowledge himself of scientific work'.¹¹⁷

The Reformists, then, seemed uncertain of exactly what they wanted in the early 'twenties. A possible explanation for their confusion is suggested by Werskey in his work on the 'thirties. In this period the Reformists were very concerned about the control of research by the State, particularly in the light of the use of science by the German State. What we may be observing in the early 'twenties are the roots of this position. All public scientists, both Reformist and Radical, were concerned that scientists should control research, both to protect science as a profession and to keep open the new channels to policy-making (gained during the war), but also to protect society from the misuse of science. But how best to achieve this goal? By the early 'twenties the Reformists, who were not motivated by a revolutionary political agenda, believed it was unwise to get any closer to the State, lest this hand the State further opportunities for controlling science. In essence, the Reformists, with their moderate ideological motivation, were caught in M.D. King's professional dilemma. The Radicals, on the other hand, motivated by a more extreme and socialist ideological position, wanted a scientific technocracy for exactly the same reasons. Only scientists could protect science and thus guide society along the right path.

3.3 CONCLUSION

Public science spent much of the post-war period dealing with the consequences of the war. Firstly there were the implications of the Royal Society model for influence over policy-making, now generally accepted by scientists and the State as their new relationship. If State bodies were to organise science then there was the possibility of State interference in the content and nature of science. Thus one of the main themes in public science became the control of research. Similarly a product of the war was the popular association of science with destructive ends. This perception of public concern was strengthened by the unease that many scientists themselves felt at their role in the war. Thus another theme was

¹¹⁷ Gregory in an address to the NUSW in 1923, cited from Armytage, *op.cit.*, p. 96.

rehabilitating the public image of science: associating it with the new popular desire for the arts of Peace. Wartime experiences had also had a further influence: they had inculcated a sense of solidarity in the scientific community. This expressed itself in the establishment of new professional and trades union bodies to protect and advance wartime gains in the area of pay and prospects.

These wartime legacies preoccupied public science in the 'twenties and it might seem that the question of policy influence was edged into the background. However, I argue that these new concerns were all fundamentally linked to this central aim. The wartime gains of science had to be first consolidated by deflecting these possible problems, before any further headway could be made in terms of policy influence. Furthermore these post-war problems (combined with the political atmosphere of retrenchment and cautious reaction) tended to engender a sense of political apathy in the scientific community as a whole. In this climate it was difficult to press for increased influence, even if there had not been other concerns.

However, as well as the common rhetoric of consolidation of wartime gains in policy influence, the post-war years were also marked by the beginnings of a bifurcation of the rhetoric of public science along ideological lines on the question of the most effective way to protect scientists' new position. Reformists wanted to follow the implications of the Royal society model of using existing (or easily integratable new) institutional mechanisms to protect and add to the power they enjoyed. In this sense they had acquired a new awareness of what kind of power was politically possible, given the culture of the British State towards outside expertise. Radicals shared the same fears and much of the same rhetoric, but were prepared to continue campaigns for a scientific technocracy as the best way to protect both science and society. They were still as politically naive about what was possible as Edwardian scientists had been. Thus by the early 'twenties the Radicals appear to be the inheritors of Lockyer's vision of an executive national council of science, although their public science arguments now supported a very different ideological version of the national good. It was this new socialist version, informed by wartime experiences, which was to dominate public science until after the Second World War, although the roots of Polyani's reaction to it can also be identified in the fears of the Reformists.¹¹⁸

¹¹⁸ On later developments see, Werskey, *Visible College*, *op.cit.*, *passim*; Rose and Rose, *Science and Society*, *op.cit.*, especially pp. 54-7; and Roy and Kay MacLeod, 'The Social Relations of Science and Technology 1914-1939', *op.cit.*, especially pp. 341-54.

CHAPTER FOUR

FOOD FOR THOUGHT?: PUBLIC SCIENCE AND THE RELATIONS BETWEEN THE ROYAL SOCIETY FOOD COMMITTEES AND GOVERNMENT DURING THE FIRST WORLD WAR ¹

The previous three chapters have charted in detail the evolution of public science arguments within the natural scientific community from the Edwardian period into the mid twenties. They have demonstrated that such arguments changed over time as they were informed, and sought to utilise, changing public concerns. Such arguments were also modified, as was illustrated, to take account of the gradually increasing degree of influence accorded to outside scientific expertise in the policy process, and the means by which this was accomplished. We noted that what became the dominant Royal Society model of influence pushed for formalisation as far as was acceptable to the Society, and politically possible given the attitude of the State towards policy-influence for outside experts. After this point informal channels were resorted to to obtain even more influence. But how did the desire for input into policy, expressed in those public science arguments, influence individual scientists in their (increasingly frequent) dealings with the State? This chapter is intended to answer this question and presents a case study of scientists' (and one economist's) use of public science in context. In it I will examine chronologically the course of the relationship between the various incarnations of the Food Committee of the Royal Society and central government during the First World War.

The War suggests itself as the key moment in my period to examine the relations between outside experts and government because, as was noted above, it provided scientists with many new channels of access to government. The area of food policy forms a particularly neglected area in these, under-researched, relations between experts and government in wartime Britain.² Although various studies have examined food policy, and some have examined the role of the Royal Society committees, none has explored what the

¹ As well as, of course, acknowledging the help of my supervisors in writing this chapter, I would also like to thank David Smith, Wellcome Lecturer in the History of Medicine, Aberdeen University, whose comments on an early draft were particularly useful.

² See Chapter Two, footnote 2 for a list of some of the most recent literature in this area, and its shortcomings.

aims of the scientists themselves were in becoming involved in government policy.³ Furthermore, it is particularly worth studying as no institutional mechanisms for a government controlled domestic food policy existed before the war. As Beveridge later pointed out the 'War Book' contained only one measure on food: a requirement on Employment Exchange managers to communicate information on the prices of a range of basic goods to the Board of Trade.⁴ This lack of institutional precedent, and (thus) of vested departmental interests, added to the fact that the concerns of food policy were easily presentable as essentially based on scientific considerations, made this an area in which scientists could legitimately hope to manoeuvre themselves into positions of influence over policy. Accordingly, in this chapter I will demonstrate that in relations with the Board of Trade, the Ministry of Food and the War Cabinet (through Lloyd George's Secretariat) the group of eminent scientists involved continually pressed for a formalisation of the relationship of their committee with government.

But it was not just scientists who were involved in such moves. The Food committees of the Royal Society, as well as including many of the foremost contemporary physiologists and some agriculturalists, also included an eminent economist: William James Ashley. Ashley was then Professor of Commerce at Birmingham, but was primarily an economic historian. Educated at Oxford in history, he had been greatly influenced by Arnold Toynbee, and though not a socialist, he retained a lifelong commitment to social reform and the perfection of State institutions by which to achieve it. For Ashley, the professional economist defined himself by his actions in the public domain, and he saw the war as the opportunity to achieve meaningful influence. As such Ashley presents a contrast with the dominant Marshallian School of British economics, which, as will be explored in detail in chapter five, was coming to define the role of the professional economist (at least in the short term) as one actively distanced from public entanglements with policy issues. Ashley, like the scientists, openly propounded a positive public science, and in his activities with the food committees he will be

³ The existing secondary literature on experts and government food policy largely consists of L. Margaret Barnett, *British Food Policy During the First World War*, (Boston, George Allen and Unwin, 1985); M. Teich, 'Scientists and Food Policy in Britain and Germany', 1992, to be included in a forthcoming collection, (I am indebted to the author for an advance copy); and J. G. Stark, 'British Food Policy and Diet in World War One', (London School of Economics, Unpublished Ph.D. thesis, 1984). There is also Jose Harris' 'Bureaucrats and Businessmen in British Food Control, 1916-19', in K. Burk (ed.) *War and the State*, (London, George Allen and Unwin, 1982). But, as the title suggests, this assumes there are only two types of players jockeying for influence over food policy.

⁴ W.H. Beveridge, *British Food Control*, (London, OUP, 1928), p. 5.

seen to argue with the scientists for formalised influence over policy. This, then, is a further reason for concentrating on the food committees: they show that it was not only scientists, but also a certain type of economist, who were pressing for formalisation. As such this case-study also forms a bridge between the two expert groups considered in this thesis.

As David Smith has recently indicated, members of the food committees were aware that the war-time emergency could mean an enhanced long-term role for them in government.⁵ I would want to add that they, in common with the other scientists we examined in the previous chapter, wanted to take advantage of the wartime premium on scientific knowledge to formalise their role in the policy-making process itself. The leading members strove to get their food committee officially recognised as the scientific advisory body to government on all food questions, with formalised linkages and channels of, not only advice, but real scientific input into policy. William Bate Hardy, the Biological Secretary of the Royal Society, who co-ordinated the work of the various food committees, gave clear indication of this aim when he wrote to a member of the committee in 1916. He was keen to ensure that although reports might have multiple authors, the various sections did not disagree, lest this diffuse the impact of expert advice, giving politicians and civil servants reason to ignore it, and diminishing the authority of the scientist:

The Royal Society comes in as a body of specialists to fix the fundamental scientific data. They may be in doubt...but for the benefit of the politician and permanent official, they should have either drawn up one set of analyses, which in their opinion, was the best, or have given reasons for permitting both to appear. It is so important that the prestige of the scientific man should not suffer at this juncture.⁶

In attempting to gain formalised policy influence, the leading members of the food committees deployed classic public science arguments. As ever, the basic premiss was that scientific method was transferable to social and economic problems. So much so in fact that all problems of government policy were essentially scientific, and thus amenable to solution only by scientists. Thus government was criticised for viewing food as an essentially economic problem, to do with supply and distribution, instead of as a scientific problem to do with basic dietary requirements. It was argued that food policy should be based on scientific

⁵ David Smith, 'Nutrition Science and the Two World Wars', paper presented to Nutrition Conference of the Scottish Society for the History of Medicine, Strathclyde University, 2-3 April 1993. I am grateful to the author for permission to cite this work, and to use the following quotation.

⁶ Hardy to D. N. Paton, 10 August 1916, RSA Ms. 505. Cited in *Ibid.*, p.1

principles drawn from a statistical estimation of the calories required to maintain workers at optimum levels of output. In describing in 1919 what he perceived as the gradual rise to policy influence of the Food (War) Committee, the physiologist and second chairman of the Committee, E. H. Starling rehearsed the characteristic public science position that 'England hates the expert'⁷. As early as December 1914⁸, the Germans had learned to heed scientific advice:

But it is not surprising that in this country, imbued in its government departments with a contempt for science and the expert...at the beginning of the war the possibility of a food shortage and the necessity of taking scientific measures to cope with it hardly entered into the consciousness of our administrators.⁹

This contempt for the scientific attitude had meant that it was not until the war that the country had awoken,

to the fact that the feeding of the nation as a mass was a physiological question, [as opposed to an economic one] and that any efforts in this direction would be ineffectual or even disastrous unless they were based on physiological principles.¹⁰

Thus the food committees' reports and memoranda show an overwhelming concern to recommend general policy. Rather than merely giving advice on the scientific pros and cons of different policies, and leaving the choice deferentially to the generalist politician, the committees wanted to make food policy.

I will further illustrate that as well as such direct attempts to influence high policy through these bodies, and to be formally recognised as the source of scientific food policy, the Royal Society Food Committees also drew on a much wider network of informal government contacts and channels to get their policy recommendations implemented.

After a brief examination of the founding of the food committees, I will concentrate on illustrating public science arguments at work in the stormy relationship between the Food

⁷ This is a truncation of the Victorian educationalist, Michael E. Sadler's comment that 'England, at heart, hates the expert; Germany rejoices in him.', from 'The Unrest in Secondary Education in Germany and Elsewhere' in Special Reports on Educational Subjects, Vol.9, (1902), p.50. Cited in G.Harries-Jenkins, The Army in Victorian Society, (London, Routledge and Kegan Paul, 1977), p.155.

⁸ Starling was here referring to the Eltzbacher Report, of which more later, which was published in December 1914, interestingly by an independent group of German scientists.

⁹ Starling, op.cit., pp. 5-6.

¹⁰ Ibid., p.3.

(War) Committee (FWC) and the first Food Controller, Lord Devonport. I will then look more briefly at the perceived more satisfactory relations with the second incumbent, Lord Rhondda. The focus will necessarily be on the rhetoric of public science, but before concluding, I will attempt to give an indication of the actual degree of influence over food policy achieved in a separate section.

4.1 ESTABLISHMENT AND EARLY HISTORY OF THE FOOD COMMITTEES

As we noted in chapter two, the Council of the Royal Society had appointed a War Committee to oversee wartime scientific advice to government on 5 November 1914. Between then and May 1915, four sub-committees were established, but none dealt specifically with food problems. However, when in June 1915 the Council abolished the War Committee and established itself as the Royal Society (War) Committee with new sectional committees under it, one of these was concerned with Physiology.¹¹ This Sectional Committee on Physiology, also known as the Physiology (War) Committee (PWC), established sub-committees on the German and United Kingdom food supplies, but its attention was split between food and the physiological aspects of chemical warfare, with the concentration on the latter.

The gas work of the PWC was soon integrated into the existing machinery of government, partly perhaps because of its perceived special urgency, partly because the institutional framework for integration already existed in the Medical Research Committee (MRC), established in 1913. There was also the involvement of Alfred Keogh, the Director of the Army Medical Service, who was a member of the British Science Guild. He had originally urged the establishment of the PWC to work on gas warfare problems out of the original Chemistry sub-committee of 1914. Keogh acted as a channel of influence with government, and in January 1918 he appointed almost all of the PWC to a new Chemical Warfare Medical Committee set up under the MRC. This was to coordinate research into gas poisoning and its treatment. The new Committee's first publication was a reprint of the PWC's pamphlet of September 1917, Notes on the Effect of Pulmonary Irritant Gases, and

¹¹ See M. Teich, op.cit., pp.6-7.

Keogh himself issued a memorandum to Medical Officers in April 1918 largely based on this.¹²

A further factor holding up integration in food research was the attitude of the government, and particularly in this area, of the Board of Trade. The supply of food was, in the early years of the war, considered as part of the general workings of the economy, rather than as a special scientific area in which the State should become involved, with expert guidance. Government policy was to leave the market, as far as possible, to regulate itself. This so-called 'business as usual', non-interventionist approach was believed, particularly by Runciman at the Board of Trade¹³, to be the most effective way of ensuring the civilian food supply, as well as maintaining the availability of revenue and credit facilities for the government to pay for the war. In any case, the war was not expected to last very long. As E.M.H. Lloyd, who as Assistant Secretary at the Ministry of Food played a large part in devising the machinery of control over meat, milk and fats during 1917-18, commented in 1924:

In the absence of any plan of industrial mobilization for war, this was the only possible policy to pursue. A prosperous state of trade, regular employment at good wages and high profits for the Revenue to tax and the Treasury to borrow, were regarded with good reason as essential conditions for the successful prosecution of the war.¹⁴

Perhaps partly in response to the prevailing lack of government interest in the scientific aspects of the problem of food, and the accompanying absence of any institutional mechanisms for formulating a scientific food policy, by December 1916 members of the PWC had persuaded the Society's Council that food warranted separate investigation, and the new Food (War) Committee was appointed on 16 December 1916.¹⁵

¹² See Steve Sturdy, '...Oxygen Therapy', *op.cit.*, p.107, and p. 114.

¹³ On Runciman's hands-off position and subsequent conversion to intervention, see Beveridge, *op.cit.*, chapters 2-3, *passim*. The establishment of the executive Royal Commission on Sugar Supplies on 20 August 1914, to handle purchase, sale, distribution, and control of sugar in Britain, was an exception to this general policy, though, as Beveridge points out, its activities were actively distanced from Runciman's non-interventionist Board of Trade, the more natural institutional home for such a body. However, Beveridge states that a 'Cabinet committee' on Food Supplies, set up at the outbreak of war, did not issue any reports, and soon merged back into the Cabinet. He may have meant a Ministerial committee since Cabinet committees can be made up of officials.

¹⁴ E.M.H. Lloyd, Experiments in State Control at the War Office and the Ministry of Food, (Oxford, Clarendon/Carnegie Endowment, 1924), p. 261. See also David French, British Economic and Strategic Planning, 1905-15, (London, George Allen and Unwin, 1982).

¹⁵ See Food (War) Committee, Minutes, Vol.I, 1916-17, Royal Society Archives (RSA), Ms. 503/Cmb.72, p.1; Royal Society (War) Committee, Sectional Committee on Physiology, First Interim Report, Jan. 23 1918, p.1, RSA, Ms. 505; Teich, *op.cit.*, p. 7.

The first Food sub-Committee of the PWC was formed independently of any request from government in July 1915 to draw up a report on the food supply of the German Empire. It consisted of: Professor A.D. Waller, director of the Physiological Laboratory at the University of London and chairman of the committee, F. G. Hopkins, Professor of Biochemistry at Cambridge and T.B. Wood, Professor of Agriculture at Cambridge.¹⁶ Ashley was invited to join the sub-committee at the end of July 1915. Waller approached Ashley after having seen a copy of his paper to the Royal Society of Arts of 24 February 1915 on the economic position of Germany.¹⁷ The debate about the German food supply had recently been stimulated by the publication in Germany in December 1914 of a report edited by Professor Paul Eltzbacher (acting Rektor of the Commercial Hochschule in Berlin) and a committee of scientists (including physiologists, political economists and statisticians) which had concluded that Germany could be self-sufficient in food in spite of the blockade.¹⁸ The report received wide coverage in Britain: it was summarised in The Lancet on 20 February 1915, and was translated into English in its entirety later in 1915 under the title, Germany's Food: Can it Last.¹⁹ In the light of this, Waller, for one, became increasingly concerned to stiffen the Government's blockade policy, particularly since he had observed from the Board of Trade Returns that wheat, malt and cocoa were being readily exported to neutral countries, and thence to the enemy.²⁰ He had been especially worried by reports received by the Royal Society that plans were afoot to contraband cotton but liberate food from blockade.²¹ He wanted the Royal Society to submit a report stressing the necessity of a tight food blockade. Ashley contributed a memorandum on German food supply in which he concluded that Germany's ability to feed her population was not due to government measures but to her continuing supply of foodstuffs via neutral countries, some of which may have originated in Britain.²² This formed the second part and appendix to the First Report of the

¹⁶ See Waller to Ashley, 25 July, 1915, W. J. Ashley Official Papers (AOP), British Library, Add. Mss. 42244A, ff. 6-7.

¹⁷ See Anne Ashley, op.cit., p.151 and Ashley 'Note on my First Period of Active Service on the Royal Society Food (War) Committee, July 1915-July 1916', AOP, Add.Mss. 42244A, ff.1-2. The invite came informally from Waller in a letter of 25 July 1915, AOP, op.cit. ff.8-9, and formally from the Secretary of the Royal Society on 26 July, Ibid., f.10.

¹⁸ See Physiology (War) Committee, First Report on the Food Supply of the German Empire, 14 August 1915, p.1; E. H. Starling, op.cit., pp. 5-6; Teich, op.cit., pp. 7-12; and Avner Offer, The First World War: An Agrarian Interpretation, (Oxford, Clarendon Press, 1989), *passim*. With economies and substitutions, the report estimated that about 90% of pre-war calorific value of food and 87% of the protein value was still available to the Germans. See Offer, p. 25.

¹⁹ See Teich, Ibid., p. 12.

²⁰ See Waller to Ashley, 23 July 1915, AOP, op.cit.

²¹ Waller to Ashley, 6 August 1915, AOP, op.cit.

Physiology (War) Committee on the food supply of the German Empire, printed by the Royal Society for official circulation only, on 14 August, the first part being written by Waller. The report cast doubt on the optimistic predictions of the Eltzbacher report, arguing that Germany could only feed herself by supplementing her domestic production with considerable imports. This was a strong argument for tightening the blockade.²³

Fears that the blockade was being subverted were common in government circles concerned with implementing blockade policy; Britain had already begun negotiations with neutral continental powers to extend the terms of the blockade beyond what was sanctioned by pre-war international agreements. From March 1915 Britain moved towards an unrestricted blockade by negotiating agreements with the northern neutrals, from whence overseas products had been reaching the Germans, often via Britain. However, many foodstuffs were still not subject to blockade.²⁴ Nevertheless, the committee still had to pitch its line very carefully. It wanted to influence policy in favour of a stringent blockade and in order to do this had to take a tactful line with the Board of Trade, which was opposed to any tightening of the blockade. The Board was, as was noted, in favour of a non-interventionist stance and also represented business interests which aimed at cornering former German markets.²⁵ Given the lack of any existing machinery for advice in the area of food, the committee had to create its own channels, and keep them open. Waller summed up the committee's strategy of influence in a letter to Ashley in August:

I think the line that we should take now would be to "gently" comment upon the contribution to German food supply from British sources.

I realise...that there is strong pressure in favour of keeping up exports, even of food and potential ammunition and that the Board of Trade has been badly [unidentifiable word] by the Merchant. I want the Royal Society to take the other side of the picture into view and to represent it to the Board of Trade without adopting a critical attitude. And I want us to keep out of the newspapers.²⁶

²² Ashley, 'Physiology (War) Committee of the Royal Society. Food Supply of the German Empire. August 11 1915. Memorandum by Prof. Ashley', AOP.

²³ First Report of the Physiology (War) Committee of the Royal Society. The Food Supply of the German Empire, 14 August 1915, AOP. See also E.H. Starling's The Oliver Sharpey Lectures on the Feeding of Nations A Study in Applied Physiology, (London, Longmans Green, 1919), p. 7.

²⁴ See Gerd Hardach, The First World War, (Harmondsworth, Penguin, 1987, originally 1977), Chapter 2, especially, pp. 11-27.

²⁵ Ibid., p. 19.

²⁶ Waller to Ashley, 30 August 1915, op.cit.

Already the scientists of the Royal Society were thinking in terms of how best to gain influence over food policy.

At this point the Royal Society had established contact only with the Board of Trade on food questions. It was their first connection to food policy (the report on German food supplies was undertaken independently by the Society). Waller was thus understandably keen to take a cautious line to preserve the as yet tenuous influence of the Society. As he wrote to Ashley:

As to the Board of Trade I should be very sorry to take up a critical attitude as I don't think we can get on without them. It is so far the only department to which anything has gone from the Royal Society on the food matter.²⁷

Waller was convinced that a constructive blockade policy would not be pursued without the influence of the Physiology (War) Committee's experts: he ended one letter to Ashley by observing that, 'the ignorance of our politicians [on 'Commerce questions'] appears to me to be unfathomable. Can you understand it?'²⁸

In early February 1916, the second report again strongly supported food blockade, arguing that existing measures had had an effect and that further provisions could result in a fatal weakening of Germany. Particular emphasis was laid on the importance of the shortage of fats and oils in Germany, and the necessity for blocking imports of these as stringently as possible.²⁹ Ashley contributed the majority of the first nine sections, with Waller providing the tenth and final one. This time reports were submitted not only to the Board of Trade, but also to the Admiralty, the Board of Agriculture, and the Foreign Office.³⁰ As well as the support for blockade, the report also argued that the German experience indicated the need for a national food policy for Britain. In addition to being essential for the compilation of the reports on the German food supply, the widely disseminated Eltzbacher report, with its analysis in terms of required calorific and protein values of food also served as a starting point for a scientific survey of the British food situation.

²⁷ Waller to Ashley, 10 August 1915, AOP, *op.cit.*

²⁸ Waller to Ashley 30 August 1915, *op.cit.*

²⁹ Second Report of the Physiology (War) Committee of the Royal Society. The Food Supply of the German Empire, 10 February 1916, AOP, *op.cit.*; See also Starling, *op.cit.*, pp. 7-8.

³⁰ See Royal Society (War) Committee, Sectional Committee on Physiology, First Interim Report, Jan. 23 1918, p.1, RSA, Ms. 505.

During February and early March 1916, the committee developed closer relations with the Government. Waller wrote to Ashley that the government had requested a meeting with the PWC on 9 March and that it 'appears to want to learn a little elementary physiology and economics'.³¹ Ashley described how later: 'In March the Board of Trade (whether of its own motives or prompted I know not) asked the Royal Society to prepare a report on the Food Supply of the United Kingdom'. At a small meeting of the existing food sub-committee of the Physiology (War) Committee at Cambridge, Ashley argued that they must have access to all the information held by the Boards of Trade and Agriculture, and that other scientific experts should be co-opted onto the committee. Accordingly, a new sub-committee of the Physiology (War) Committee was established, in late March or early April, and A.W. Flux from the Board of Trade and T.H. Middleton from Agriculture, and Professors Thompson of Dublin and Noel Paton from Glasgow, were invited to join.³² A.D. Hall of the Development Commission³³ also joined sometime before the submission of the final report.³⁴ However, it is indicative of the uncertain status that the Royal Society food committees occupied in their advisory capacity to government that although these developments were occurring from March, the official invitation to submit a report does not seem to have come from Runciman to Hardy possibly until early June 1916.³⁵ Hardy's letter and memorandum to a Board of Trade official of 29 March indicates that the request for a report 'on the food supplies needed by the home population in certain eventualities' may have originated from a Cabinet committee. The existing food sub-committee of the Physiology (War) Committee decided (probably at the Cambridge meeting described above by Ashley), that a special investigation was needed.³⁶ Hardy followed this up with an informal visit to Runciman. He wrote to Ashley on the 31 March that he had that morning:

³¹ Waller to Ashley 6 March 1916, AOP, *op.cit.*

³² Ashley 'Note on my First Period of Active Service...', AOP, *op.cit.* See also Food (War) Committee, Minutes, Vol. I, 1916-17, Royal Society Archives (RSA), 503/Cmb.72, p.1.

³³ Alfred Daniel Hall: (1864-1942), educationalist, administrator, and scientific research worker. He was asked to join the Development Commission by Lloyd George in 1910 (where he organised agricultural education), and subsequently became Director of the Rothamstead Experimental station. He became Permanent Secretary at the Board of Agriculture in 1917 at the invitation of the President, R. E. Prothero (later Lord Ernle). He was a member of Milner's Food Production Committee, and continued at the (now) Ministry of Agriculture from 1920-7 in the post of Chief Scientific Adviser. He later became a member of the Economic Advisory Council (DNB). He was an active member of the FWC from when he joined in early 1916 throughout 1917, though his bureaucratic commitments at the Board eventually meant he had to retire from the FWC, and send one E. S. Beaven to act as his proxy. (See FWC Minutes)

³⁴ See signatories of The Food Supply of the United Kingdom: A Report drawn up by a Committee of the Royal Society at the Request of the President of the Board of Trade, 9 December 1916, cd.8421/1917.

³⁵ Hardy to Waller, (copy), AOP, *Ibid.*

³⁶ Hardy to E.R. Eddison, 29 March 1916, RSA Ms. 505.

...had a conversation with the president of the Board of Trade about the need for a report upon the available food supplies, and I have arranged with Mr. Flux of that Department to meet the sub-committee sometime next week. Mr. Middleton of the Board of Agriculture also hopes to be present.³⁷

Certainly, as Ashley noted, the sub-committee must have begun work after these informal contacts, rather than waiting for an official request, because the first part of the report was ready for the consideration of the Royal Society by 17 June 1916.³⁸ The second and third parts of the report were published separately by the Society (and widely disseminated), on 29 July 1916. The final full report (uniting all three parts) was collated by 9 December 1916. It was sent to the Board of Trade which then distributed it to other interested departments,³⁹ and was published as a White Paper.⁴⁰ The first part of the report presented data on the United Kingdom's food supply from 1909-13. It argued that the problem of food was both statistical and physiological: it was necessary both to know statistically what foods were available, and in what quantities, and whether these foods were physiologically adequate (in terms of their nutritive value) to support men, women and children, at a calculated minimum calorie intake.⁴¹ The second part of the report summarised the position in 1916, concluding that, given equitable distribution, there was already enough food. The third part gave suggestions for economising on the use of the available food supply.⁴²

Ashley believed that the three reports were influential in shaping policy. He later commented that:

The Reports on Germany were circulated to certain Government offices and had some influence, I believe, on the Blockade policy. The Report on the U.K. served as the statistical basis of the subsequent food policy.⁴³

³⁷ Hardy to Ashley, 31 March 1916, *Ibid.*

³⁸ Report of the Physiology (War) Committee of the Royal Society on the Food Supply of the U.K., dated June 17 1916. Printed by the Royal Society, AOP, *op.cit.*, ff.150-161.

³⁹ See Eddison to Hardy, 10 November 1916, RSA, Ms. 505.

⁴⁰ The Food Supply of the United Kingdom...

⁴¹ See Starling, *op.cit.*, pp. 8-9.

⁴² *Ibid.*, pp. 9-12.

⁴³ Ashley, 'Note on my First Period of Active Service...', *op.cit.*

Beveridge later implied that the Board of Trade's commissioning of the report on the United Kingdom was part of the movement to control in food: though the Board was still not convinced of the necessity of intervention in early 1916 it commissioned, 'a thorough and scientific survey of the situation'.⁴⁴ The Board's action also demonstrated that the PWC's efforts to establish a channel of communication with the government by sending unsolicited reports had paid off, and that the government had at least accepted the validity of a scientific analysis of the food problem. The report on the food supply of the United Kingdom was the first attempt to assess national needs in terms of individual calorific requirements, rather than of overall volume. Whatever its direct influence on government thinking, and this will be examined later, it was an attempt to scientise the food problem. If government could be convinced of this kind of approach, it would necessitate the involvement of physiologists (and economists/statisticians) in the policy process .

2. THE MINISTRY OF FOOD AND DEVONPORT AS FOOD CONTROLLER

A number of developments occurred between June and November 1916 which pressured the Government into assuming some control of the food situation. By June 1916 retail food prices were 59% up on the level of July 1914, and this caused much public consternation.⁴⁵ A stop-gap measure to deflect public criticism of inaction was to appoint in June a Board of Trade Departmental Committee on Food Prices to examine the causes of inflation and suggest possible remedies.⁴⁶ Ashley served on this and temporarily resigned from the PWC due to pressure of work and fear of compromising his confidentiality by discussing issues at both forums.⁴⁷ However, pressure for government action continued to mount. In August the much publicised second PWC report stressed that even a small reduction in the food supply could be borne 'only on the condition that steps were taken to ensure the equitable distribution of the available food throughout the population'. Expanding on this the report argued that:

While the supply of food has, up to the present, been adequate for the support of the population, the rise in prices has accentuated the inequalities of distribution, which reduce the daily ration of many below the level of efficiency. Any curtailment of supplies, even to a

⁴⁴ Beveridge, *op.cit.*, p. 16.

⁴⁵ Beveridge, *op.cit.*, p. 19.

⁴⁶ *Ibid.*, pp. 19-20.

⁴⁷ See Ashley to Hardy, 9 August 1916, RSA Ms. 505. However, Ashley continued to correspond with Hardy on food matters, and to receive agendas and minutes of the PWC and later of the Food War Committee.

limited extent, would result in the poorer classes obtaining less than is needful for safety should distribution remain unorganised.⁴⁸

On 22 September came a minority report of the Food Prices Committee which called for the State to become the sole purchaser of imported meat and bacon, and to fix prices for home produced meat, milk and bacon. On 10 October bread was taken under State control with the setting up of the Royal Commission on Wheat Supplies. Like the Sugar Commission this was an executive body and it became responsible for all the imports of wheat into the country.⁴⁹ But Parliamentary pressure for food to be centrally organised on a war-footing also began to mount. This culminated in the debate in the House of Commons on 15 and 16 November on a motion proposed by the historical economist turned M.P., W.A.S. Hewins, that the Government should organise the national food supply. Beveridge saw this as the moment when Runciman, in replying, formally abandoned the 'business as usual' voluntary method in food. The Defence of the Realm Acts were extended to give the Board of Trade power over prices, distribution and manufacture and other areas of food supply, and the Government's intention to appoint a Food Controller to co-ordinate the efforts of the various departments concerned was announced.⁵⁰ The Controller was eventually appointed as the head of a new Ministry of Food. Lord Devonport⁵¹ was appointed Controller on 10 December and the new Ministry formally came into being on 22 December.⁵²

The Royal Society at first saw the establishment of the Ministry of Food and the appointment of Devonport as an opportunity for closer involvement of outside scientists in the making of food policy, as well as the possibility of centrally co-ordinated and funded human nutrition research. Thus, from the outset, they pressed for a formalisation of their links with the new Ministry in terms of organisation, funding and influence. In November 1916, the PWC drew up a 'Proposal to Constitute a Board of Research to deal with Food Problems' to initiate and superintend experiments in food economy. The new body would

⁴⁸ Cd 8421, *op.cit.* Cited here from Starling, *op.cit.*, p. 10 (both quotations)

⁴⁹ Beveridge, *op.cit.*, p. 22.

⁵⁰ *Ibid.*, pp. 24-5.

⁵¹ Devonport was the owner of a retail grocery chain and partner in a big London tea importers, Kearley and Tonge. His Parliamentary Secretary was Captain Charles Bathurst, a former gold medallist at the Royal Cirencester Agricultural College, and member of the British Science Guild. He represented agricultural interests in the Ministry, and was keen on applying scientific methods and discoveries. The Permanent Secretary was Sir Henry Rew, an experienced civil servant with close farming connections, and a statistician. Beveridge was head of the Labour Department of the Board of Trade contingent at the new Ministry.

⁵² See N.B. Dearle, *An Economic Chronicle of the Great War for Great Britain and Ireland*, (London, OUP, 1929).

report to the PWC and would need to be in close touch with other relevant areas of government. The hope was expressed that just as earlier Royal Society committees had been the precursors to more formalised relations between experts and government, so the same thing could happen in the area of food:

In the early days of the war the Engineering, Physics and Chemistry War Committees of the Royal Society investigated many urgent problems submitted by the Admiralty and the War Office. These committees paved the way for the Board of Invention and Research. In the same way it might be advisable, informally, to test the need for and utility of a Food Board of Research, by using temporarily a committee of the Royal Society for the purpose. The present Food Committee would form the nucleus of such a body.⁵³

No doubt to coincide with the establishment of the new Ministry and to impart an added authority to the Royal Society's work on food, in December 1916 the Food Sub-Committee was itself reconstituted as a full sectional committee: the Food (War) Committee (FWC).⁵⁴ At the first meeting a memorandum to the new Food Controller was unanimously agreed. This stressed that the Ministry of Food should appoint a man of science to its higher staff, 'a man thoroughly cognisant of the physiological and agricultural aspects of food supplies, who must be placed in such a position that all proposals of the Department come before him at an early stage.' The idea was to get a formal means of communication with the executive through which confidential information about 'commerce, importation, stocks and organisation' could flow from the ministry to the FWC, and through which informed advice could flow back, and be heeded. To avoid unnecessary friction, the FWC were careful to state explicitly here that they were not seeking, technically, to usurp the policy-making powers of the executive by this appointment. But they were attempting to establish a formal procedure whereby scientific influence could shape policy ideas before they became set in stone:

The Committee are not proposing that he should be given executive powers, but that he should be in a position to advise and criticise any suggested measures of food economy at their inception before any attempt has been made to reduce them to regulations. His expert knowledge would be far more effective at this stage than if its

⁵³ See Physiology (War) Committee Food Sub-Committee, 'A Proposal to Constitute a Board of Research to deal with Food Problems', 30 November 1916, RSA, Bound copy of Physiology (War) Committee sub-committee Food and Food (War) Committee Reports, supplement to Boxes 527-30. See also L. Margaret Barnett, *op.cit.*, especially pp. 96-7.

⁵⁴ See Royal Society War Executive Committee Minute Book, meeting of the Executive, 15 December 1916, RSA, Ms. 463 (Cmb 37).

operation were deferred and confined to suggestions for the revision of a programme already drafted. Still less effective would be the possible criticisms or revision by the Committee of proposals put into shape by the Department.

However it is clear that their goal was to frame policy (in all but name) along scientific lines. This is apparent from their use here of the argument familiar from Edwardian public science that only a scientific man could tell when scientific input was needed. Furthermore, the memorandum ended by rehearsing that other familiar argument of public science, that since food policy was a scientific problem, scientists should have proper influence over it:

The Committee believe that only in this way, by the presence of a scientific man inside the Department, can the assistance of scientific men be properly made to bear on these problems of food control, production and utilization, all of which are problems essentially scientific in character.⁵⁵

There could be no clearer statement of the aims of the leading members of the FWC, and particularly of Hardy, than his comments in a letter to Waller at the beginning of March 1917. Waller had written suggesting the Committee involve themselves with the question of the diet of German P.O.W.s. Hardy replied that this was 'rather of the nature of a political cry' and anyway was 'a minor matter'. He was keen to avoid any whiff of political controversy, especially over such a trivial problem, which might in any way detract from the Committee's wider objective. As he wrote: 'We are out for bigger things, namely the control of the general policy to be pursued with respect to the economy and right use of food'.⁵⁶

The Ministry took the suggestion of the appointment of a Scientific Adviser on board and asked for a name.⁵⁷ The FWC suggested T.B. Wood and he was appointed on 16 January 1917.⁵⁸ Flushed with this success, Hardy, now wrote to relevant government

⁵⁵ See A. Kempe (first Chairman of FWC) to Lord Devonport, 18 December 1916, RSA, Ms. 530 and FWC Minutes, 18 December 1916, RS A (CMB 72).

⁵⁶ Hardy to Waller, 5 March 1917, RSA Ms. 530. See also Hardy to D. Noel Paton, 10 March 1917, *Ibid.* The Committee had decided not to send the Food Controller a report on the diet of schoolchildren. Hardy explained why: 'The Committee is trying to influence larger questions of policy; we have already sent in memos. dealing with those [matters] and another still larger one is going through the [Royal Society] press. So far as we can gauge Lord Devonport's temperament it is unsafe to importunate and the school question being merely part of the whole, we [the treasurer of the Society, and Chairman of the FWC, Kempe and Hardy] felt that it had better be held up for the present.'

⁵⁷ See Beveridge to Kempe, 27 December 1916, *Ibid.*

⁵⁸ See Beveridge Papers, (LSE), Misc. Vol 92, Beveridge Special Collection on Food Control, (BPF), Vol. XII, 'Organisation, Powers and Personnel of the Ministry' specifically the item 'Schedule of Officers Employed in the Ministry of Food. Corrected up to 7 June 1917'; see also Hardy to Rew 3 January 1917, *Ibid.*

Departments flaunting what he perceived as its new and formalised semi-official position, and using this to press for access to otherwise confidential information.⁵⁹

The pattern of the Committee's work established itself, though only temporarily, through January to early March 1917. Reports on such subjects as saccharin, sugar, retail prices, stowage space, glucose, the soya bean and the rationing of breadstuffs were prepared and submitted to the Ministry of Food.⁶⁰ The Committee also initiated its series of reports significantly entitled 'National Food Policy'. This was a wide-ranging series of direct policy recommendations which ran from December 18 1916 to March 11 1918, and amounted to eleven separate reports.⁶¹ The keynote of these reports was the insistence on maintaining an unrestricted supply of bread.⁶² The Committee had set itself firmly against bread rationing arguing that it was the staple food of the working classes and that its restriction would cause serious morale and even public order problems. As the 'National Food Policy' report on 'The Primary Importance of Breadstuffs' stressed in March 1917, bread must not be rationed:

The Committee wish, therefore, to insist with all the weight that their knowledge may carry, that the first necessity of the case is to maintain the supply of bread at its highest possible point, and that its consumption should be unrestricted....While among the middle classes bread supplies less than one third of the energy of the total food they consume, with the poorer families of the working classes bread alone has to furnish more than half of the energy of their dietary....the fundamental basis of the national food policy, particularly having regard to the needs of the workers, should be the maintenance of unrestricted bread supply at the expense of meat and other foods.⁶³

Ashley was persuaded to re-join in February, partly because someone to draft memoranda was needed.⁶⁴ Ashley returned to the committee for the 9 February 1917 meeting. He was formally re-appointed at the meeting of 2-3 March, when he, Flux and

⁵⁹ See Hardy to Sir Kenneth Anderson (Ministry of Shipping), 10 January 1917, *Ibid.* The letter begins, 'The Food (War) Committee is now established in an advisory capacity to the Food Ministry and T.B. Wood of Cambridge is our representative actually in the Ministry.' It then goes on to request information on the allocation of cargo space for different foods in ships. See also Hardy to Commander Leverton Harris, 29 December 1916 about blockade policy which is similarly couched.

⁶⁰ See RSA bound copy of PWC and FWC reports, *op.cit.* frontispiece, 'List of Reports by the Food (War) Committee of the Royal Society.'

⁶¹ *Ibid.*

⁶² See Stark, *op.cit.*, pp. 133-4.

⁶³ FWC Report 28b The National Food Policy. Memorandum to Lord Devonport: The Primary Importance of Bread, 2 February 1917, AOP, 42244B. See also Report 16 The Rationing of Breadstuffs (3 March 1917), RSA FWC Bound Reports *op.cit.* and Report 28d The National Food Policy. The Primary Importance of Bread, AOP, *Ibid.*

⁶⁴ Ashley 'Note on Second Period of Active Service on the Royal Society Committee, AOP, 42244B, ff1-3, written September 1920.

A.W.J. McFadden were appointed as a sub-committee to draw up a memorandum on rationing with special reference to the FWC's opposition to the rationing of bread. This theme was to dominate Ashley's second period of service.⁶⁵ Ashley picturesquely described the drafting of his sub-committee's report on rationing:

We had an afternoon meeting in Flux's rooms at the Board of Trade...and then adjourned for dinner...and then resumed at nine. As we came out with the Report finished, the clocks of Whitehall were sounding Midnight. The Report was typed and I think considered by the Committee next day and printed at once for the Government.⁶⁶

The Report was in fact read by Flux at the FWC meeting of 9 March, Hardy commenting that it was 'remarkably able...was discussed with great care...and little more than verbal alterations were made'.⁶⁷ The Report was then adopted at the 16 March meeting, and was circulated to the Government as report 28d of the special series on National Food Policy, 'The Primary Importance of Bread'.⁶⁸ The Report stressed the Royal Society's position that the supply of bread should be maintained at current levels, if necessary sacrificing other imports to secure this, and that no restrictions should be made on its consumption. The report argued that it was impossible to ration bread 'without the gravest danger to the health and efficiency of the poorer element of the population'.⁶⁹

Ashley's next contribution appears to have been a memorandum on the organisation of rationing written on 28 March, and discussed, along with Paton's memorandum on bread and meat rations, at the 13 April meeting.⁷⁰ However, it was Paton's memorandum which formed the subsequent Report 28f, 'A Limited Measure of Food Distribution'.⁷¹

The good relations between the FWC and the Ministry, which had seemed in prospect during the early months of Devonport's period in office, soon evaporated however. The months from March through to the end of May 1917 saw the FWC increasingly despairing of

⁶⁵ See Food (War) Committee, Minutes, Vol.I, 1916-17, Royal Society Archives (RSA), 503/Cmb.72,p.20-2 (9 Feb. meeting) and pp.26-34 (2-3 March meeting).

⁶⁶ Ashley, 'Note on Second Period of Active Service...', *op.cit.*

⁶⁷ See Food (War) Committee Minutes *op.cit.*, pp.35-6 (9 March meeting); Hardy to Paton, 10 March 1917, RSA, Box 530.

⁶⁸ See Food (War) Committee Minutes, *op.cit.*, pp.37-44 (16 March meeting); For this Report, and list of all reports see Bound copy *op.cit.*

⁶⁹ Food (War) Committee, Report 28d, 'The Primary Importance of Bread', 16 March 1917, quoted here from AOP, Add.Mss. 42,244B, ff.58-60.

⁷⁰ Ashley, 'Notes on the memorandum of the Physiology Committee sub-committee presented 23 March 1917, AOP, 42,244B, ff.66-8; F. Saxton to Ashley, 10 April 1917, AOP, *ibid.*, f.75.

⁷¹ Dated 13 April 1917. See Food (War) Committee Minutes, *op.cit.*, pp.54-8, (13 April meeting).

Devonport's receptivity to scientific advice, or at least his willingness to give the scientists the kind of power they wanted. Sensing that perhaps the FWC had not gained the kind of official position in the food policy process it desired in its link with the Ministry, the committee began to embark on an exploration of new channels to policy influence. The committee found the Ministry implementing policies with which it could not agree. Perhaps the most objectionable of these to the FWC was the encouragement of Voluntary Rationing, and the additional reduction of one pound a week less bread, which the Committee argued would simply hit the poorest who could not afford substitutes to bread. At the same time it was clear that the Ministry had not given up entertaining bread rationing. Members of the FWC began to grow impatient. In early March, Noel Paton, who had already suggested that the only solution to the problem of the Ministry's deafness to scientific advice was for it to be forced to constitute inside itself a small scientific committee,⁷² wrote to Hardy. It was obvious that the Ministry was not listening and that, 'The position of our Committee and of Wood and Thompson is simply absurd, and, unless our relations with the Food Department can be improved, I think we might as well come to an end'.⁷³ However, Hardy was not be so easily beaten. Having been frustrated in attempts to gain major influence over food policy via the Food Ministry, he was sounding out a new, more direct route of attack on the very citadel of policy-making: the War Cabinet itself. Copies of FWC Report 28d, The National Food Policy, The Primary Importance of Bread, had already been sent on 16 March directly to the War Cabinet, via the Assistant Secretary, Thomas Jones.⁷⁴ Hardy was confident that this channel would prove fruitful, and that the FWC would thus be able to block the rationing of bread. On 17 March Professor W.G.S. Adams, head of Lloyd George's Secretariat, also wrote to the Royal Society requesting further copies of the latest report. The same day Hardy wrote encouragingly to another Committee member, Ashley, telling him of the promising results of the new method of approach:

I don't think we shall fail of our object. A...message has just come from 10 Downing Street to say that the Memorandum is of great importance and asking for more copies so that each member of the War Cabinet may have copies on Monday. The memorandum is to be given first place, I gather, on the War Cabinet's agenda.⁷⁵

⁷² See Paton to Hardy, 8 March 1917, RSA, Ms. 530.

⁷³ Paton to Hardy, 13 March 1917, *Ibid.*

⁷⁴ See Jones to Freda Saxton (clerical secretary of the Royal Society), 17 March 1917, in which he requests further copies of FWC Report 28d, The National Food Policy, The Primary Importance of Bread, RSA, Ms.530.

⁷⁵ Hardy to Ashley, 17 March 1917, AOP, 42244B, *op.cit.*

Ashley, however, was still not happy. He re-emphasised to Hardy the point made being made in the draft of the most recent report,⁷⁶ that such *ad hoc* influence was hardly satisfactory. He stressed that there needed to be some central authority covering all aspects of food policy, rather than the patchwork of Departments, Committees and Commissions:

I gravely doubt whether there exists any co-ordinating committee or authority, with a conspectus of the whole situation before it...If the Royal Society Committee were an ordinary Government Food Committee, it ought to represent to the Government the necessity of some such co-ordinating centre, which shall know all there is to know. Otherwise we are steering for chaos.⁷⁷

Hardy replied confidently asserting that the FWC was, *de facto*, this co-ordinating centre:

It is exactly the absence of a co-ordinating body that is the *raison d'être* of the Royal Society Committee. I have long wanted to suggest an increased need for co-ordination; the lack of it in the Ministry of Food is astonishing. At present co-ordination is effected by mutual representation. For instance, Rew sits on the Wheat Commission; but the choice of persons being merely a matter of official rank is lamentable, Rew's 'policy' being merely *laissez faire* optimism. The Royal Society Committee, having the ear of every important body including the Cabinet (but excepting the Ministry of Food), and, from its composition, bringing to the same council board many types of minds, is, in effect, the general advisory committee and, so far as there is a common national policy, those who know admit it to be the work of the Committee. Even where individuals have exercised special influence they have been members of the Committee, educated by its discussions.⁷⁸

Clearly Hardy thought his new channel of direct influence was working well, even if a somewhat piqued tone at not being officially recognised (especially by the Food Ministry) can still be discerned. Optimism continued to run high, for a time. On the 17 and 24 March, Adams drew up statements for the War Cabinet based on the Royal Society's argument that the bread supply must meet the demand.⁷⁹ Hardy was careful to cultivate this new connection carefully. He wrote directly to Adams on 2 April saying:

I should be glad of an opportunity for a talk with you concerning Food Policy. The group of economists, physiologists, agriculturalists and Civil Servants, which has been working at the subject now for two

⁷⁶ Report 28f in the National food Policy series, A Limited Measure of Food Distribution.

⁷⁷ Ashley to Hardy, 28 March 1917, RSA, Ms. 530, original emphasis.

⁷⁸ Hardy to Ashley, 29 March 1917, Ibid.

⁷⁹ W.G.S. Adams, Papers sent to prime Minister for Cabinet discussion of food situation, March 1917, 17 March 1917, F/232. Lloyd George Papers; Adams to Prime Minister, 24 March 1917, F/15/2/5, Lloyd George papers; War Cabinet Minutes, 15 March 1917, Appendix 2: W.G.S. Adams, The food question, CAB 23/2/38. Cited by Barnett, op.cit., p. 109

years, is seriously concerned at the outlook....Physiological and economic considerations seem to be entirely absent from the Food Ministry. It may sound an exaggeration; but I can assure you that neither the fact itself that food is fuel, and that the quality of fuel supplied fixes the output of work, has been grasped, much less its implications. What slender lodgement such considerations as these have in the Department is vanishing, for Professor Wood is going to the Board of Agriculture, and Professor Thompson is sending in his resignation.⁸⁰

This letter resulted in a meeting between the two scientists on 4 April. This apparently went well. Hardy wrote triumphantly to Ashley:

The fate of the last memo. will be of interest to you. It is minuted for consideration by the War Cabinet, and it is being abstracted and commented on for the special benefit of the Prime Minister.

The situation now is quite clear to me and the Committee is the recognised advisory body, recognised that is by all except the Food Controller. The responsibility is really very great. We can have any information we like, there is no doubt of that, but we shall have to indicate what information it is we want, just as any ordinary Government Committee would have to do....The Committee must get ahead faster and I am considering a week of meetings.⁸¹

However, though pleased with the results of the new approach so far, Hardy was aware that he was now relying uncomfortably heavily on Adams as a channel of influence. Hardy wrote to A. D. Hall the following day:

The upshot of an hour's conversation with Adams is that our last Memorandum is minuted for the Cabinet next week; it is to be blue-pencilled for the Prime Minister's special consideration; and that the relations of Food Committee to the Cabinet are to be considered. Pressure also is to be brought to bear on the Ministry of Food to accept guidance....Of course, all hinges on the good faith of Adams, is he genuine in his protestation of belief in the need for policy, and of acceptance of our policy? Or is he administering soothing syrup?⁸²

Acutely aware of this possible problem. Hardy had also suggested to the Labour Party that they form a committee to meet with the FWC and be briefed on scientific food policy.⁸³ He also felt that the FWC needed a spokesman in the Cabinet, and agreed with Hall's idea of approaching Milner.⁸⁴ This later move however eventually came to nothing, but is an

⁸⁰ Hardy to Adams, 2 April 1917, RSA, Ms. 530.

⁸¹ Hardy to Ashley, 5 April 1917, RSA, Ms. 530.

⁸² *Ibid.* See also Hardy to Sir A. Kempe, Chairman of the FWC, 4 April 1917, RSA, Ms. 530.

⁸³ See Hardy to Hall, 5 April 1917, *Ibid.* On the Labour Committee see also F. Saxton to Ashley, 4 April 1917, AOP, 42244B.

⁸⁴ Hardy to Hall, 5 April 1917, *op.cit.*

excellent indicator of Hardy's grand plans for the FWC, and his new fascination with such networking as a *modus operandi*.⁸⁵ Shortly afterwards the Cabinet decided to prioritise the import of foodstuffs, including wheat, and Hardy claimed a major victory for the scientists and a confirmation that the new method of approach had secured them a privileged position in policy-making. He wrote again to Ashley on 11 April:

I am sending...two letters from Adams...they are interesting as marking the steady way in which the Committee is gaining influence. Rew's letter is an immense advance. It is not so long since he told Wood that he could not see how scientific considerations came into the food question at all! Adams told me that Devonport himself was becoming much more amenable to reason; indeed, the public utterances of the Department, and especially of Bathurst, show more and more a movement in the right direction as fast as is consistent with saving their faces.⁸⁶

Hardy's new method of approach seemed to be achieving results. The FWC had direct access to the Cabinet via the sympathetic Adams, and was coming to be considered the Cabinet's official food advisory committee. Even the hitherto recalcitrant Ministry of Food seemed to be learning the error of its ways and becoming more responsive to the policy recommendations of the FWC, perhaps mindful of its new links with the higher corridors of power. However, this was not to last. Hardy had ended his letter to Hall of 5 April with the prophetic words: 'The next fortnight will enable us to judge the degree of influence we can hope to exert'.⁸⁷ On 16 April the Wheat, Barley and Oats (Prices) Order was issued by the Ministry, fixing maximum prices for these crops. Neither the FWC nor the Ministry's own Scientific Adviser were consulted. The FWC's consistent attitude towards price fixing was that without complete State control of supplies it would be disastrous, as prices would immediately rise to the maximum, hitting the poor hardest. Hardy complained bitterly to Adams, and lamented the fact that the FWC Report on Maximum Prices had arrived too late to Adams for him to do any good.⁸⁸ Hardy continued to send reports to 10 Downing Street⁸⁹ but it was becoming clear that the problem was with the Food Ministry.

⁸⁵ There was some correspondence between Hall and Milner in late April, and Hall sent him two FWC Reports. Milner agreed that Meatless Days were a bad idea, but did not want any further contacts at present. See Hugh Thornton (Milner's Private Secretary) to Hall, 26 April 1917 and Hall to Hardy 27 April, both in RSA, Ms. 530.

⁸⁶ Hardy to Ashley, 11 April 1917, AOP, *op.cit.*

⁸⁷ Hardy to Hall, 5 April 1917, *op.cit.*

⁸⁸ For details here see Stark, *op.cit.*, pp. 142-3. See also Hardy to Adams, 17 April 1917, RSA, *op.cit.* The report in question was 28g in the National Food Policy series, Maximum Prices, issued on 13 April. It was the work of the economist H.W. Macrosty.

⁸⁹ See Hardy to Adams, 25 April, and Hardy to Kempe, 25 April, RSA, Ms. 530.

On the 19 April Hardy had received a very angry letter from Rew at the Ministry. Hardy's new approach of direct communication with the War Cabinet had raised a lot of bureaucratic hackles. It was not correct procedure and tended to diminish the status of the Food Ministry. Rew's letter merits substantial quotation, not only as an amusing insight into the contemporary bureaucratic mind, but as evidence of the political naiveté of the scientists. Here the outsider attempting to network inside the machinery of government is put firmly in his place:

I have this morning received copies of three memoranda dated the 13th instant which have been drawn up by your Committee and sent, I understand, to the Prime Minister. May I venture to remind you that the Food Controller is by Act of Parliament the Minister responsible for the maintenance of food supplies, and that it might be convenient if any recommendations which your Committee desire to make to the Government should be communicated in the first instance to him? It might indeed tend to prevent misconception if you would be good enough to consult us as to the administrative position in regard to the regulation of food supplies and I can hardly say that I shall at all times be very glad to give you the fullest information on any point in which you are interested.

Rew went on to stress that contrary to recent FWC reports, notably that on A Limited Measure of Food Distribution (13 April), there was indeed one body in control of all aspects of food policy, one body which oversaw the collection and presentation of all relevant data before a decision was reached, and that body was the Food Ministry. Rew ended on a particularly offensive note, implying that on the question of price control the Committee was out of its depth:

On the question of maximum prices, I can assure you that all the objections and difficulties are appreciated here, but the policy adopted involves a good many complex considerations in each case which it would take too long to explain.⁹⁰

Hardy replied with barely disguised anger and irony: it was all very well to say that the FWC would be furnished with the fullest information, but what was the use of this when the Ministry had never used its Scientific Adviser as a channel for involving the FWC:

In no single instance was this channel of communication with the Committee used, except with respect to minor technical points, and I believe it is not too much to say that, save for one case when his

⁹⁰ Sir Henry Rew to Hardy, 19 April 1917, FWC Minutes, 24 April 1917 Meeting, in Vol. I, 1916-17, RSA, Cmb. 72.

advice was asked and ignored, Professor Wood, although Scientific Adviser to the Ministry, was not accorded an opportunity of expressing his views upon questions of policy involving scientific considerations.

During the whole of 1917, so far, the Ministry had only even acknowledged one letter (that of 10 February), 'since then no communication to Lord Devonport or to yourself has received even so much notice'.⁹¹ But by this time relations between the FWC and the Ministry had reached a critical impasse. On 20 April the FWC had agreed to ask Wood to 'draw up a Memo. criticising the policy of the Food Ministry'. This was submitted at the same 24 April meeting at which Rew's offensive first letter was read aloud. The minutes for that meeting record no comment on Rew's letter, but that Wood's memorandum was unanimously adopted for publication.⁹² This Memorandum was sent directly to the War Cabinet and the Food Ministry. It consisted of a scathing attack on the methods and policies of the Ministry, and in particular its lack of attention to the critical scientific aspects of food problems:

The public announcements of the Ministry from the first appeared to show a neglect of relevant scientific principles. Elementary and fundamental physiological and economic considerations were ignored, and the Committee, to avoid the charge that a body of experts had remained silent in face of measures which they knew could result only in harm, decided, though with reluctance, to go beyond questions of a technical character and to address themselves to broad policy. Memoranda were prepared and copies sent to the Ministry of Food and to other Government Departments. So far as the Ministry of Food is concerned, they appear to have failed in their object. The Committee are forced to this conclusion by their observation of the policy adopted, which appears to be concentrated on hasty attempts to reduce consumption imperfectly co-ordinated with measures for extending the bread supply; and to be applied almost exclusively to the comparatively small number of the well-to-do, rather than to the millions of workers for whom bread is the main source of working power.⁹³

The rest of the Memorandum went on to 'make an emphatic protest against those parts of the Food Controller's policy which...are paving the way for disaster'. The 'main point at issue' was that Devonport, 'in framing his policy, has ignored the fundamental fact that the efficiency of the manual worker depends as directly upon his supply of food as does the

⁹¹ Hardy to Rew, 24 April 1917, FWC Minutes, 1 May 1917 Meeting, *op.cit.* Both the first long, and the following short quotations here are from this letter.

⁹² FWC Minutes,

⁹³ FWC report 28h, The National Food Policy, 24 April 1917, P.R.O., War Cabinet Minutes, 24/12/G.T. 550.

mileage of a motor car upon its petrol'. The Food Ministry had over-emphasised the need to decrease consumption with its Voluntary Rationing and Meatless Days policy. Such a policy failed to realise that there was a basal level of necessary consumption if work was to be done efficiently. Moreover applying this policy indiscriminately to both meat and bread had only served to increase the demand for precious bread, as the poor could not afford meat. The Memorandum also criticised the Food Controller for his delay in diverting the supplies of barley exclusively to bread-making (though, as we shall see, this was War Cabinet procrastination), and price-fixing without adequate State control of production and distribution.⁹⁴

Replying on 26 April, Rew wrote to the War Cabinet and refuted each point specifically. In his opening paragraph he put his finger on the central problem in the relations between the FWC and the Food Ministry:

The main point of the attack made by the Food (War) Committee of the Royal Society on the Ministry of Food, appears to be that they have not been regarded as the dictators of the National Food Policy.⁹⁵

In a dig at his audience, he also made the point that 'In concentrating their attack upon the Food Controller the Committee overlook, or are unaware of, the fact that in its main lines, and to a considerable extent in its details, the policy adopted is that of the War Cabinet'. Rew ended by reasserting the right of the Government, and only the Government, to make policy:

Generally this report can only be described as cavilling without being helpful. It mainly deals not with those matters on which the Members of the Committee are eminent authorities, but with questions of policy which the Government must decide in the light of their full knowledge of the facts as to present and prospective supplies of various kinds of foodstuffs, both for this country and the Allies, and of the bearing of food regulations on other aspects of their general policy. The advice which the Committee have offered from time to time has been considered with due respect by the Ministry of Food, and if it has not always been implicitly or immediately followed, for reasons which may not be always apparent, it has nevertheless been of great assistance in dealing with the complex questions which are involved in any attempt at Food Control.⁹⁶

⁹⁴ Ibid.

⁹⁵ Sir Henry Rew, The National Food Policy (Observations by the Ministry of Food on the Memorandum by the Food (War) Committee of the Royal Society, dated 24 April 1917 G.T. 550, 26 April 1917, P.R.O., War Cabinet Minutes, 24/12/G.T. 609.

⁹⁶ Ibid.

After this exchange, Rew attempted a conciliatory meeting in late April/early May. At this meeting, Hardy again tried to establish ground rules for the relationship between Committee and Ministry. He noted in the FWC minutes that:

It was agreed

- a.) that advice can be given only in return for complete confidence; it can be based only on full information;
- b.) that the chief scientific officer should be in a position to report directly to the responsible Minister;
- c.) that the scientific staff should be consulted before action is taken;
- d.) that the scientific staff in the Ministry should at least include an economist and a physiologist.⁹⁷

However, relations did not improve. Paton wrote to Hardy at the end of April demanding that the position of the Committee with regard to the Food Ministry should be the, 'urgent business' of the next meeting: 'This is becoming ridiculous. We are supposed to be an advisory committee, but our advice is not asked and when it is given it is disregarded'.⁹⁸ He attached a note for discussion on the position of the Committee. This makes it clear that confusion still reigned in the minds of Committee members as to the exact status and degree of influence of the Committee. Paton was not certain whether the FWC had ever been a Committee of the Privy Council, whether it had ever been officially appointed as an advisory committee to the new Food Ministry at the beginning of 1917, or whether the FWC had merely assumed that this was the case as it had been asked to nominate a Scientific Adviser to the Food Ministry. Paton thought the time had come for an end to amorphous informal relations, and to establish once and for all an official relationship. He proposed three courses of action: either dissolve the FWC entirely; 'secure for it such an official position as will guarantee that its recommendations are considered'; or act as an outside watchdog, continually sniping at the Ministry.⁹⁹ In this latter context Paton soon also pressed for the publication of the Memorandum of the 24 April to show to the public that 'scientific advice has been given and disregarded'.¹⁰⁰ Hardy was still attempting to do exactly what Paton has suggested, and establish an official relationship, or at least a recognised advisory procedure.

⁹⁷ FWC Minutes, 1 May 1917 Meeting, RSA, Cmb 72.

⁹⁸ Paton to Hardy, 29 April 1917, RSA, Ms. 530

⁹⁹ Paton, enclosure with *Ibid.*, 'Note'.

¹⁰⁰ Paton to Hardy, 19 May 1917, RSA, Ms. 530.

¹⁰¹ But things had by now got so hot that Flux, who was at the Board of Trade, felt he had to resign temporarily from the Committee, particularly while publication of the Memorandum damning the Food Ministry was still in the air. His resignation letter spoke of 'The change in relations of your Food (War) Committee to the Food Controller, from that of a friendly adviser, to that of a more or less hostile critic'. He regretted that:

The customary inter-Departmental courtesies must bar me from taking a share in such an open and frank challenge of official policy as the Committee now feels to be its duty, and while the Committee deems such action necessary, it will not be possible for me to act as a representative on the Committee of this Department.¹⁰²

Thompson too had considered resigning as Scientific Adviser, but Rew had persuaded him to stay his hand. Thompson now wrote to Hardy complaining bitterly of his own treatment inside the Ministry:

....he [Devonport] has never seen me on any subject, nor have I ever spoken to him. The thing is so marked that I have come to regard it as a fixed purpose on his part not to have any personal communication with his Scientific Adviser or advisers.¹⁰³

Hardy was now faced on all sides by resignations, and by Paton urging direct and public action to criticise the Ministry. He had the unenviable task of trying to steer a moderate middle course while still pressing for a formalisation of the relations between FWC and Ministry, a battle he had fought for so long by various means without resorting to open warfare, which was anathema to the constitution of the Royal Society. As its Biological Secretary he could hardly resort to it, even under such provocation. He had also proved himself politically resourceful, if a trifle naive, in the kind of avenues of influence he had explored. He must have known that to go public now would be the last thing to endear the Royal Society to Government, and would have spelt an end to any possibility of influencing policy. However, Hardy had one thing on his side. He sensed, probably through various contacts inside the Government, that a change of Food Controller was imminent. He had hinted as much in trying to calm Paton in his letter to him of 8 May: 'The general position with respect to the Ministry of Food is still obscure. There is no doubt that changes will take place; the policy of the Ministry is to undergo alteration and there may be drastic changes in

¹⁰¹ See Hardy to Rew, 3 May 1917, reproduced in full in FWC Minutes, op.cit., 11 May Meeting.

¹⁰² Flux to Hardy, 1 May 1917, ibid.

¹⁰³ Thompson to Hardy, 11 May 1917, RSA, Ms. 530. Original emphasis.

its personnel as well'.¹⁰⁴ By 21 May he was even more candid. Again to Paton, he argued that whoever was the Food Controller, the Royal Society must not engage in a public fight, but added that,

The Prime Minister had an interview with Devonport and Rew and I understand, spoke his mind very strongly on the subject. The public signs of a change of policy are obvious and I do not think one could expect more than has been done unless there is a change of Minister.¹⁰⁵

Devonport did indeed resign on 1 June 1917¹⁰⁶, and after some delay (during which Ashley was one of those considered for the position of new Controller¹⁰⁷) Lord Rhondda, an ex-businessman then President of the Local Government Board, was persuaded to take on the onerous position on 15 June. Hardy wasted no time in meeting with the new Controller on behalf of the FWC, and found him from the first more willing to listen to them. Hardy wrote to Ashley on 23 June 1917:

I had some conversation with Lord Rhondda yesterday, which may be summarised by saying that he feels himself lost in face of the problem confronting him, and yet driven by the pressure of public opinion to act. He looks to the Committee to give him the lead. He finds the machinery of the Department disorganised, and his first work will be to try to get it into shape....I shall ask the Committee to devote itself to thinking out what can best be said that will be most helpful to a man who confessedly has the whole business to learn.¹⁰⁸

Rhondda told Hardy that he wished to spend some time working out a price-fixing policy, and Hardy's comments on this to Ashley encapsulate the aims of the 'scientists' as we have examined them here: 'If we can carry him so far, we may then induce him to do what the Germans had to do, namely constitute a committee of experts to consider the question'.¹⁰⁹ Ashley and the rest of the FWC met Rhondda on 25 June. Ashley stressed to the new Food Controller the need for co-ordination and consultation between relevant departments. He also seems to have suggested the idea of a Food Council, on which he was later to serve.¹¹⁰

¹⁰⁴ Hardy to Paton, 8 May 1917, *Ibid.* My emphasis.

¹⁰⁵ Hardy to Paton, 21 May 1917, *Ibid.* My emphasis.

¹⁰⁶ Beveridge, *op.cit.*, p. 49.

¹⁰⁷ See Hardy to Ashley, 12 May 1917, AOP, 42,244B, f.133. During late May and early June, the post was also offered to the miners' leader Robert Smillie, to Dr. Christopher Addison, then Minister of Munitions, and to various others. See Beveridge, *op.cit.*, p. 49-50. In fact the Cabinet had a hard time finding anyone willing to take the post.

¹⁰⁸ Hardy to Ashley, 23 June 1917, AOP, *op.cit.*

¹⁰⁹ *Ibid.*

¹¹⁰ Ashley, 'Notes for Interview with Lord Rhondda, June 25 1917, *Ibid.*, f.154, and Ashley to Hardy, 26 June 1917, RSA, Box 530.

During the meeting Hardy brought up his suggestion that an expert committee should be set up by the Ministry to calculate the related values of different foods as a basis for price-fixing. He suggested the members should be Ashley, Middleton from the Board of Agriculture, Wood, MacCrosty and Flux from the Board of Trade, and Rew.¹¹¹ But Rhondda asked the Food (War) Committee to do all the calculations for him.¹¹² The finished memorandum was to be submitted to Ashley, 'for economic criticism'.¹¹³

Ashley felt that the FWC had in the future 'a big role to play in definite physiological questions',¹¹⁴ and relations with the Food Ministry do appear to have eased after Rhondda's appointment. The Food (War) Committee Minutes reveal a greater willingness to consult the Committee on matters ranging from the official publication of food articles by one Dr. Spriggs (the Committee felt they were out-of-date and advised against), to a request from Rhondda to 'submit a detailed plan for following closely the food stock of the country'.¹¹⁵

4.3. INFLUENCE ON POLICY: BREADSTUFFS AND BREWING

Before concluding this chapter, I want to offer some thoughts on the degree of influence that the FWC achieved. This will obviously necessitate a break in what has been a chronological structure.

It has been already noted that the FWC consistently advocated what became known as the 'breadstuffs policy' to be the guiding principle of all food strategy. This theme was present in the early Report on the Food Supply of the United Kingdom, and continued to be stressed in the series of memoranda on national food policy. Beveridge later described this policy as,

in its most general terms, that, whatever else was allowed to be in short supply, whether for human or animal consumption, there should be a sufficiency of breadstuffs to meet in full all demands for them without rationing.

¹¹¹ See Hardy to Rhondda, 23 June 1917, RSA, Box 530.

¹¹² See Hardy to Hall, 27 June 1917, Ibid.

¹¹³ Hardy to Middleton, 28 June 1917, RSA, Box 530.

¹¹⁴ Ashley to Hardy, 26 June 1917, op.cit.

¹¹⁵ See Food (War) Committee Minutes, op.cit., pp.102-18 (13-27 July meetings).

Beveridge speaks of these ideas as becoming the basis of government policy under the first two Food Controllers,¹¹⁶ and describes the breadstuffs policy as becoming 'the dominant note in British Food Control'. He added that: 'It may first be seen taking shape in the published report [on U.K. food supply] of the Food (War) Committee'.¹¹⁷ As a civil servant, in writing the history of British food control Beveridge not only chose to ignore any impact of the later reports which consistently recommended this policy, but even went so far as to state of the breadstuffs policy that:

neither...[in the report on the U.K.] nor, to my knowledge, anywhere else during the war, was it promulgated in express terms or orderly sequence. The underlying principle has to be gathered from its different practical applications - maintenance of full cereal supplies, lengthened extraction of wheat, dilution with other grains and their restriction to human food, efforts to reduce flocks and herds, and restriction of imports of feeding stuffs.¹¹⁸

Both the underlying principle, and all these practical applications, and more, were, however, contained in the reports of the Food Committee from 1916 onwards. But how much influence did they have, especially considering Beveridge's damnation of them with faint praise? Certainly an examination of the contemporary organisational structure of the Ministry of Food also seems to indicate that the Ministry viewed food, as we saw Starling later argue, more in terms of the economics of supply, demand and distribution than of science. The official Scientific Adviser (Wood and later Thompson) attached to the Intelligence and Statistical Section of the Secretary's department did not loom large in the massive organisational structure.¹¹⁹ However, all this means is that influence was not as formalised as the scientists themselves wanted. We must therefore look more closely, and at informal contacts and channels, to discern evidence of scientific influence over policy.

A good illustration of this point may drawn from the debate about policy on the restriction of brewing and distilling in the Ministry in late 1916 and early 1917. The use as food of the materials such as barley used in brewing and distilling had been suggested in the third part of the FWC's report on the U.K. food supply on 29 October 1916.¹²⁰ Brewing was initially limited by the Output of Beer Restriction Act of 3 August 1916, though this was a

¹¹⁶ W.H. Beveridge, British Food Control, (London, OUP, 1928), pp.16-17.

¹¹⁷ Ibid., p.83.

¹¹⁸ Ibid., pp. 83-4.

¹¹⁹ See Beveridge Papers, Misc. Vol 92, Collection on Food Control, Vol. XII, op.cit. passim.

¹²⁰ See Beveridge, op.cit., p.17 and Stark, op.cit., p. 130.

measure conceived to save on tonnage of imports rather than to increase the food supply.¹²¹ During late 1916 and early 1917, the Ministry was keen to reduce brewing further. The stimulus was the forthcoming reports of the FWC which argued for the use of brewing materials directly as human food. The idea was to use barley, and other grains used in brewing, not as animal feed but to dilute flour further. This policy, the FWC argued, would most efficiently exploit the maximum levels of protein and energy in the grains. What is most interesting is the channels of influence between the FWC and the Ministry. The crucial contact, rather than the Scientific Adviser himself (Wood) was A. W. Flux, a statistician on the staff of the Board of Trade (and, significantly, as was noted above, a member of the FWC since early 1916). His unique position gave him access to the deliberations of the FWC, even before the final draft of their report on brewing and distilling had been ratified.¹²² Flux wrote two memos on 14 December 1916 to Beveridge in the Food Ministry. They both suggested, on the basis of the forthcoming FWC report (Flux's draft copy of which was attached) that it would be useful to reduce brewing and to use the materials directly for human food: barley could be used for bread-making by the dilution of wheaten flour:

The question of economy by reduction of brewing turns on the destination of the materials....The Royal Society are satisfied, as I believe others also who have experimented are satisfied, that barley meal may quite well be mixed with wheat up to 15 per cent in the manufacture of bread without inconvenience.¹²³

The annexed FWC draft argued with scientific persuasion that barley should be used not for brewing, nor livestock feed, but for diluting flour as:

The beer together with the by-products of the brewery contains between 27% and 58% of the energy and less than 27% of the protein of the original material, whereas if these materials were not brewed but utilised in the theoretically best possible manner, about 71% of the energy and 68% of the protein would be recovered as human food. This very high recovery is possible only if the use of the barley and other materials as food for live-stock is equally prohibited. If, as would otherwise be the case, they were converted into meat, only 15% of the energy and 17% of the protein would be realised as human food.¹²⁴

¹²¹ Beveridge, *op.cit.*, p.18

¹²² This report was the Appendix to the third part of The Food Supply of the United Kingdom, and it appeared at the end of 1916. Flux's draft copy is in BPF, Vol. II, 'Brewing Restrictions, Dec. 1916 - July 1917'.

¹²³ Memo by AWF [Flux], to MF, 14 December 1916, 'Brewing and Distilling - Effect of Possible Restriction', item 2. BPF, Vol. II

¹²⁴ Report of the Physiology (War) Committee of the Royal Society on the Food Supply of the United Kingdom. Part III. 4: a Consideration of the Economy in Food which might be effected by the prohibition of Brewing, draft copy approved by Food Sub-Committee on 9 December 1916, and signed by Hardy, BPF, *ibid.*, item 5.

The adoption of such a policy, Flux argued, would reduce tonnage requirements, and enlarge food stocks, especially if adopted in conjunction with another suggestion from the FWC: reducing the number of meat-yielding animals. Their food could be diverted to human use, again in bread-making, and their slaughter would mean more meat for human consumption.¹²⁵ In his account of British Food Control, Beveridge overlooked the fact that he had received such advice from the FWC via Flux. He wrote only that:

A fifth heading [in the third part of the report on the U.K. food supply which suggested food economies] - diversion of certain quantities of material used for stock feeding to human food - was named by the Committee, though not developed in the published report.¹²⁶

The FWC's analysis and recommendations, as communicated via Flux, also found their way into two other important memoranda. The first came from H.G. Paul of the Food Ministry. His 'Provisional Proposals in regard to Beer and Spirits' discussed the various uses of home-grown barley and noted that,

...in this connection the conclusions of the Royal Society's Committee on Food Supplies [sic] are of great importance. The Committee summarises the comparison between the various possible uses of brewers' materials [and here the above quote from the draft report is reproduced]....If this view is accepted it will be necessary to follow up the restriction of brewing by the issue of Orders limiting the uses to which the surplus barley may be put.¹²⁷

We can clearly see the influence of the FWC on brewing policy in the Memorandum prepared from the above information at the request of Devonport, by Beveridge.¹²⁸ This proposed to reduce brewing to 50% of 1915 output (43% of pre-War) releasing 400,000 tons of barley, 26,000 tons of grits (maize) and 55,000 tons of sugar. This, the memorandum argued, would save tonnage and leave home-grown barley for diluting bread. Beveridge took as his conclusion the recommendations of the FWC, and even enclosed the extract of their report reproduced above, proving scientifically the most efficient use of brewing materials as human food: 'It will make unquestionably better use of the food

¹²⁵ See the 'very private' Memorandum to form the basis of a future report considered and adopted at a meeting of the Food Sub-Committee held in the rooms of the Royal Society on Saturday December 9 1916, which was also enclosed with Flux's memo. of 14 December. In his British Food Control, Beveridge overlooks the fact that he received this, saying only that 'A fifth heading [in third part of the report on the U.K. food supply which suggested food economies] - diversion of certain quantities'.

¹²⁶ Beveridge, British Food Control, p.17.

¹²⁷ H.G. Paul, 'Provisional Proposals in Regard to Beer and Spirits', BPF, op.cit., item 1.

¹²⁸ Beveridge, 'Restriction of Brewing', Memorandum prepared for Lord Devonport at his request, presented to Devonport 1 January 1917, BPF, ibid, item 14.

value of the barley than is done in brewing (see extract from Report of the Royal Society Committee)¹²⁹ Beveridge had also added an 'Appendix of Possible Objections and Answers' for his chief. If the cry went up that beer itself was a food, preserving much of the nutritive value of its constituent materials, Beveridge advised the deployment of the scientific proof above:

On this point the conclusion of the Food Committee of the Royal Society, in their report just presented, is of great value.[here he cites that paragraph again]....If therefore the barley is not kept mainly for human consumption a measure for restricting brewing will undoubtedly be attacked with some force as wasteful of food. If the barley can be used mainly for mixing with wheat flour, the scientific argument is conclusive against brewing.¹³⁰

Devonport based his policy on this memorandum and wrote to the Chancellor (Bonar Law) on 5 January 1917, notifying him of his intention to further limit brewing to 50% of 1915 levels and to prohibit beer exports. The Food Controller wanted to 'make an announcement early next week'¹³¹ of these forthcoming changes, but, as Barnett has demonstrated, the decision was delayed by a War Cabinet embroiled with the brewing lobby.¹³²

Devonport was allowed to announce the new restrictions on 29 March, and they came into force on 1 April. The control of the uses of cereals was soon achieved by orders of 20 April 1917 by which the State began to take over the flour mills, and directly restrict the use of wheat and rye to seed and bread-making. The structure of control was completed under Rhondda with orders taking over the remaining mills and limiting the use of barley and dredge corn of 15 August and 17 November 1917. As Beveridge later noted: 'Sound wheat, rye and barley, unless used for seed, could not go anywhere except into the hands of the Government through the controlled flour mills'. Rhondda even went so far as to use price fixing to stop deliberate damaging of grain and subsequent sale for profit as animal feed. The price of such grain was fixed at seven shillings below its sound counterpart.¹³³ It seems then that the reports of the FWC, on this aspect of the breadstuffs policy at least, had considerable influence.

¹²⁹ *Ibid.*

¹³⁰ *Ibid.*

¹³¹ Devonport to Bonar Law (copy), 5 January 1917, with item 14, *Ibid.*

¹³² See Barnett, *op.cit.*, p.106.

¹³³ Details in this paragraph taken from Beveridge, *British Food Control*, p. 34 and pp. 106-7.

However, the critical factor which made the Government turn its attention to food policy was undoubtedly the intensification of the German submarine campaign from the Autumn of 1916 ¹³⁴ and the consequent heavy losses of food cargoes, as well as the rising price of food. Another factor in leaving bread un-rationed was clearly the fear that restriction would lead to social unrest, as the Labour leader, Arthur Henderson had warned.¹³⁵ His advice, coinciding with that of the FWC, may have focused the minds of the Cabinet and the Food Controller on devising a more scientific policy for food. What can be said generally about the influence of the FWC, and what Starling did say with hindsight in 1919, was that once the Government became more food-minded, at least much of the statistical work had been done by the Royal Society and was ready to be incorporated into policy:

The great value of science to a country is that it gives prescience; and our Government might have fared ill in their attempt to provide for the population as a whole, if the contingency of a food shortage had not been foreseen by the chief organ of science in this country - viz.- the Royal Society - so that a whole array of facts was at the disposal of the Government as soon as they were convinced of the necessity of taking up this new war burden.¹³⁶

4.4 EPILOGUE AND CONCLUSION

The FWC now enjoyed until the end of the War a much more satisfactory working relationship with the Ministry of Food, and had less need of other avenues of influence, though it still continued to send its reports to a variety of Government Departments and the War Cabinet. Starling, who took over the Chairmanship of the Committee, wrote in 1919 that:

It was not, however, till the appointment of Lord Rhondda as Food Controller in June 1917 that scientific principles obtained their proper place in the determination of policy....From this time on the Royal Society Committee acted practically as a scientific consultative committee in all matters of food supply; the close co-operation between the Food Ministry and the Committee being secured by the appointment of Sir William Thompson as Scientific Adviser to the Ministry.¹³⁷

This is obviously itself partly rhetorical: although the FWC had a better relationship with Rhondda's food administration, it was never officially recognised as part of the governmental

¹³⁴ See David Lloyd George, *War Memoirs*, (Popular Edition, 2 Vols., London, Odhams, 1938), p.670.

¹³⁵ See *Ibid.*, p. 1159. This point is made by Barnett, *op.cit.*, p.111.

¹³⁶ Starling, *op.cit.*, pp. 6-7.

¹³⁷ Starling, *op.cit.*, pp. 12-13.

machinery. Negotiations for a more formalised position continued right up till the end of the war. The difference with Rhondda¹³⁸ was one of personal style, rather than of structural differences in the machinery of food control. He was more willing to delegate responsibility to his civil servants (hence Beveridge's praise for him), and to take advice from the FWC (hence Starling's). However, no official relationship was ever arrived at, and thus no precedents for formalisation were set for expert influence over policy in the post-War years. At the end of the war the FWC made efforts to continue its work and formalise its advisory position within the machinery of government, either as a new national institute of human nutrition research, or as a part of the Medical Research Committee (later Council). These came to nothing, although some of the FWC's work was continued by Hardy at the new Food Investigation Board of the DSIR.¹³⁸ After the war, Hardy was one of the key trusted individuals who, as was argued at the start of chapter three, served to co-ordinate the research activities of the various government sponsored scientific centres, in the absence of any central co-ordinating machinery for all aspects of civilian research.

However, what is most important from the above for present purposes, is that the scientists, as their public rhetoric argued, struggled for a formalisation of the relations of outside expertise and government, which would install them as an officially recognised and important part of the machinery of government, with a strong voice in the making of policy. It is too early to conclude whether the FWC were adhering to the Royal Society model for influence described in chapters two and three, or rebelling against it. As was stated at the outset of this chapter, very little work has been done on the role of the Royal Society in the war in the area of food, and almost none in any other area (with the possible exception of gas research). What can be said is that the leading members of the FWC (mainly Hardy, Paton and Ashley), primarily wanted the committee itself, rather than any new Government body, to become the formalised centre of food policy. The FWC formalised its relations as far as it possibly could in this direction, but when it could go no further, it developed other, more informal channels of advice to get its message across, and enable the maximum influence to be brought to bear on food. This does to some extent conform to the Royal Society model.

¹³⁸ See Eric Hutchinson, 'A Fruitful Cooperation between Government and Academic Science: Food Research in the United Kingdom', *Minerva*, Vol. 10, (1972), pp. 19-50; Sally Horrocks, 'Consuming Science: Science, Technology and Food in Britain, 1870-1939', Ph.D. thesis, University of Manchester, 1993, chapter six (I am grateful to the author for an advance copy of this chapter).

This also had formalisation as the goal, but when formalisation could proceed no further, it favoured continuing by more informal methods. Certainly the post-War history of the FWC followed this path. The FIB, with Hardy at its head, was one of the new bodies, as was argued earlier, which together formed, through their eminent chiefs, a scientific power-base within the machinery of government. Informal contacts between the heads of these new bodies could result in large areas of policy being effectively controlled by scientists. But, the strategy was a risky one since it relied on key personnel to hold off the influence of the generalist State. This was not an acceptable long-term policy.

As was noted above, it was not only scientists, but also an economist who were arguing for formalisation. In the next three chapters I will examine more closely the public science of British economists and show that Ashley, with his positive public science was in a minority position.

CHAPTER FIVE

ALFRED MARSHALL AND THE RELATIONS OF ECONOMISTS AND POLICY-MAKING IN LATE NINETEENTH AND EARLY TWENTIETH CENTURY BRITAIN

The previous chapter illustrated the public science of scientists in action. Scientists were observed actively pressing for a formalisation of their executive policy-making powers. But not just scientists: W.J. Ashley was also seen to use the same type of public science arguments to argue for a formalisation of scientific and economic input into policy. Following on from this, I want to argue in this chapter that the formalisation of influence over policy was a characteristic feature of the professionalisation of economics, as well as of science. Ashley's position will be explored in detail in chapter six, but first it is important to establish how this contrasted with the dominant attitude in British economics in this period towards involvement in policy-making.

I will argue that in the years immediately after taking up his Chair at Cambridge in 1885, Alfred Marshall set about a campaign to professionalise economics in Britain, and that central to this process was a strategy to obtain influence over policy-making. However, unlike the scientists, this strategy was not geared to winning immediate influence, but influence in the longer term. Marshall knew that economics was not at the same level of professionalisation as science, it did not yet even have a methodological consensus. Marshall's strategy for professionalisation involved imitating the professionalisation of science in the nineteenth century. The (rigorously scientific) methodology, nature, and scope of the discipline had to be established and agreed, and economics had to become a university-based discipline with a clearly defined area of expertise. The visible trappings of professional status had to be gained: a discrete examination system, professional body and academic journal. Finally a new framework or general theory, within which all types of economist were willing to work had to be formulated and accepted. Only when professional status had thus been built up, openly using the model of the scientific profession, could economics, according to Marshall, hope to acquire the social and cultural authority that

science was perceived to have acquired in the years of populist scientific naturalism.¹ Only when this kind of authority had been earned could economists openly attempt to formalise their position in the policy process, as we observed scientists doing. Until such time Marshall's strategy insisted that economists standardise a negative form of public science. Thus almost every public utterance of Marshall somewhere contained a familiar rubric which stressed the inability of economics to give definite policy recommendations and the lack of any desire to do so. Rather than arguing technocratically, that their scientific method could give a certainty to policy decisions, Marshall desired that economists should claim to want to preserve a distance between their science and politics (in the short term) to maintain the scientific accuracy of their subject. However, this strategy did not bar economists from giving policy advice, as long as they did it through private informal channels. Overall, this strategy fitted in well with the cautious attitude of the British State to outside expertise in this period: they should be on tap but should not be seen to be on top.

Some work has, of course already been done in this direction. This existing literature has already begun to answer Margaret Schabas' call (which I noted in my introduction), for a new history of economic thought, employing more of the approaches already common in the history of science (a tradition which I have, of course, heavily leaned towards in my treatment of scientists here). Thus A. W. Coats and John Maloney have argued that Marshall's activities should be interpreted as an attempt to professionalise economics.² Maloney has added a theoretical dimension to his analysis, claiming that Marshall saw the development of welfare economics as the theoretical corollary of his unification of economics, and as the development of a science of economic policy. The equation of economic welfare with total welfare, present in Marshall, but theoretically completed by his Cambridge successor, Pigou, created a broad framework or 'research programme'³ within which a diversity of economists could work, and provided an interface

¹ On science see, for example, F.M. Turner, 'Rainfall, Plagues, and the Prince of Wales: a Chapter in the Conflict of Religion and Science', *Journal of British Studies*, Vol. 13, (1973-4), pp. 46-65; 'The Victorian Conflict between Science and Religion: a Professional Dimension', *Isis*, Vol. 69, (1978), pp. 356-376; and 'Public Science...', *op.cit.*

² Coats has written numerous articles over many years on various aspects of the professionalisation of economics, and its political involvements. The most useful articles are cited throughout this chapter, but a more complete list appears in my Bibliography. Recently Coats has had the first part of his collected articles published as *On the History of Economic Thought*, (London, Routledge, 1992). Two further volumes (one with the focus on methodology and one on sociology) are imminent; Maloney, *Marshall, Orthodoxy and the Professionalisation of Economics*, (Cambridge, CUP, 1985) and 'Marshall, Cunningham and the Emerging Economics Profession', *Economic History Review*, Vol. 29, (1976), pp.440-51.

³ Maloney, *Marshall, Orthodoxy...*, *op.cit.*, pp. 181-5.

between theory and practice, giving economics the theoretical justification to make policy recommendations. Alon Kadish has charted in detail Marshall's manoeuvrings towards the various visible trappings of professionalisation, and has set this in the context of the contraction of economics to exclude economic history.⁴ Gerard Koot has painstakingly examined the heterogeneous community of the economic historians and has noted the political agendas of its members, but not how these were to be translated into practice.⁵ Very recently, Kadish, along with Keith Tribe, has brought together a useful selection of scholarship exploring how economics established itself as a part of the curricula of British universities.⁶ Collini, Winch and Burrow have concentrated on indicating the imperialistic nature of Marshall's subsuming of the various strands of economics under a new economic edifice. They suggest that Marshall's ultimate aim was for economics to expand to become the social science with public authority on social questions. However, they stress the word social and argue that Marshall had no ambitions to gain influence through the more obvious channels of political power. Instead he sought a slow build up of influence over the longer term by educating the politically important members of the polity like businessmen, trades union leaders, and civil servants.⁷

I want to add to these existing interpretations by arguing, as I have above, that part and parcel of Marshall's professional strategy was the long-term goal of open, formalised policy influence: the same kind of influence for which the scientists have been observed campaigning. I hope to add to the growing debate by exploring the mechanisms for achieving policy influence used by economists, and, utilising the concept of public science, to examine the rhetorical strategies pursued to persuade the British political elite of politicians and civil servants that economists should be considered a valuable resource in the framing of policy.

⁴ Kadish, Historians, Economists and Economic History, (London, Routledge, 1989); See also his The Oxford Economists in the Late Nineteenth Century, (Oxford, Clarendon Press, 1982).

⁵ Koot, English Historical Economics, 1870-1926: the Rise of Economic History and Neomercantilism, (Cambridge, CUP, 1987).

⁶ Kadish and Tribe (eds.), The Market for Political Economy: the Advent of Economics in British University Culture, 1850-1905, (London, Routledge, 1993). This volume presents the fruit of the British contribution to an international project on the development and institutionalisation of economics.

⁷ Collini, Winch and Burrow, That Noble Science of Politics: A Study in Nineteenth Century Intellectual History, (Cambridge, CUP, 1983).

5.1 THE CRISIS OF POLITICAL ECONOMY AND MARSHALL'S ATTEMPT TO REFORGE A UNIFIED DISCIPLINE

The years 1869-80 are generally agreed by historians of economics to have witnessed a crisis in classical political economy. Looking back in 1888, Foxwell⁸ (then Professor of Political Economy at University College, London), identified three major challenges to the nature and scope of economics: 'theoretic criticism, historical method and humanistic feelings'.⁹

The theoretical attack came largely from the marginalists. W.S. Jevons¹⁰ had led a so-called marginal revolution with the publication of his Theory of Political Economy in 1871, attacking the classical theory of value. He asserted that rather than being based on a combination of production costs and existing demand, assessments of value should be based on a mathematical estimation of the marginal utility of a commodity.

Historical economists like Cliffe Leslie¹¹ and William Cunningham¹² attacked what they perceived as the deductive methodology of economics. They argued that economic doctrine was historically specific: the product of a particular time, place and set of economic conditions. Thus classical economics was not justified in claiming universal applicability for its laws. Their ultimate aim was to substitute an alternative body of theory based on the inductive analysis of historical economic trends, although this goal was never realised. As Gerard Koot has noted: 'English historical economics was a historicist critique rather than a historicist effort of building a new system of economic theory'.¹³

⁸ Herbert Somerton Foxwell (1849-1936): historical economist and, with Cunningham, its flag bearer at Cambridge. He became increasingly opposed to Marshall's version of economics. Educated at St. John's College Cambridge, and Fellow of College, 1874-1936. Professor of Political Economy at University College, London, 1881-1928.

⁹ H.S. Foxwell, 'The Economic Movement in England', Quarterly Journal of Economics, Vol. II, (1888), p.87. Cited here from p. 144, Coats, 'The Historicist Reaction in English Political Economy 1870-90', Economica, Vol. 21 (May 1954), pp. 143-53.

¹⁰ William Stanley Jevons (1835-82): Educated University College, London. Professor of Logic and of Political, Mental and Moral Philosophy, Owens College, Manchester, 1866-80.

¹¹ Thomas Edward Cliffe Leslie, (1827-82). Educated Trinity College Dublin. Professor of Jurisprudence and Political Economy, Queen's College, Belfast, 1853-82.

¹² The Venerable William Cunningham, (1849-1919). Educated at Edinburgh Academy, Edinburgh University and Caius College Cambridge. Ordained 1874; Cambridge University Extension Lecturer 1874-8; Lecturer in History 1884-91; Tooke Professor of Statistics, King's College, London 1891-7; Chaplain, Trinity College, Cambridge, 1880-91; Vicar of Great St. Mary's 1887-1908; Archdeacon of Ely 1907-19.

¹³ G.M. Koot, English Historical Economics, 1870-1926. The Rise of Economic History and Neomercantilism, (Cambridge, CUP, 1987), p.2. See also, Coats, 'The Historicist Reaction in English Political Economy 1870-90', op.cit.

The other strand of criticism was more amorphous, but was no less serious. However unfairly, the classical economic writers like Ricardo, Mill and Smith had become associated in the public mind with a utilitarian analysis of economic behaviour, based on the selfish activities of 'economic man' in a free market.¹⁴ The perceived tenor of this analysis became increasingly out of kilter with the growing middle class awareness of, and sensitivity to, the revelations of the squalid conditions of the working classes, brought increasingly into focus by the social surveys of Booth and Rowntree, and by the writings of countless other lesser social investigators, from the 1870s onwards.¹⁵ Such fears were exacerbated by perceptions of Britain's relative economic and social decline in an increasingly tense and competitive international situation.¹⁶ Not only did classical political economy seem unable to address the question of want amidst plenty, but it seemed unable even to guarantee prosperity at all. Economists themselves were largely drawn from the middle classes¹⁷, and were thus alive to such contemporary sensitivities (W.A.S. Hewins¹⁸, Clare Collet and Beatrice Webb were all involved in Booth's survey of the London poor). Furthermore, while classical economics was associated with laissez faire, the period after 1870 saw an increasing trend towards state intervention. Thus the debate within economics was part of a wider ideological shift in British society.

The crisis of economics was heightened by the deaths of Mill in 1873 and Cairnes¹⁹ in 1875, and by the attempted exclusion of economists from Section F of the BAAS by

¹⁴ See Koot *op.cit.*, pp. 10-14, *passim*; Donald Winch, *Economics and Policy*, (London, Fontana, 1972), chapter one, *passim*.

¹⁵ A selection of such contemporary accounts are brought together in Peter Keating (ed), *Into Unknown England, 1866-1913: Selections from the Social Explorers*, (Glasgow, Fontana/Collins, 1981, originally 1976).

¹⁶ See G.R. Searle, *The Quest for National Efficiency*, (London, Blackwell, 1971); See also for example, E.J. Hobsbawm, *Industry and Empire*, (Harmondsworth, Penguin, 1969); and Bruce Collins and Keith Robbins (ed), *British Culture and Economic Decline*, (London, Wiedenfeld and Nicolson, 1990).

¹⁷ See the data gathered by A.W. and S.E. Coats on the educational/occupational background of members of the British Economic Association in this period, in their paper, 'The Changing social composition of the Royal Economic Society 1890-1960 and the Professionalisation of British Economics', *British Journal of Sociology*, Vol. 24 (June 1973), pp.165-187. In 1891 the top three occupations were Businessman (30.9% including banking and insurance); University teacher (18.2, 21.8 including other teaching); and Civil Servant (10.9). Business also accounted for the occupation of 25% of the members fathers. See also their article 'The Social Composition of the Royal Economic Society and the Beginnings of the British Economics "Profession", 1890-1915', *British Journal of Sociology*, Vol. 21 (May 1970), pp. 75-85.

¹⁸ William Albert Samuel Hewins (1865-1931): Educated Wolverhampton School and Pembroke College, Oxford; Director of London School of Economics 1895-1903, and then head of Chamberlain's Tariff Commission; Conservative M.P. 1912-18; Under-Secretary of State for the Colonies 1917-19.

¹⁹ John Elliot Cairnes (1823-75): Educated Trinity College, Dublin. Whately Professor of Political Economy, Trinity College 1856-61; Professor of Political Economy and Jurisprudence, University College, Galway, 1859-65; Professor of Political Economy, University College, London 1866-75.

Francis Galton in 1877, on the grounds that it was unscientific.²⁰ Jevons must have voiced the feelings of many economists when as President of Section F in 1870 he commented (perhaps thinking of the lukewarm reception his pioneering mathematical paper of 1862, 'Notice of a General Mathematical Theory of Political Economy', had received from Section F members, most of whom, rather ironically considering the later events of 1877, probably did not sufficiently understand it ²¹):

There is no one who occupies a less enviable position than the political economist. Cultivating the frontier regions between certain knowledge and conjecture, his efforts and advice are scorned and rejected on all hands. If he arrives at a sure law of human nature, and points out the evils which arise from its neglect, he is fallen upon by the large classes of people who think their own common sense sufficient; he is charged with being too abstract in his speculations, with overlooking the windings of the human heart, and with undervaluing the affections. However humane his motives, he is lucky if he escapes being set down on all sides as a heartless misanthrope.²²

Jevons rehearsed his audience's concerns that political economy had not yet reached the status of a science. He also reminded them that this was the ultimate goal and that the disapproval of physical scientists for political economy was unwarranted:

...they [physical scientists] forget the absurd theories, the incredible errors, the long enduring debates out of which their own knowledge has emerged, and look with scorn upon our economic science, our statistics, or our still more vague body of knowledge called social science, because we are still struggling to overcome difficulties far greater than ever they encountered.²³

Internally fragmented by theoretical and methodological disputes and held in low public and professional esteem, political economy was at a low ebb. But Jevons had pointed to the solution: in order to reconstitute itself as a credible separate discipline and profession with a recognised area of social and cultural authority, political economy had to imitate the professional trajectory of the natural sciences.

²⁰ On this see R.L. Smyth, 'The History of Section F of the British Association 1835-1970. pp.156-175 in N. Kaldor, (ed) Conflicts in policy Objectives. Papers Presented to Section F (Economics) at the 1970 Annual Meeting of the BAAS, (Oxford, Basil Blackwell, 1970), especially pp. 162-3.

²¹ On the reception accorded Jevons in 1862 see Smyth, op.cit., p. 159.

²² W.S. Jevons, 'Economic Policy', address to Section F, Liverpool, September 1870, reproduced as pp. 25-40 in R.L. Smyth (ed.) Essays in Economic Method: Selected Papers read to Section F of the British Association for the Advancement of Science, 1860-1913, (London, Gerald Duckworth, 1962). Quotation from p.26.

²³ Jevons, Ibid.

It was against this background that Alfred Marshall, after having been at Oxford and Bristol, took up the Chair of Political Economy at Cambridge in 1885 and began the clearly necessary work of re-forging British economics as a university-based scientific profession.

The criticisms largely dictated Marshall's agenda for reform. Marshall attempted to synthesise a new neo-classical economics which would contain elements from all the critics of classical economics, but without compromising its basic doctrines or methodology. He incorporated marginal analysis into his theory; added a historical and mathematical dimension to his analysis; infused his economics with an ethical mission to retain but improve laissez-faire capitalism; and stressed the scientific nature of economics.

This reformation of economics was not a gentle compromise, but an attempt to regroup the disparate strands under the firm leadership of a new Cambridge school. Marshall was vexed by the suggestion:

...that I try to compromise between or reconcile different schools of thought... Truth is the only thing worth having; not peace. I have never compromised on any doctrine of any kind.²⁴

Collini, Winch and Burrow have argued that Marshall was pursuing an imperialistic vision of a new economics, which would subsume elements of all critical positions under a new deductive regime. As they have posited:

When Marshall appeared to be making defensive concessions to rival disciplines and methodological perspectives, he was often diluting the claims to knowledge made by their devotees, engaging in a covert process of annexing existing territory to economics, and suggesting ways in which economics, as he re-defined it, provided unique access to undiscovered lands.²⁵

This assertion was certainly true of Marshall's private behaviour. In his private letters he seems to have been very clear that one of the first steps towards establishing economics as an independent academic discipline was to engage in 'boundary work'²⁶ to exclude certain types of economic thinker. His conception of economics was as 'the scientific study of economic facts and contemporary changes, of course, not neglectful of their historical

²⁴ Marshall to J.B. Clark, 24 March 1908, Marshall Papers. Cited from Maloney, *Marshall, Orthodoxy...*, *op.cit.*, p.52.

²⁵ Collini, Winch and Burrow, *op.cit.*, p.314.

²⁶ For an explanation of this term see, Thomas, F. Gieryn, 'Boundary Work and the Demarcation of Science from Non-Science: Strains and Interests in Professional Ideologies of Scientists', pp.781-795, *American Sociological Review*, Vol.48, (1983).

antecedents'.²⁷ The economist should concentrate on 'keeping the head cool and clear in tracing and analysing the combined action of many combined causes'.²⁸ Businessmen and politicians, lay economists, were immediately excluded from the elite. Thus on the cover of an unused draft of his Presidential Address to Section F in 1890, Marshall distinguished between the 'Academic Insider in economics' and the 'Outsider'. In the unused draft itself he speaks of these outsiders, 'those who having a real interest in economics are yet too much occupied with other affairs to be able to study it technically', as 'troublesome' because they:

...take propositions that were intended to be limited and treat them as unlimited. They take sentences out of processes reasoning with preference to particular cases and make them into dogmas...²⁹

For Marshall the insider was the academic economist; an as yet unknown species which he planned to create.

This attitude led to further exclusions. Despite his own intellectual background in philosophy and psychology, as well as in mathematics,³⁰ he had nothing but contempt for those who took economics as part of the Moral Science Tripos. He thought that economics had nothing in common with the abstract nature of philosophy. Describing the academic Jenkyn Jones in a letter to J.N. Keynes³¹ in 1897, he wrote, 'he knows economics as a branch of philosophy i.e. he knows nothing about it!'³²

Also marginalised were the historical economists whose approach though 'infinitely more important than philosophical economics because infinitely more real' was still 'not economics proper'. Marshall thought they had no real grasp of mathematical statistics or advanced economic theory.³³

²⁷ Marshall to J.N. Keynes 30 August 1891, cited from Maloney, *op.cit.*, p.43.

²⁸ From Marshall's inaugural lecture as Professor of Political Economy at Cambridge in 1885, reprinted in A.C. Pigou (ed.) *Memorials of Alfred Marshall*, (London, Macmillan, 1925), p.171. Hereafter this collection will be referred to as *Memorials*.

²⁹ Unused draft of Presidential Address 1890, with comments on cover possibly written at a later date, Marshall Papers. Cited here from Maloney, *Marshall, Orthodoxy...*, *op.cit.*, p.41. This draft went un-used perhaps precisely because Marshall was concerned to re-define economics but could not (yet) afford to alienate 'outsiders', since, at this time there was no new generation of university-trained economists: most of the economics community were 'outsiders' according to Marshall's vision.

³⁰ For details of Marshall's education and early influences see David Reisman, *Alfred Marshall's Mission*, (Houndmills, Macmillan, 1990), particularly chapter 2; and J.M. Keynes, 'Alfred Marshall, 1842-1924', pp. 1-66 in *Memorials*.

³¹ John Neville Keynes (1852-1949): Educated London University and Pembroke College, Cambridge. Lecturer in Moral Science, Cambridge 1884-1911; University Registrar 1910-25.

³² Marshall to J.N. Keynes 16 August 1897, cited by Maloney, *Marshall, Orthodoxy...*, *op.cit.*, p.43.

³³ Marshall to Keynes, 30 August 1891; and May 1889 cited by Maloney, *Ibid.*

5.1.1 MARSHALL AND HISTORICAL ECONOMICS:

Marshall incorporated historical analysis into his magnum opus Principles of Economics, first published in 1890, while damning the work of the historicists with faint praise, and insisting on the primacy of theoretical causal analysis of historical data.³⁴

Marshall pointed out the limited use of the historical approach to his economics in his Inaugural lecture as Cambridge Professor in 1885. He relegated the historical approach to the position of servant to economic science. Mocking those who would have economists 'discard all theories, and ..seek the solution of our economic difficulties in the direct teaching of facts', he objected that: 'the facts by themselves are silent. Observation discovers nothing directly of the actions of causes, but only of sequences in time'.³⁵ In order to interpret bare facts, economists cannot 'dispense with the use of the economic organon: but rather make use of its aid at every step'. Reason must make sense of facts to ascertain the interplay of causal factors. The implication was clear: theoretical models of measurable motives favoured by neo-classical economics were universally applicable as tools to explain past economic practices. The study of economic history 'has done good service' (and we should note the use of the past tense) but 'economic science...will do a great deal more in applying contemporary observations...to explain the economic past...very much as the telescope breaks up a nebula'.³⁶ Marshall concluded that historical economics was but a small part of the work of the professional economist:

Greedy then as the economist must be for facts, he must not be content with mere facts. Boundless as must be his gratitude to the great thinkers of the historical school, he must be suspicious of any direct light that the past is said to throw on problems of the present. He must stand fast by the more laborious plan of interrogating facts in order to learn the manner of action of causes singly and in combination, applying this knowledge to build up the organon of economic theory, and then making use of the aid of the organon in dealing with the economic side of social problems. He will thus work in the light of facts, but the light will not be thrown directly, it will be reflected and concentrated by science.³⁷

Marshall also revealed here the ultimate aim of his imperialistic reformation of economics: it was to create a discipline with so much intellectual and scientific authority,

³⁴ See Robin C.O. Matthews and Barry Supple, 'The Ordeal of Economic Freedom: Marshall on Economic History', pp. 189-213, Quaderni di Storia dell'Economia Politica, Vol. IX, (1991), nos. 2-3.

³⁵ Marshall, p.166, 'The Present Position of Economics', reprinted in Memorials, pp.152-174.

³⁶ Ibid., pp.165-6 and p.169.

³⁷ Ibid., p.171.

that it would be publicly recognised as capable of commenting on social problems. We will return to this underlying theme later.

Following this analysis of the place of historical economics, the original version (1890) of Book I of Marshall's Principles contained chapters on 'The Growth of Free Industry and Enterprise' and 'The Growth of Economic Science'. This prompted a bitter attack from the historical economist Cunningham³⁸ (formerly a History lecturer at Cambridge, now Tooke Professor of Statistics, King's College, London, but still part of the Cambridge community as Vicar of Great St.Mary's). Cunningham thought he could see exactly what Marshall was about:

...the ordinary economist...professes himself extremely interested in History, and like a French King...expresses a wish to do anything he can for it...Economists do not leave it alone; they do not pursue it seriously, but try to incorporate some of its results into that curious amalgam, the main body of economic tradition; and the result is the perversion of economic history.³⁹

But he was powerless to stop Marshall: when Marshall replied, the editor of the Economic Journal, Edgeworth, refused to allow Cunningham any more space in that organ to continue the dispute, and he had to make do with the less prestigious pages of the Pall Mall Gazette.

The dispute between Marshall and Cunningham was partly personal. It dated back to Marshall's ruling at Cambridge in the 1880s that Cunningham must lecture on formal political economy at least one term a year, rather than his usual practice of introducing theory only as and when the need arose.⁴⁰ Even in these beginnings, however, it is clear that it had a wider importance as a dispute about the nature of economics. The denouement came in 1905 when, prompted by Marshall, the Cambridge Economics Board issued a statement posted in Trinity College (to which Cunningham had recently been appointed Director of Economic Studies) that students should not seek guidance from Cunningham as he 'has publicly declared himself to be out of sympathy with the study of Economics as it is pursued by this Board'.⁴¹ Furthermore, in following editions Marshall removed the

³⁸ See Cunningham, 'The Perversion of Economic History', Economic Journal, Vol.II, (1892), pp.493-5, and Marshall's 'Reply', in the same volume.

³⁹ Cunningham, op.cit., p.491.

⁴⁰ See Maloney, 'Marshall, Cunningham ...', op.cit.

⁴¹ Marshall Papers, 7/21, Loose Typed Sheet.

historical portions of his Principles, to Appendices. We may take this action as a final metaphor for his opinions on the value of historical economics, along with his confidence to J. N. Keynes in 1889 that 'men of the historical type', were 'intelligent, more or less earnest, but not very profound'. As he commented in the same letter: 'I want however to keep my hold on the historical men: they are Kittle-Kattle; and yet important'.⁴²

Marshallian hegemony over economics therefore, at least privately, enshrined a vision of a new scientific discipline which was ruthlessly exclusive of all but a homogeneous few conforming academic insiders. However, publicly, Marshall was much more willing to accept a heterogeneous profession and was conciliatory towards those economic thinkers, academic and non-academic, with differing views on the nature and scope of economics. Though he wished to build up an exclusive profession, he could not do so openly without risking a renewal of the methodological debate which simmered just below the surface of economics. In any case most political economists were lay people in Marshall's terms, since economics as a separate university discipline simply did not yet exist. In public, therefore, though not an active compromiser, Marshall certainly did not go out of his way to provoke discord. He was keen to defuse the methodological debate with the historical economists. His public position was conciliatory:

Science, when obtaining new Laws, is said to be inductive; when reasoning from them and finding how they are connected with one another, it is said to be Deductive; its third task, that of verification, has just been described. There has been a controversy as to whether Economics is an Inductive or a Deductive Science. It is both: Its Inductions continually suggest new Deductions; its Deductions continually suggest new Inductions.⁴³

Moreover he discouraged public controversy and shied away from public criticism of his contemporaries, even when they had criticised his work. Leslie Stephen's biographer described how Stephen despised him 'for being all things to all men' and 'never saying a word against anybody however they much deserve it'.⁴⁴ Marshall himself admitted that his

⁴² Marshall to Keynes, May 1889, Marshall Papers. Cited here from Maloney Marshall, Orthodoxy..., op.cit., p.43.

⁴³ A. Marshall and Mary Paley Marshall, Economics of Industry, (London, 1879), p.3, cited here from Koot, op.cit. p.30.

⁴⁴ Noel Annan, Leslie Stephen, His Thought and Character in Relation to his Time, (London, 1951), pp.136-8. Cited here from Coats, p.710, 'Sociological Aspects of British Economics c.1880-1930', Journal of Political Economy, Vol. 75, (1967), pp. 706-29.

public aim was to emphasise what united economists, rather than what divided them, to offset public opinion. To Foxwell he wrote,

The one thing that [Henry George] says which is important, I think, is that economists are -to outward appearances at least- at loggerheads with one another. I would rather put in one brick just where it should be in the slowly rising economic edifice than plant a hundred brickbats with the utmost dexterity between the eyes of Mr. George. (my emphasis)⁴⁵

Another element of Marshall's synthesis, again responding to the criticism we noted above, and attempting to unify the diverse elements of the discipline, was his stressing of the clear ethical purpose and position of the subject.

5.1.2 MARSHALL AND ETHICS

Marshall claimed that the prime motivation behind his entire economic enterprise was the improvement of the lot of the poor under capitalism. While I would not want to question the sincerity of his altruism, I do want to argue that the presentation of this aim as fundamental to his new economic edifice, made it appear particularly responsive to what Foxwell called humanitarian criticism. Marshall succeeded in stealing the thunder of the ethical criticisms of classical economics, while maintaining a commitment to a capitalistic system of society, only slightly moderated by government intervention. Thus another strand of economics was incorporated into his economic edifice with little compromise on doctrine.

Under the combined contemporary influences of Darwinian ideas of social progress,⁴⁶ increased middle class concern for the condition of the masses, and the perceived threat to the status quo from the rise of Socialist ideas and class-based politics,⁴⁷ Marshall, like many other intellectuals of his generation on the political right and left, sought a new third way between Gladstonian Liberalism and the new Socialism. For Marshall this meant tempering liberalism with a secularised version of Christian ethics. Part of Marshall was, as Maynard Keynes later noted, a secular 'preacher and pastor'. This gave

⁴⁵ Marshall to Foxwell, 22 June 1883, cited by Maloney, *Marshall, Orthodoxy...*, *op.cit.*, p. 51.

⁴⁶ See J.M. Keynes, 'Alfred Marshall', in *Memorials*, p.9, for the influence of Darwin on Marshall during his undergraduate career at Cambridge.

⁴⁷ Marshall had great respect for, and was influenced by the ideas of Socialist writers (See for example 'The Present Position Of Economics', pp.155-6; 'The Social Possibilities of Economic Chivalry', pp.33-4, both reprinted in *Memorials*, where Marshall claims to be a form of Socialist himself). He departed from Socialism over the extent of State control and because he felt it lacked 'a principle of progressive improvement' (from his valedictory address at Bristol, in 1881, partly reprinted in Keynes, *op.cit.*, p.16-17).

his Economics the character of an ethical mission. He repeatedly stressed that the aim of his Economics was to improve the lot of the poor within the existing capitalist, free market economic system. As he said on leaving the Principalship of Bristol College in 1881: 'The work I have set before myself is this : how to get rid of the evils of competition while retaining its advantages'.⁴⁸ Perhaps the clearest statement of the ethical mission which informed his work came in a story about his early life he told to Maynard Keynes :

About the time that I first resolved to make as thorough a study as I could of Political Economy...I saw in a shop-window a small oil painting of a man's face with a strikingly gaunt and wistful expression, as of one 'down and out', and I bought it for a few shillings. I set it up above the chimney piece in my room in college and thenceforward called it my patron saint, and devoted myself to trying how to fit men like that for heaven. Meanwhile I got a good deal interested in the semi-mathematical side of pure Economics, and was afraid of becoming a mere thinker. But a glance at my patron saint seemed to call me back to the right path.⁴⁹

In his political, economic and ethical views Marshall was thus a late Victorian liberal intellectual.⁵⁰ A liberal because he firmly believed that technological advance and prosperity were still guaranteed only by the operation of private enterprise in a free market; a late Victorian liberal because he rejected the three intellectual pillars of mid-century political economy. Marshall had followed J.S. Mill in adopting a less harsh, less materialistic, form of Utilitarianism. He also rejected the extreme Laissez-Faire doctrines of mid-century Manchester School popularisers. They had 'twisted' the meaning of Laissez-Faire. It did not mean 'Let Government keep up its police, but in other matters fold its hands and go to sleep'.⁵¹ Rather it should mean 'Let everyone work with all his might; and most of all let the Government arouse itself to do that work which is vital, and which none but the Government can do efficiently'.⁵² Marshall believed that Government did have a positive, if limited, role in society; the duty 'to inspect and to arbitrate', but not to control.⁵³

⁴⁸ Marshall, valedictory Bristol address, *Ibid.*, p.16.

⁴⁹ Cited by Keynes in *op.cit.*, pp.37-8. This picture now hangs in the Head Librarian's office at the Marshall Library, Cambridge.

⁵⁰ See J. Viner, 'Marshall's Economics in Relation to the Man and his Times', *The American Historical Review*, Vol.31, (June 1941), pp.223-35. Reprinted in *Alfred Marshall: Critical Assessments*, edited by John Cunningham Wood, (London, Croom Helm, 1982), Vol.I, Section 2, No. 14, pp.241-255. See also A. W. Coats, 'Marshall and Ethics', in *Alfred Marshall in Retrospect*, (London, Edward Arnold, 1990), pp. 153-177.

⁵¹ Alfred Marshall, p.334, 'Social Possibilities of Economic Chivalry (1907)', *Memorials*, pp.323-346. This is a different version of an article of same name appearing in the *Economic Journal*, March 1907.

⁵² *Ibid.*, p.336.

⁵³ *Ibid.*, p.337.

He further rejected the reduction of human nature to selfish motivations, which was perceived to have been the basis of the work of the older generation of classical economists.⁵⁴ Marshall believed in the possibility of social progress, not through collective but through individual action to reform and improve human nature. He was confident of 'the perfectibility of man'.⁵⁵

5.2 STRATEGIES OF PROFESSIONALISATION: THE BRITISH ECONOMIC ASSOCIATION; THE ECONOMIC JOURNAL; THE TRIPOS; AND THE SCIENTISATION OF ECONOMICS.

With such an ethical agenda, we might expect Marshall to have pressed immediately for influence over policy to translate his concern into legislation. But this would be to forget that as well as constructing a unified economics, Marshall was also concerned to re-forge economics as a respected profession with a generally accepted constituency in policy issues. Not until economics commanded social and cultural authority again could open involvement in policy be risked, lest such exposure produce controversy and emphasise schism, and thus damage the slowly rising 'economic edifice'. Thus during the 1880s and 1890s Marshall was more concerned with putting 'bricks' into this 'economic edifice' by advancing his strategies for professionalisation. These were: firstly to give to economics those trappings which have come to signify the professionalisation process for historians and sociologists: a formal body, a learned journal and a formal examination system; and secondly to stress the scientific nature of economics.

The first of these objectives was obtained with the foundation of the British Economic Association (BEA) in 1890 (it became the Royal Economic Society with the granting of its Royal Charter in 1902), and the accompanying publication, the Economic Journal, which first appeared in 1891. Marshall had put forward the original suggestion to form 'an Association for the advancement of economic knowledge by the issue of a journal...and by such means as the Association may from time to time agree to adopt'.⁵⁶ The inaugural meeting of November 21 1890 agreed to form such a body. From the very beginning, it is clear that Marshall was determined that the new body would stress the unity

⁵⁴ See Marshall, 'The Present Position of Economics', (1885), his Inaugural lecture for the Cambridge Professorship, Memorials, pp.152-74. See especially pp.153-5. See also Marshall, 'The Old Generation of Economists and the New', (1897), in Memorials, pp.295-311.

⁵⁵ Marshall, 'The Present Position of Economics', p.155.

⁵⁶ Marshall, 'The British Economic Association', Economic Journal, Vol.1, (March 1891), p.4.

of economics. Thus there were no plans to hold general discussions of economic questions: 'For such discussions, unless conducted by a very strong Association, might do harm'.⁵⁷ Similarly, there were no formal membership qualifications. This reflected the fact that there were few academic posts specifically dedicated to economics in 1890, and that an organisation whose membership included high profile politicians and civil servants, would stand more chance of influencing public opinion. However, this open-door policy was also part of Marshall's imperialistic vision of a united economics, and this was necessarily a broad church. This policy was reflected in the Association's Journal. Marshall disparaged the rival Oxford-based Economic Review as having been 'started for the purpose of dealing with problems in which ethical and religious questions took the first place, but which had a kernel of economic difficulty in the background'.⁵⁸ But he was quick to counter this possibly divisive low estimation of the value of historical analysis by insisting that the Journal would, nevertheless, include 'all schools and parties'.⁵⁹ He stressed that the Association was not setting up a new orthodoxy, since there was no such thing as an orthodox science. He hoped that all writers and reviewers in the Journal would treat each other fairly and amicably and:

Working in this spirit, he hoped they would be able to promote economic knowledge by fair and frank discussions, while avoiding that waste of effort in bitter and ungenerous controversy which had long impeded progress.⁶⁰

In fact A. W. Coats has noted that the BEA was so heterogeneous that the early numbers of the Journal: '...contained a variety of statements from individualistic, socialistic and Ruskinian standpoints, and comparatively few strictly technical or theoretical articles were printed'.⁶¹

The nature and scope of the new economics was enshrined in the Cambridge Economics Tripos: the guarantor of the future of the Marshallian imperial synthesis.

⁵⁷ Ibid., p.8.

⁵⁸ Ibid., p.4.

⁵⁹ Ibid., p.7.

⁶⁰ Ibid., p.5.

⁶¹ Coats, 'The Origins and Early Development of the Royal Economic Society', pp.349-71, Economic Journal, Vol.78, (1968), p.362. For further analysis of the content of the Journal, and how, in its early years, this reflected Marshall's own position on the nature and scope of economics, see, Keith Tribe 'The Economic Journal and British economics, 1891-1940', pp. 33-58, History of the Human Sciences, Vol. 5 No. 4 (1992). See also all of the articles in J.D. Hey and D. Winch (eds), A Century of Economics: One Hundred Years of the Royal Economic Society and the Economic Journal, (Oxford, Basil Blackwell, 1990).

In a letter to J.N. Keynes in 1902, Marshall confessed that he was afraid lest 'the empirical treatment of economics is completely to oust the scientific and analytical'.⁶² Marshall was concerned to have intellectual heirs to continue the new orthodoxy he was building up:

Put yourself in my position, I am an old man...Economics is drifting under the control of people like Sidney Webb and Arthur Chamberlain. [i.e. historical and political - especially socialist] And all the while...the curriculum to which I am officially attached has not provided me with one single high class man devoting himself to economics during the sixteen years of my Professorship.⁶³ [original emphasis]

When Marshall took up the Cambridge Professorship in 1885, political economy played only a small part in a traditional curriculum dominated by classics and theology. When it was taught, as part of the Historical and Moral Sciences Tripos (though during the 1890s the Historical Tripos was reformed so that students could avoid doing any formal economic theory), it was taught by academics with little background or interest in economics, and had only a minimal place in the examination system. On taking up his post, Marshall bemoaned the fact that political economy was:

the only subject of which the unsystematic study in the University exceeds the systematic, the only one which finds a great portion of the ablest and most diligent students among those who are preparing for, or who have graduated in, Triposes in which it is not represented. I want to supply an Examination which...will help to steady and systematise this unsystematic study.⁶⁴

In June 1903 Marshall got his scheme for a new Economics Tripos accepted by the University. It was very favourably biased in favour of Marshallian economics: half of the first two years and all of the final year was reserved for theory, leaving only one year for applied economics, economic history and political science.

As Koot has commented, this achievement 'signified the triumph of economic theory as a professional discipline at Cambridge'.⁶⁵ As we noted above the tripos was deliberately engineered by Marshall to serve this purpose. Coats notes, quoting Marshall, that:

⁶² Marshall to J.N. Keynes, 30 January 1902, cited here from Maloney, *Marshall, Orthodoxy...*, *op.cit.*, p. 46.

⁶³ Marshall to Keynes, 30 January 1902, cited from Coats, 'Sociological Aspects...', p.713.

⁶⁴ Marshall, 'Letter to the Vice-Chancellor', *Cambridge University Reporter*, (1885-6), p.579. Cited here from Coats, 'Sociological Aspects...', *op.cit.*, p.712.

⁶⁵ Koot, *op.cit.*, p.149.

Marshall's scheme must be seen not merely as a response to the development of economic science, but also as a sign of the emergence of professional self-consciousness among British economists. The new Cambridge curriculum was designed to meet the needs of those who proposed to 'engage in the professional study of economics, and those preparing for careers in the higher branches of business, or in public life'.⁶⁶

Stimulated by Marshall's success with the Cambridge Tripos, and by the popularity of the Principles as a definitive textbook, degree courses and lectureships in economics were set up all over Britain. Oxford set up a Diploma in Economics in 1903 (though an Honours School was not established until 1921 with the Politics and Political Economy School); London, having absorbed the LSE (itself founded in 1895) after the reconstitution of the university in 1898, set up a new Bachelor degree in Economic Science in 1903; Manchester had had an economics chair since 1898, and in 1900 it began a certificate course; Leeds had a chair by 1902; Armstrong College, Newcastle, later the university, established an economics department in 1912; Cardiff in 1906, and the Adam Smith Chair of Political Economy was founded at Glasgow in 1896 with funds from Andrew Stewart, a local ironmaster.⁶⁷

As the historical economist Herbert Foxwell had commented (though with some degree of exaggeration) as early as 1888, the perceived influence of Marshall in unifying British economics was great: 'Half the economic chairs in the United kingdom are occupied by his pupils, and the share taken by them in general economic instruction in England is even larger than this'.⁶⁸

The final element of the professionalisation strategy was the presentation of economics as a science. As well as stressing the importance of mathematical analysis in economics, Marshall did not miss an opportunity to identify the economic enterprise with the methods of the natural sciences. He stated in his first book (co-credited to his wife) that:

Economics is a science because it collects, arranges and reasons about one particular class of facts. A science brings together a great number of

⁶⁶ Coats, 'Social Composition of the Royal Economic Society...', op.cit., p.78. The quotation from Marshall is from his The New Cambridge Curriculum in Economics, (London, 1903).

⁶⁷ Details here from Michael Sanderson, The Universities and British Industry 1850-1970, (London, RKP, 1972). See chapter 7 and pp. 263-75, *passim*. See also Kadish and Tribe (eds) The Market for Political Economy..., op.cit., *passim*.

⁶⁸ H.S. Foxwell, 'The Economic Movement in England', Quarterly Journal of Economics, Vol. II, p. 92. Cited here from Keynes, 'Alfred Marshall...' in Memorials, p. 59.

similar facts and finds that they are special cases of some great Uniformity which exists in nature. It describes this Uniformity in a simple and definite statement, or Law.⁶⁹

In 1885, he was seeking to associate economics specifically with biology and mechanics. He argued that economics was '...an engine for the discovery of concrete truth, similar to...the theory of mechanics'.⁷⁰ By 1898 he was offering a subtler analysis, arguing that, although the early stages of economic reasoning were similar to physics, the later stages resembled biology, and that: 'The Mecca of the economist is economic biology rather than economic dynamics'. He argued that 'economic reasoning should start on methods analogous to physical statics, and should gradually become more biological in tone'.⁷¹

5.3 THE IMPLICATIONS OF PROFESSIONALISATION FOR THE RELATIONSHIP OF ECONOMICS AND POLICY-MAKING: MARSHALL'S NEGATIVE PUBLIC SCIENCE

Cunningham believed that the result of Marshall's professional strategy was that political economy was stripped of any authority on contemporary political problems. He argued that:

Political economy in its new-fashioned form gets beyond the old limitations, but only by becoming more and more of a formal science, the relations of which with actual life are more vague and indefinite than ever.⁷²

Publicly this was true. To maintain the scientific integrity of Economics, economists could furnish no specific policy recommendations, though they could express personal opinions. However, such opinions were expressions of their personal ethical position and did not carry the authority of science. Economics could advise on the effects of different policies, but the ultimate choice of policy was left in the hands of the politician who alone possessed the separate and critical skill of political choice or will. Hence politicians were more likely to seek advice, on an informal basis, from such economists, who seemingly had no pretensions to institutionalised political influence within the machinery of government.

⁶⁹ A. Marshall and M.P. Marshall, *The Economics of Industry*, (London, Macmillan, 1884, first edition 1879), p.2.

⁷⁰ Marshall, 'The Present Position of Economics', *op.cit.*, p.159.

⁷¹ Marshall, p.314, 'Mechanical and Biological Analogies in Economics', 1898, *Memorials*, pp. 312-318.

⁷² William Cunningham, 'Why had Roscher so Little Influence in England', *Annals of the American Academy of Political and Social Science*, Vol.5, (1894), p.7. Cited here from Collini, Winch and Burrow, *op.cit.*, p.267-8.

Marshall's earliest statement of his views on the relationship between Economics and policy was in two articles published in the Labour newspaper The Beehive⁷³ in 1874. In the first Marshall argued that the laws of science differed in kind to the laws of government: they were indicative, rather than imperative. Thus, 'a law of science was simply a statement of the consequences which follow from a given set of causes', it could tell us only, 'that a certain course of action will produce a certain event'.⁷⁴ Economics did not possess 'the power of giving direct and complete answers on points involving questions of right and wrong'.⁷⁵ Marshall stressed the need to 'distinguish' clearly between 'economic investigations' and 'ethical discussions'⁷⁶: between fact and value. He argued that:

...it is absolutely necessary to keep entirely distinct two questions; that which must be decided according to the laws of political economy, viz., what consequences will follow from a postponed [sic] course of action, and that which must be decided by our moral judgements, viz., whether an action which produces these consequences is right.⁷⁷

The consequences of failing to implement this distinction would be twofold: firstly men without the skill or intelligence to understand economic reasoning about causes and consequences, would nevertheless claim the authority of economic science for their moral arguments; secondly, if Economics was used in this public way, it would be debased by the infiltration of moral and political prejudice ('the heat of excited feeling is likely to be introduced unnecessarily at an early stage of the inquiry'⁷⁸), and it would cease to be a science.

In the first chapter of the Economics of Industry, published in 1879, Marshall made explicit the implications of the above argument for the role of the economist in policy-making. Marshall argued that Science was a specialised form of knowledge which could only look at a given question from that specialised viewpoint. Because questions of

⁷³ Original copies of these two articles: 'The Laws of Political Economy: What they can teach and what they cannot teach' Bee-Hive, April 18 1874, and 'The Province of Political Economy', Bee-Hive, May 7 1874, are preserved in the Marshall Papers, Marshall 4 (formerly Marshall 9[5]), Cabinet File 2, Notebook 5 'Method, (including press cuttings of Bristol lectures).' They are also reprinted in R Harrison, 'Two Early Articles by Alfred Marshall', Economic Journal, Vol.73, (1963), pp.422-30, and in Critical Assessments, op.cit., Vol IV, No.106, pp.119-130. The page numbers for the quotations here are from the latter reprint, as the copies in the papers do not have page numbers. See Harrison's article for background on the Bee-Hive.

⁷⁴ Marshall, 'The Laws of Political Economy...', Ibid., p.121.

⁷⁵ Ibid., p.123.

⁷⁶ Marshall, 'The Province of Political Economy', op.cit., p.126.

⁷⁷ Marshall, 'The Laws of Political Economy...', op.cit., p.122. Marshall has corrected his copy to read proposed, rather than postponed, which was a type-setting error by the Bee-Hive.

⁷⁸ Ibid., p.123

government policy needed to take into account a broad range of issues and interests, many of them not amenable to scientific analysis, science could not be a guide to policy, and economic science alone certainly could not. This was the special province of the art of statesmanship:

[a science] cannot claim to be a guide in life, or to lay down rules for the practical conduct of affairs. That is the task...of an Art [which]...considers some important practical end, and directs men in their efforts to obtain it. First it inquires generally into the various conditions of the case. Then taking one of them at a time it seeks out the science whose special business it is to answer questions relating to this particular class of conditions, and demands of this an answer to a question which bears directly on the end in view. Having collected such answers from many sciences, Art puts them together, and says, since we are told by the sciences that such effects will follow from such and such causes, therefore it is best to pursue such and such a course. [my emphasis]

He continued, clearly stating that,

...the Statesman...is a man of Art in a yet broader sense of the term. For he has to consider not only what [a given course] will cost...but also....what will be its indirect political, social and moral effects.

He therefore concluded that:

Economics then cannot by itself be a guide in the practical affairs of life; but it answers a number of difficult questions which must be asked of it by the statesman...⁷⁹

In his lectures during the 1870s as Principal of Bristol College, Marshall emphasised the scientific nature of modern Economics and rejected the idea that 'the science has to do with politics, and that a man takes up the study because he is a Liberal or a Conservative to get weapons with which to serve his party'. He insisted that 'a man must not thrust into the facts that which did not belong to them', although he was free to 'apply the conclusions of his study to politics' if they had been reached through objective analysis.⁸⁰

⁷⁹ A. Marshall and M.P. Marshall, *The Economics of Industry*, (second edition 1884), Book One, Chapter One: 'Introductory'. First quotation from p.3, second and third from p.4. Although I have concentrated here on the implications for policy, Marshall also talks here in the same terms about the relationship of Economics to business decisions.

⁸⁰ Press report of a Bristol lecture, of unknown source, labelled by Marshall, 'Lectures 1, Special Difficulties 3, "Economics and Politics"', in Marshall Papers, 4 (formerly 9[5]), Cabinet File 2, Notebook on 'Method (including press cuttings of Bristol Lectures)'.

Allied to this was Marshall's distinction between his new Economics and the old Political Economy.⁸¹ This use of new terminology is the clearest indication of the emergence of a new grouping around Marshall, which was putting forward its own model of the professional economist as an objective scientist. Evidence of this new usage can be found in his early work the Economics of Industry. He favoured the use of the term, 'Economic Science, or more shortly, Economics.' His reason was that the adjective political no longer connoted the general best interests of the whole nation (as it had when the nation was known as the Body Politic) but those of a particular political group.⁸²

However, Marshall realised that the relationship of economics and politics was a two-way street. Just as he publicly denied the influence of politics on Economics, so he publicly claimed that economic theory could not be closely linked with policy-making. For this reason Marshall stressed the difference in kind between the functions of economic knowledge (specialist knowledge gained through 'patience...training..[and] intelligence'⁸³) and those of political experience (generalist knowledge gained through experience of political processes). As he noted in 1877:

...political economy is abused when anyone claims for it that it is itself a guide in life. ...What political economy will enable us to do is to show men the grave evils they are inflicting on others; but when that is done all we can say is - do unto others what ye would that they should do unto you. Political economy will help us rightly to apply the motive force of duty, but the will to do one's duty must come from another source.⁸⁴ [My emphasis]

There is a discernible shift in this position in Marshall's later writing (i.e. after about 1890). He now wanted to enforce the distinction between fact and value (economic advice and policy) less rigidly. He seemed to wish to introduce the imperative mood, the ought, into economic advice. In a passage dating from the third edition of the Principles (1895)

⁸¹ This distinction is encapsulated in the title of his 1896 address at Cambridge, 'The Old Generation of Economists and the New', Memorials, pp.295-311.

⁸² A. and M.P. Marshall, op.cit., p.2. Original emphasis.

⁸³ Marshall, 'The Laws of Political Economy...', op.cit., p.123.

⁸⁴ Marshall, Bristol lecture, 'The Aims and Methods of Economic Study', labelled by Marshall 'Use of Studying Political Economy', as reported in Bristol Times, and the Bristol Mirror, (the reports are identical), October 10, 1877, Marshall Papers, 4 (formerly 9[5]), Cabinet File 2, Notebook, 'Method (including press cuttings of Bristol lectures)'. Marshall had begun this lecture by stating his preference for the term 'Economic Science' but here continued to also use the older 'political economy'. For further evidence of Marshall's view that the generalist skills of the politician were most useful in policy decisions, see also 'The Present Position of Economics' (1885), especially pp.164-5. Here Marshall had Economics bowing in 'social problems' before the 'supreme authority' of what he called 'common sense'. The economic perspective was only one factor in a political decision and Economics, 'Having done its work, it retires and leaves to common sense the responsibility of the ultimate decision...helping where it could help, and for the rest keeping silence'.

Marshall claimed that, while in general Economics was a science, and therefore was unable to make definite policy recommendations, some parts of it were so close to an Art that they could so do:

Now in such a matter as banking or taxation, in which the economic element predominates over all others, there may be but a short step from the laws of the applied science in the indicative mood to the precepts of practice, or Art, in the imperative mood. There may be but a short step from the applied science of banking in its more general sense, to broad rules or precepts of the general Art of banking: while the step from a particular local problem of the applied science of banking to the corresponding rule of practice or precept of Art may be shorter still.⁸⁵

In the very next paragraph, Marshall inserted the now familiar qualification that the economist should only express his opinion on a certain policy 'rather in his private capacity, than as claiming to speak with the authority of economic science'. However, he was now less dogmatic on this point: he equivocated, commenting that 'the matter is one on which opinions differ'.⁸⁶

In the Fifth Edition of the Principles, (1907) this shift is even more apparent. Marshall no longer argued for a clear distinction between economics and policy. The role of the economist had expanded to include hitherto forbidden territory. The economist was no longer to be merely an impartial adviser, but was to move closer to a constructive role in formulating policy goals and specific policy choices to attain them. Marshall stated that economics:

...aims indeed at helping him [the statesman] to determine not only what that end should be, but also what are the best methods of a broad policy devoted to that end.

At the same time, the role of the special skill of the politician in policy-making had been reduced to:

the discussion of those exigencies of party organization, and those diplomacies of home and foreign politics of which the statesman is bound to take account in deciding what measures that he can propose will bring him nearest to the end that he desires to secure for his country.⁸⁷

⁸⁵ See Marshall, Principles, 9th (Variorum) edition, 2 Vols., (Vol.1 Text, Vol. 2 Notes), edited by Guillebaud, (London, Macmillan for the Royal Economic Society, 1961), Vol. 2 Notes, p.154. Parts of this passage were deleted and parts rewritten for the fifth edition. See Guillebaud, Vol.1, p.37, footnote E, for this later version.

⁸⁶ Marshall, from Guillebaud, op.cit., Vol. 2, Notes, p. 154.

⁸⁷ Ibid., Vol. 1, p.43. This passage dates from the 5th Edition.

There may be an indication here that Marshall was becoming more flexible on the question of the economist's role in policy as his moves to professionalise economics were showing some success, and as Marginalist economics (and later Welfare economics) became more generally accepted as a framework for economic theorising.⁸⁸ He perhaps now felt more confident that the subject was now more positively (and more positivistically) publicly perceived. Perhaps now he could risk the re-introduction of a role in policy-making for economics. However, even this later more radical claim for involvement in policy-making was phrased very cautiously. The public and political reactions to the involvement of economists in the tariff reform controversy were to provide a telling demonstration of how necessary such caution was.

The fact that Marshall publicly claimed that economics and policy were still, in many senses, distinct activities did not mean that, more privately, he practised what his rhetoric was preaching. In fact he did give specific policy recommendations in the Principles itself, advocating, for instance, increased government expenditure in aid to the helpless. He wrote to the Times advocating public works to help the unemployed, and opposed old age pensions in the Economic Journal. He also submitted a memorandum on 'Ethical Aspects of Limitations of Poor Relief' to the Royal Commission on the Aged Poor.⁸⁹ Furthermore his private notebooks are packed with comments on topical issues, and even on proposed legislation. Moreover, he could not stop himself from going public with his views on policy when roused by contentious issues close to his heart like tariff reform.

5.4 PUBLIC DISTANCE, PRIVATE PROXIMITY: MARSHALL'S INVOLVEMENT IN POLICY- MAKING:

While the negative public science of economics emphasised the distance between economics and politics, and Marshall's public work was presented as the opinions of a private citizen rather than as the authoritative pronouncements of a scientific economist, privately he enjoyed a much closer relationship with policy-making. Marshall's activities

⁸⁸ See Maloney, Marshall, Orthodoxy..., op.cit., chapter 11.

⁸⁹ Marshall, Principles 8th edition, p.714-5; Times, 15 Feb. 1886; Marshall, 'The Poor Law in Relation to State-Aided Pensions', Economic Journal, March 1892; Marshall, Official Papers by Alfred Marshall, pp.202-3. All cited here from Maloney, Marshall, Orthodoxy..., op.cit., p.198.

during the Tariff Reform debate of 1903 illustrate this private dimension of involvement behind the public claims to distance.

Marshall's position on the fiscal question had been established in 1875, when he visited America expressly to study protection in action. He concluded that Free Trade was the best policy for America and Britain alike.⁹⁰ This belief remained unshaken in 1903:

It seems to me that the policy adopted in England sixty years ago remains the best, in spite of increasingly rapid economic change, because it is not a device, but the absence of any device. A device contrived to deal with any set of conditions must become obsolete when they change. The simplicity and naturalness of Free Trade - that is, the absence of any device - may continue to outweigh the series of different small gains which could be obtained by any manipulation of tariffs, however scientific and astute.⁹¹ [original emphasis]

However, Marshall was now convinced of the very real possibility of a return of some elements of Protection. His letters of the period to the German historical economist Brentano⁹² are marked by a tone of woeful resolution to the imminent collapse of Free Trade.⁹³ Marshall believed protection was most likely to return in the form of retaliatory measures against foreign duties on imported British goods, and against the dumping of cheaper foreign goods in Britain. He commented on 17 July 1903 that:

Retaliation -especially against indirect bounties, and against "dumping" down sugar and other things at less than cost price- seem to me more insidious, and more likely to lead to real Protection than "Imperial Federation".

He added on 29 September that, 'Sooner or later I fear that the dumping question will be the ruin of our free trade.'⁹⁴ The gravity of the threat Marshall perceived to Free Trade was intensified by Chamberlain's propaganda campaign which included: pamphlets ('by the million'⁹⁵); speeches and rallies; the support of sections of the popular press⁹⁶; and pro-

⁹⁰ See Alfred Marshall, 'Some Features of American Industry', Marshall Papers, Box 6 No.7, reproduced in Vol.II of J.K. Whitaker (ed.), The Early Economic Writings of Alfred Marshall 1867-90, (London, Macmillan for Royal Economic Society, 1975). See also 'Some Aspects of Competition', in Memorials, pp. 256-91, section II.

⁹¹ Marshall 'Memorandum on the Fiscal Policy of International Trade', p.394 (as reproduced on pp.365-420 in J.M. Keynes, ed. Official Papers by Alfred Marshall, (London, Macmillan, for the Royal Economic Society, 1926). This work is hereafter referred to as the Memorandum.

⁹² Lujo Brentano (1844-1931): leading German historical economist and professor of political economy at Munich from 1892.

⁹³ See H.W. McCready, 'Alfred Marshall and Tariff Reform, 1903: Some Unpublished Letters', originally in Journal of Political Economy, Vol.63, June 1955, pp.259-67. Cited here from Alfred Marshall: Critical Assessments, op.cit., No.100, pp.48-61.

⁹⁴ Ibid., p.52 and p.58. See also letter of 24 July 1903, pp.53-4.

⁹⁵ Letter Marshall to Brentano, 20 July 1903, Ibid., p.52. Letters hereafter referred to as AM-LB, with date.

tariff articles in the Times written by W.A.S. Hewins (under the pseudonym of 'An Economist'), with Chamberlain's hearty support and superintendence.⁹⁷ At first Marshall was loath to reply to these articles, though he keenly felt the need to do so, both on account of their impact and what he perceived as factual errors. He must also have felt the danger that the clever choice of pseudonym implied the acquiescence of the entire profession with the views expressed. But he would not be forced to rush into print: his model of the profession was, as we have seen, to stress its scientific content and to distance it from the taint of politics, and he did not want to jeopardise his hard work in building up this conception of the economist in the public mind by becoming involved in a very public debate. He was acutely conscious that the intensity of the fiscal debate, and its association with specific political positions meant that any article could not keep economics and politics separate. As he wrote to Brentano on 17 July:

..though writing as 'an economist', he is even more dogmatic and omniscient in his capacity of statesman than in that of economist. And his later letters, even while professedly talking sheer economics, assume premises which he considers himself to have established as a politician. So if one answers him, one must mix up politics and economics.

For that work the better class of newspapers and members of Parliament are better fitted than economists of the chair, who make it a duty to bring out arguments, which tell against their ultimate conclusion, as faithfully as those which tell for it.⁹⁸

Thus he turned down an offer to write replies to the articles in the Times, which had been the editors original wish, although he remonstrated with Hewins in private letters.⁹⁹ He also rejected the invitation of one of the monthly journals.¹⁰⁰ As far as public replies were concerned, he consoled himself with Chapman's articles for the Daily Mail, and those which Bastable was preparing.¹⁰¹

⁹⁶ Marshall mentions the Daily Mail, as particularly influential in swaying the masses. See AM-LB, 17 July 1903, Ibid., p.51-2.

⁹⁷ Sixteen articles appeared from June to September, 1903 under the title, 'The Fiscal Policy of the Empire'. Hewins received the invitation to write them from the paper (via L.S. Amery), after it had turned down his initial suggestion for articles solely on German tariffs. But the final form of the articles (with 'plenty of quotable phrases' and topical appeal) came directly from Chamberlain. See Hewin's autobiography, The Apologia of an Imperialist, Vol.I, (London, Constable, 1929), pp. 66-68.

⁹⁸ AM-LB, 17 July 1903, McCready, op.cit., p.51.

⁹⁹ Ibid., p.50.

¹⁰⁰ According to Hewins, op.cit., p. 67.

¹⁰¹ See AM-LB, 17 July 1903, McCready, op.cit., p.50. S.J. Chapman (1871-1951) was Professor of Political Economy at Owen's College, Manchester, 1901-17. His four articles appeared between 30 June and 11 July 1903. He also wrote Foreign Competition, on the tariff question. C. F. Bastable (1855-1945), was professor of Political Economy at Trinity College, Dublin, 1882-1932.

However, Marshall was not averse to commenting on topical political issues, but rather, merely averse to doing so in public. In this same letter, he hinted to Brentano that he was:

engaged at this moment in formulating my own opinions on some of the chief matters which are now before the country: and I must of course incidentally traverse many of his [Hewin's] statements and arguments.

At this date he was committed to publishing this paper 'in some form or other, before the crisis is reached.'¹⁰² His later change of mind on this reveals much about the lengths he would go to protect his model of the professional economist.

This document was in fact his famous 'Memorandum on the Fiscal Policy of International Trade'. In his next letter to Brentano (20 July 1903), he admitted the real nature of this work. In a postscript which he was careful, even in this private letter, to clearly mark 'Confidential', he wrote that:

I hate mystery. So I am going.....to tell you in strict confidence that what I have been, and still am, engaged on here is a Memorandum on the whole of the Chamberlain proposal, written privately for the use of a leading member of the English Cabinet at his request.¹⁰³ [original emphasis]

This Memorandum has been described as 'one of the finest policy documents ever written by an academic economist'.¹⁰⁴ Given this, it is clearly important in understanding Marshall's approach to policy-making and the relationship between the State (politicians and bureaucrats) and outside academic experts in this period. It is interesting to note, then, that it was neither commissioned nor produced through any of the more usual channels of communication, like Commissions or Committees. In fact it was requested unofficially and completed in almost total secrecy (apart from Marshall's disclosure to the foreigner Brentano). Furthermore, although Marshall wrote of publishing it in 1903, in fact he became very wary of so doing, and it was only with great reluctance that he finally allowed it to be published in 1908. Now, while there are obviously proximate causes for this course of action (for instance Balfour's Government may have felt that to grant a public enquiry

¹⁰² Both quotations taken from AM-LB, 17 July 1903, McCready, *op.cit.*, pp.50-1.

¹⁰³ AM-LB, 20 July 1903, from *Ibid.*, p.52.

¹⁰⁴ T.W. Hutchison, *On Revolutions and Progress in Economic Knowledge*, (1978), p.114. Cited here from J.C. Wood, 'Alfred Marshall and the Tariff Reform Campaign of 1903', originally from *Journal of Law and Economics*, Oct 1980, pp.481-95, here from p.312, *Critical Assessments*, *op.cit.*, No. 122, pp.312-326.

would be tantamount to surrendering to Chamberlain-ism), I want to argue that this episode is a good illustration of Marshall's attitude to policy-making as an economist, and is an example of one of the two main ways in which the British State preferred to gather expert advice from sympathetic experts.

On 2 July 1903, T. Llewellyn Davies, the private secretary to the Chancellor of the Exchequer, C.T. Ritchie, wrote to Marshall:

I am sure you must be very much concerned with what the newspapers call the "fiscal problem". I don't suppose you would be able to find time to take part in newspaper or magazine controversies and I would not venture to bother you on my own account. But in talking matters over the Chancellor of the Exchequer expressed a strong wish that he might have the advantage of any unofficial expression of your opinions, or any suggestions as to the right method of handling the questions, which you might be able to offer: and it is at his desire that I now write.¹⁰⁵

Marshall acceded to this request and began his Memorandum on 14 July. The correspondence between him and the Chancellor's office kept up through July and August, with Llewellyn Davies often commenting on the arguments of various parts of the Memorandum which Marshall had sent, asking new questions on Ritchie's behalf and drawing the economist's attention to related problems.¹⁰⁶

Marshall therefore had no need to engage in public debate, which was anyway anathema to him: he believed that he alone secretly had the ear of a section of the Government, at its own special request. No wonder we find him writing to Hewins on that very same day:

If I really thought there was any danger that the scheme which you advocate would be put into practice, I should feel bound to break through my rule against taking active part in the discussions in the market place.¹⁰⁷

The correspondence between Llewellyn Davies and Marshall also sheds light on our other theme: the relations between government and outside expertise. In a letter of 25 August Llewellyn Davies was at pains to stress that there were no plans to bring out the

¹⁰⁵ T.Llewellyn Davies to Marshall, 2 July 1903, Marshall Papers, Letters, M 1/252.

¹⁰⁶ See letters in the Marshall Papers to Llewellyn Davies of 14 July 1903, and from him to Marshall of 13 August and 25 August 1903, respectively: M 1/253, 254 and 255.

¹⁰⁷ Letter from Marshall to W.A.S. Hewins, July 14 1903, Hewins Papers, University of Sheffield. Cited here from p.487, footnote 1 of A.W. Coats, 'The Appointment of Pigou as Marshall's Successor: Comment', Journal of Law and Economics, Vol.15, (1972), pp.487-95.

Memorandum as a government publication, and that if Marshall should wish to have it published or should its existence otherwise come out, the official line was to be that there was no initial request from the Government for Marshall's opinions:

It is now clear that the Government does not mean to consult Economists generally in a systematic way - in fact I do not know that any others have been consulted....and under all the circumstances there would be no question (even if we had your permission) of issuing your Memorandum by itself officially, so I hope it will be satisfactory to you - as I gather from your letters it would be - that the position should stand thus: that the Chancellor of the Exchequer asked you for your views: that you communicated to him a Memorandum which was and remains altogether your property: that he printed it for his own convenience,....but that the question of publication remains entirely in your own hands except that he would prefer that, in case of publication, any reference to his intervention in the matter should be omitted. I needn't say that I hope you may manage to publish it soon.¹⁰⁸ [My emphasis]

This caution indicates that Government was keen to avoid the constitutional issues raised by the informal use of outside experts as policy advisers, and how keen not to be seen getting this advice solely from experts particularly sympathetic to its own fundamental ideological position.

Marshall himself agonised over whether or not to seek to have the Memorandum published. He seems to have finally decided not to in 1903, perhaps because of the public backlash against academic economists sparked off by the anti-protectionist Manifesto published in the Times of August 15 1903.¹⁰⁹ As we would expect, Marshall had initially been against this move, which was suggested by Edgeworth. But he began to feel that Chamberlain and his league had now 'committed themselves to the most glaring economic falsities', and needed to be answered. Marshall admitted that because of this 'I changed my mind' about a public rebuttal of Chamberlain and 'suggested that one should be drafted in England'.¹¹⁰ Marshall initially thought that 'on the whole we can be proud of it'.¹¹¹

¹⁰⁸ Letter from Llewellyn Davies to AM, 25/08/03, Marshall Papers, Letters, M1/255.

¹⁰⁹ A reply to many of the arguments of "An Economist", agreeing with the aim of closer relations with the Empire, but rejecting Chamberlain's scheme as a means of achieving this goal. It was signed by fourteen academic economists, largely drawn from the orthodox side of the profession. They included: Marshall, Pigou, Bastable, Bowley, Cannan, Edgeworth, with S.J. Chapman and J.H. Clapham adding their names afterwards.

¹¹⁰ Letter AM-LB, 18 August 1903, McCready, *op.cit.*, p.56. Another motivation for this uncharacteristic move may have been that Marshall sensed that the political tide was turning in favour of limited Protection. A letter of 29 September 1903 to Brentano shows that he had inside information of Balfour's shift, possibly from Llewellyn Davies or from Ritchie himself (See McCready, p.57-8). He may have realised that the Chancellor was becoming increasingly isolated from Balfour, and decided that his private influence was no longer enough to stop Chamberlain, now the Government was leaning this way. It was the time to go public. Ritchie did indeed resign in September, on the publication of Balfour's Notes, and Marshall wrote a private letter to him expressing his

However, the Manifesto was furiously attacked by the Times, which accused the professors of 'not really speaking in their scientific character at all, but...illegitimately employing their scientific position to further a political demonstration'. It concluded that 'in the public mind', 'these gentlemen have inflicted grave injury upon the estimation and repute of the science they profess'.¹¹² Within a week Marshall felt that the Manifesto was 'vulnerable' and he had noticed various 'blemishes in the drafting'. In reply to the charges in the Times that these were matters with a large political element on which economists should not comment, he still maintained that 'the points on which we do speak were such as economists have always been expected to speak decidedly about'. However, he must have felt that the Manifesto had misjudged the public reputation of economists, and had ended up damaging it further.¹¹³ From the other side, the Cambridge historical economist Foxwell, who had refused to sign the Manifesto and had written to the Times criticising it, agreed that the Manifesto had been particularly injurious to the public standing of the profession as a whole:

...the Manifesto has had the effect which so many of us foresaw at the time of putting economists out of court altogether. We are now hopelessly discredited: in fact political economy seems to have fallen back in public opinion to the position it held about the 70s. I hoped that the more realistic and liberal tone of the work of the last generation would have gained for English economists something of the respect which German economists enjoy in the world of affairs. However the mischief is done and silence is now the most fitting attitude for a "professor".¹¹⁴

The public nature of the Manifesto had drawn criticism from leading politicians as well as from the newspapers. Balfour commented that:

If a man of science once lets the public think that he is speaking not in the interests of his science, but in the interests of his party, if he once allows the view to get abroad that his expression of opinion may have its origin in his scientific views, but has a double parentage, and that the scientific views are in some sense moulded in conformity with our political differences, his whole authority from that moment will absolutely vanish: he will sink to the level of the unfortunate person who now addresses

'gratitude for the stand which you have made.' (See AM-Ritchie, 21 September 1903, Marshall Papers, Letters, M1/257).

¹¹¹ AM-LB, 18 August 1903, McCready, *op.cit.*, p.56.

¹¹² Times, leader of 20 August 1903, 'Professors and Professors'. Foxwell and Hewins also attacked the Manifesto in letters to the paper on this day. It is however, worth noting that the paper was avowedly pro-Chamberlain and that it probably exaggerates the degree to which economists were publicly discredited.

¹¹³ AM-LB, 26 August 1903, McCready, *op.cit.*, p.57.

¹¹⁴ Letter from H.S. Foxwell to James Bonar, 22 November 1903, Kress Library, Harvard University. Cited here from p.221, Coats, 'Political Economy and the Tariff Reform Campaign of 1903', Journal of Law and Economics, Vol.11, (April 1968), pp.181-229.

you. Let him at all costs avoid that danger. It is quite true that he will in those circumstance not feel that he is to any great extent influencing the current of contemporary thought; but he will be wrong. He is influencing it if he treats a scientific subject in a scientific spirit. He may not be quoted by this or that politician, he may not figure largely in election addresses, but he will do what the great economists in the past have done -he will slowly mould public opinion; and if he aims too quick at attaining that result he will only sacrifice what he can get for something which he cannot get, and which, if he could get, would not be worth having.¹¹⁵

Balfour had of course moved closer towards accommodating Protection with his Economic Notes on Insular Free Trade, a pamphlet published on 16 September 1903, and so his attack on economists may have been due to the political embarrassment that the Manifesto of the orthodox economists may have caused him. But I would suggest another reason. It was a warning that such economists had abused a trust by going public: they had not kept to the tacit bargain which Marshall's position embodied, of maintaining a public silence on political issues, in return for private influence. Public comment on politically sensitive questions which appeared to have the authority of economic science would cost economists their private political influence. Given this it is no wonder that Marshall speedily returned to his former position. A year later he spoke of his rejection of 'all manifestos by economists on political questions'.¹¹⁶ He now thought it best to 'just lie low, and bend our backs to the smiters'.¹¹⁷ Thus he may have decided not to publish his Memorandum at this politically sensitive time, for fear of further alienating himself from his privileged access to influence over government circles.

Marshall was still keenly aware of the damage done to both the public and private standing of economists even five years later. When he was asked in 1908 by S. Armitage Smith, the then Private Secretary to the Chancellor of the Exchequer (Lloyd George), for permission to publish the 1903 Memorandum as a government paper,¹¹⁸ he agreed only with the greatest reluctance.¹¹⁹ He replied to Armitage Smith, expressing his reservations but finally agreeing:

¹¹⁵ Speech of Balfour as Vice-President at Annual Dinner of Royal Economic Society, July 1904, p.353 'Meeting of the Royal Economic Society', Economic Journal, Vol. 14 (1904), pp. 351-5.

¹¹⁶ At the August 1904 meeting of the BAAS, Economic Journal, Vol.14 (1904), pp.483-4.

¹¹⁷ AM-LB 26 August 1903, McCready, op.cit., p.57.

¹¹⁸ See Armitage Smith to Marshall, 20 June 1908, Marshall Papers, Letters, M 1/258.

¹¹⁹ It had become necessary to have the Memorandum published when Bonar Law had challenged Asquith to produce publicly the evidence when his ^{Chancellor} Lloyd George, had quoted from Marshall's unpublished work. This story comes from a letter from Marshall to J.A. Murray MacDonald, the Secretary of the Cobden Club, 23 April 1910, Marshall Papers, Letters, M 1/266. See also Parliamentary Debates Vol. CLXXXIX, p.1670; p. 1747.

But I think I am bound to accede to the Chancellor's request, although in so doing, I am departing from the line of procedure which I had marked out for myself, and am indeed acting somewhat inconsistently.

I have always acted on the principle that a professional economist should, as a rule abstain from controversy of all kinds.....he should avoid rather than seek those particular issues of the day as to which it is not easy even for a private citizen to present a wholly unbiased judgement. For this reason, instead of publishing my memorandum, as I was invited to do in the Autumn of 1903, I am writing a large volume on National Industries and International Trade, in which I am endeavouring to treat solidly those large questions, on which the Memorandum expressed my opinions with a brevity, that necessitated a certain amount of dogmatism...¹²⁰

Furthermore, Marshall only agreed to publication on the condition that the above letter, 'should form a Preface to the paper, and that it should be published as such'.¹²¹ In the final version of this Preface, Marshall tellingly described the Memorandum as a dogmatic expression of 'private opinion' rather than a professional document.¹²² In the light of the mistake of going public with the Manifesto he no doubt decided that the wisest course was to keep this private document private as long as he could. He had returned to his earlier position of maintaining a public separation of politics and economics, for the sake of maintaining his private influence.

As a version of the Preface written on 23 September 1903 shows, Marshall, had been moved to act rashly in signing the Manifesto: he 'desires to influence the public' and 'is after all a human being' and was incensed by what he saw as the economic falsehoods with which Chamberlain was stumping the country.¹²³ But he realised what damage he had done to the public standing of economics, and to the privileged private relationship he enjoyed with the Government, and he did not compound his error by publishing the Memorandum in 1903.

5.5 PIGOU'S CONTRIBUTION

¹²⁰ Marshall to Armitage Smith, 27 June 1908, Marshall Papers, Letters, 1/260. A copy in Mary Paley Marshall's hand, the later pages of which appear to be missing.

¹²¹ Armitage Smith to Marshall, 4 July 1908. Armitage Smith is repeating Marshall's 'desire' that this should be the case, from Marshall's letter of 27/06. This part of Marshall's letter has not survived, as we noted above. Marshall Papers, Letters, M1/261.

¹²² Marshall, Preface to Memorandum, in Keynes, *op.cit.*, p.368.

¹²³ Marshall, 'Preface', 23 September, 1903, Marshall Papers.

During the tariff debate, it was still dangerous for an economist of the Marshallian School to pronounce openly on policy. A further element had to be added to Marshall's synthesis to ensure economists spoke with a unified and thus authoritative voice in policy questions. This process seems to have reached its conclusion under the direction of A.C. Pigou, who, on Marshall's strong recommendation, succeeded him in the Cambridge Professorship in 1908.¹²⁴ His Wealth and Welfare of 1912, by identifying economic welfare with total welfare, provided the theoretical justification for economists' involvement in policy advice, at just the point when the profession had developed enough to be able to make use of such an opportunity. While Marshall was developing the economics profession by boosting its public image as the producer of scientific, apolitical knowledge, the vexed question of the social/political role of economics had been tactfully avoided in public. In fact the needs of professionalisation and social/political role had seemed to be pulling 'economics in opposite directions'.¹²⁵ Now that economics was in a more healthy position with more university posts, greater internal cohesion, and degree courses established to provide for future generations of economists, and ensure their adherence to a deductive economics, this tension was resolved by welfare economics, the purpose of which was 'to provide a theory of economic policy'.¹²⁶ The great strength of Pigou's innovation was that it was not a single theory, but what John Maloney has described as a 'research programme'.¹²⁷ Theory contributed enough to policy give it more authority than mere opinion, but theory did not dictate policy. It was possible to use the same theory to support different policy conclusions, and thus Pigou's chance 'of creating a solid and lasting professional grouping'¹²⁸ were much improved. Pigou's body of theory gave 'its exponents a way of making policy recommendations which differentiat[ed] them from outsiders even when they..[were] disagreeing with each other on specific policies'.¹²⁹ This unity of theory and practice had been hoped for by Marshall¹³⁰ but it was Pigou who achieved it.

¹²⁴ For a discussion of the issues surrounding the succession of Pigou see, R.H. Coase, 'The Appointment of Pigou as Marshall's Successor', Journal of Law and Economics, Vol. 15, (1972), pp. 473-85; and A.W. Coats, 'The Appointment of Pigou as Marshall's Successor: Comment', Journal of Law and Economics, Vol. 15, (1972), pp.487-95. For a useful potted biography see John Saltmarsh and Patrick Wilkinson, Arthur Cecil Pigou, 1877-1959, A Memoir, (Cambridge, CUP for King's College, 1960).

¹²⁵ Maloney, Marshall, Orthodoxy..., op.cit., p.181.

¹²⁶ Ibid.

¹²⁷ See Ibid., pp. 181-5.

¹²⁸ Ibid., p.182.

¹²⁹ Ibid., p.183.

¹³⁰ See Koot, op.cit., p.132.

5.6 CONCLUSION

What are we to make then of Marshall's imperialistic attempt at the unification of economics, the addition of such professional attributes as the BEA and the Economic Journal, his scientisation of the subject, and its accompanying negative public science which held that economics and politics were different kinds of activity? My argument is that these activities were intimately bound up with each other, and that, from this perspective, a new picture of the relations of economics and politics in this period emerges. Marshall created a new unified professional economics with Cambridge as its centre. Publicly political influence was sacrificed for professionalisation based on scientific rigour. As the position of the new economics became more secure, with the waning of the challenge from historical economics, the BEA, Journal, Tripos and safe succession to Pigou, and the completion of welfare economics, the theoretical component of Marshall's strategy, he began to be more bold about the claims he made for economics as a guide to policy. Meanwhile, contrary to the public rhetoric, Marshall was closely connected with policy formation, through informal, *ad hoc* channels, activities which did not disturb the neutral, scientific public image of economics.

In effect then, Marshall was adhering, at least in the short term, to the gospel of political activity for economists according to Balfour. And this is of great importance. Marshall was much more politically aware than the scientists. He had a shrewd understanding of British State culture. He knew that politicians and Civil Servants did not like to be seen surrendering official control of policy-making to outside experts to any degree. At the same time he understood that this did not mean that such experts could not exercise influence, but rather that it could be had only on the State's terms. This meant relations with experts which were *ad hoc* in the case of the various forms of public enquiries, and informal in the case of advice through secret and wholly unofficial channels, and the wider more long term moulding of the opinions of the politically important members of the polity. If we add to this, in the case of informal/*ad hoc* influence on policy, the fact that Cambridge economists of this generation were largely in tune with the State culture ideologically - they that is to say they were economic liberals (Free Traders) and institutional conservatives (envisaging only a limited role for the State in society) - then it

becomes clearer that the State was more likely to turn to Cambridge economists for informal advice.

In 1907, Marshall commented approvingly on the government of India, Egypt and other countries influenced by Britain, that

British unconventional, elastic methods of administration give scope for free, fine enterprise in the service of the State; and it atones for many shortcomings in forethought and organisation.

He continued, now talking of Britain that

Again, because the dead hand of bureaucracy has stretched but a little way into her affairs, this country is able to call together voluntary committees of men trained in strenuous private enterprise, who freely give good general guidance in some large matters, such as London transport systems and army administration.¹³¹

However, once the position of economics as the authoritative, scientific social science was assured, Marshall looked forward to, and even began to suggest, a more formalised role for economists in policy-making.

So no overt political rhetoric for immediate influence from the dominant school of economists. But what of those economists marginalised by Marshallian hegemony. Did they produce a more positive and radical political rhetoric for influence in the short (as well as long) term? The obvious place to look is the historical economists, who were committed to a more practical economics. However, they were too heterogeneous to constitute a group, and were further fragmented by Marshall's subsume and conquer campaign. They produced no alternative school or body of theory, and thus, unsurprisingly, there seems to have been no characteristic positive public science from them. However, the desire for immediate, open, formal influence over policy-making was very strong, though it expressed itself in a variety of strategies, for instance, W.A.S. Hewins became (albeit briefly) a government minister as Under-Secretary of State for the Colonies.¹³² In the next chapter, I want to examine the public science of one historical economist, William James Ashley, who put forward a strong alternative conception of the professional economist as the economist in action, during the controversy over tariff reform and particularly with his extensive (and

¹³¹ Marshall, 'Social Possibilities of Economic Chivalry (1907)', in *Memorials*, p.343.

¹³² He served from 1917-19. Hewins was a Conservative M.P. from 1912-18.

high profile) government war work. Like the scientists that were studied in earlier chapters, Ashley propounded a positive public science: for him the economist defined himself not as an apolitical scientist, even one with private influence, but openly and straightforwardly as a guide to policy. The economist should not 'grovel before the state'¹³³ for recognition but should be formally incorporated into the machinery of government as a valued resource for policy advice.

¹³³ Ashley, 'Citizenship', in The Christian Outlook Being the Sermons of an Economist, pp.13-26. (London, Longmans Green, 1925).

THE PRACTICAL ECONOMIST AT WORK: WILLIAM JAMES ASHLEY

It is a curious academic point that economic historians were more flexible than economists. In the early twentieth century they provided the first Protectionists (Ashley, Cunningham, Hewins); between the wars they were usually social reformers or socialists (Tawney, the Hammonds, Cole).¹

The period from the publication of the Principles to the First World War saw the domination of the Marshallian School with its emphasis on theory and the pre-eminence of the deductive approach in economic science. Hand-in-hand with this went the public presentation of economics as an objective science, the very nature of which discounted any involvement in controversial matters of policy (while privately, influential channels to policy were kept open).

This kind of public science forms an interesting parallel with scientists, as was noted. Scientists publicly argued that the scientific method was the reason why they should be involved in policy, whereas Marshallian economists publicly argued that it was the very reason why they could not. But the scientists were able to work with a wider definition of the scientific method in which deduction and induction were blended together. They were able to do this because the professionalisation of the natural sciences was more advanced than that of economics. The arcane mysteries of the exact proportions of induction and deduction in the method of the natural sciences was not a matter for serious public concern (although it might still rear its head in occasional technical controversies within the scientific community). Publicly the idea that there was a methodological consensus within the natural sciences was generally accepted, and had been since the public campaigns of the Scientific Naturalists from the 1860s. These had used Darwinian evolutionary theory as the example of how scientific method was uniform in its working from facts up to general theories (ironically as it happened since Darwin himself was far more deductive than this). Science had used method as a bridge to policy because the subject matter of science was not always directly that of policy;

¹ A.J.P. Taylor in a footnote aside while discussing the passing of tariffs by the National Government in 1931-2. See p. 331, footnote 1. English History, 1914-1945, (London, Book Club Associates, 1977, originally OUP, 1965).

economics, whose subject matter was largely the same as that of policy, had no need of a methodological bridge, but had to have a methodological consensus. If there was any visible schism over method, then economics' claim to authority was undermined.

Marshall wished to follow the professional trajectory of science, and make economics into a discipline with cultural and social authority, but he had first to construct a methodological consensus within economics. He tried to build this around economics largely conceived as a deductive discipline. This was partly his preferred slant, and partly since the subject area of economics largely overlapped with that of policy. Thus a generally agreed theoretical framework to approach that subject area, and from which to construct universally applicable economic laws as a guide to policy was one way in which economics could aspire to authority. Marshall thus looked to build a general theory of economic policy on which the long term claim of economists to guide policy could be based.

However, this was not the only version of economics as a science, or of the social role of the economist. The other side of the methodological debate in economics was occupied by the inductive historical economists. Historical economists propounded a view of economics as an inductive science working from detailed observation of both past and present economic conditions and behaviour to historically relative generalisations. Hand-in hand with this definition of economics as a science went the idea of the practical economist, with his wide knowledge of contemporary (and past) economic conditions as the natural guide to policy. Here the claim to guide policy was based not on the slow elaboration of universal laws or theories, but on practical experience of economic behaviour and conditions. But just as Marshall laid too much stress on deduction, so the historicists laid too much stress on induction and relativism. Although they can as a group be described, as David Reisman has done², as embodying the values of historical relativism; moral commitment; social reform; state intervention; and economic nationalism, they were an extremely heterogeneous group and, consequently, did not arrive at any inductively derived body of theory, although this remained a stated ultimate goal. Their ultimate eclipse by Marshallianism, and their relegation

² See David Reisman, Alfred Marshall's Mission, (London, Macmillan, 1990), pp. 211-34 passim.

to the field of economic history (separated from economics and stripped of all the other elements of their approach- which had gone to other emerging disciplines such as philosophy and sociology- they were left only with their historicism) was largely due to the fact that, unlike Cambridge economics, they had 'no text, no leader, and no centre....[and] also...because they tried to do so much'.³

In this chapter I will concentrate on one of the most public of the historicists, William James Ashley. Ashley was educated at St. Olaves School in Southwark and at Balliol where he read history. After several years at Oxford as a private tutor he was invited to take up the Chair of Political Economy and Constitutional History at Toronto in 1888. In 1892 Ashley was invited to occupy the first chair in economic history in the world at Harvard. In 1901 he returned to England to become Professor of Commerce at the new University of Birmingham. This was the first school of commerce at a British university.⁴ Much work has already been published on Ashley, but while this has explored his relations with Marshall and Marshallianism, the details of the Commerce Faculty at Birmingham, and Ashley's own ideological and political position, no attention has been given to Ashley's attitude to policy-making, or how his position here differed from Marshall.⁵ I will attempt to uncover the methodological and ideological underpinning of Ashley's conception of the science of economics and the role of the professional economist. I will then focus on these conceptions in action: in the Tariff Reform debate of 1903; in the activities of the Unionist Social Reform Committee of 1911-14; and in Ashley's extensive war work (for which he was knighted in 1917).

In his 1927 obituary of Ashley in the newly founded Economic History Review, W. R. Scott explained Ashley's lack of publications in economic history by suggesting that he was not content with the isolated academic path and favoured a different role for the economist:

³ Ibid., p. 230.

⁴ For details of Ashley's life see Anne Ashley, William James Ashley: a Life, (London, P.S. King, 1932).

⁵ The main texts here are: Kadish, Historians, Economists and Economic History, op.cit., especially pp. 228-42; Koot, op.cit., especially chapter 5; Bernard Semmel, Imperialism and Social Reform: English Social-Imperial thought, 1895-1914, (London, George Allen and Unwin, 1960), especially chapter XI.

..one feels that Ashley could not express himself adequately...by the contemplative life. In him there was a marked call to action. It was not enough for him to describe organisation, he wanted himself to organise.

Scott went on to note that Ashley found most opportunity to satisfy this desire for active and meaningful influence in his government work during the First World War:

One of the strange discoveries then made was that the country had a use for the economist; even, still more strangely, for the academic economist...In these circumstances Ashley spent himself most unsparingly. He felt that he had something to give, and he gave freely. Thus his later work is not to be found in books, but in the part he played in endeavouring to provide reliable data for the plain man to form a reasonable opinion upon the many questions which are perplexing him.

Scott thought this the 'completion' of Ashley's 'temperament'. I would want to argue that it was also the completion of Ashley's conception of the professional economist. Ashley was able to 'make his experience something concrete and living, which at the same time is of service to this generation and will also be of service to the next'.⁶ For Ashley it was the economist's duty not only to comment on contemporary questions, but to become involved in the workings of the expanded State to influence policy for the welfare of the State and all its citizens. As J. H. Clapham said of him, he believed 'that it was the economist's business to give what he had towards satisfying each emergent public need and guiding an ill-informed public opinion'.⁷ It was during the First World War that Ashley was most successful at getting into influential positions, although he was also active in the Edwardian period.

6.1 THE CALL TO ACTION: IDEOLOGICAL AND METHODOLOGICAL MOTIVATIONS INFORMING ASHLEY'S VIEW OF THE ECONOMIST'S ROLE.

According to his daughter, Ashley's 'attitude on social matters was of course, part of his religion'.⁸ He was 'Brought up,...moulded and developed' in a 'powerful spiritual and cultural environment' of evangelical Christianity.⁹ Ashley's commitment to organised religion waxed and waned throughout his life, finally re-establishing itself firmly in his later years, as I will

⁶ W. R. Scott, p 321, 'Memoir Sir William James Ashley', pp. 319-21, Economic History Review, Vol.I (1927).

⁷ J.H. Clapham, p. 682, 'Obituary: Sir William Ashley', Economic Journal, Vol. 37, (1927), pp.678-83.

⁸ Anne Ashley, op.cit., p.157.

⁹ Ibid., p.9.

note below.¹⁰ However, his belief in the purposeful progress of society, as demonstrated by history, was always strong. This derived from a combination of his underlying belief in the goodness of God, which was expressed in the world as progress, and his belief in slow Darwinian evolution. His daughter noted that 'his agnosticism was...never so thorough-going as to allow him to doubt the duty of personal morality and altruism'.¹¹

From 1913, Ashley began to preach sermons in various British churches, whose location was no doubt contiguous with the meetings of the Modern Churchmen's Conferences which he had regularly attended since he joined the Churchmen's Union in 1901.¹² Some of these were published in 1925 as The Christian Outlook Being the Sermons of an Economist. The connection between religion and social action was made abundantly clear throughout:

The duty of the Christian is not to grovel before the state, but rather actively to interest himself in it, and do what he can to make use of its machinery for the furtherance of social well-being. In this sense a good Christian should always be a good citizen.¹³

In another sermon entitled 'A Good Time Coming', and delivered in Dudley on 26th April 1925, but not included in this collection, Ashley began with the text from Revelation XXI:10 where the Holy City of Jerusalem descends out of Heaven from God.¹⁴ He argued that there was not enough 'public spirit guided by intelligence' in British Society to guide competition onto a 'higher plane' or even replace it with something better. On the surface this seems like a very general call for more active citizenship, but Ashley was quite specific about the direction in which efforts should be concentrated:

It is that public spirit we must create, if we are to have new institutions that are really going to produce better results in human happiness than capitalism. And it is to be created not by talking about it, but by example; by doing our best, unselfishly and intelligently, to get all we can for the community out of the social machinery already available.¹⁵

¹⁰ See Ibid., pp.37-9 and Chapter XVI.

¹¹ Ibid., p.38

¹² Ibid., p.157. Ashley later became a member of the Council and Vice-President of this organisation, and was also a churchwarden of Birmingham Cathedral in this period.

¹³ Ashley, 'Citizenship', pp.13-26, in The Christian Outlook Being the Sermons of an Economist. (London, Longmans, Green, 1925).

¹⁴ See Guardian, 1 May 1925, 'The New Jerusalem'. This was the title given the sermon by the editor; Ashley's original title is used here. See Ashley Papers, University of Birmingham Library (hereafter referred to as APB), 9/iv/4-5.

¹⁵ Ibid.

Ashley felt, then, that it was part of his Christian duty to participate actively in contemporary social and political issues, and to work for more effective institutions from within the existing machinery of government.

This sense of duty fitted well, and doubtless partly informed, Ashley's social-imperialist political stance. His position was best summarised in a letter he wrote to the German historical economist Lujo Brentano in 1913. Here he made clear the inter-connection of his views on the nation and the Empire, and Tariff Reform and social reform. He argued that the English protectionist movement was not simply the product of selfish manufacturing interests but was, especially when it stressed Imperial preference:

..the outcome of a new Idealism, the Idealism of a noble conception of the British Empire and the services it can render to Humanity. And among the young men of 25-45 who are keen Imperialists there are many who are equally keen Social Reformers. ...I was brought up a strong Liberal and many of my most intimate friends are strong Liberals: but since I began to care for Social Reform under Toynbee's influence (1882) I have been indifferent towards the claims of the Liberal party just because the party has never, in any deep sense, been fundamentally the party of social reform.¹⁶

Even after coming to Birmingham to take up the new Chair of Commerce in 1901, Ashley considered himself to be a Liberal. He looked to the Liberal Party 'to exert the pressure to bring about advance' in those areas of 'social and educational reform' in which he was most interested.¹⁷ However, he found himself becomingly estranged from Liberal circles over the question of tariffs, and was disenchanted with the level of its commitment to social reform issues. He thus moved towards the Unionists and became a Party member in 1906.¹⁸ His Unionism was of the social-imperialist brand. In 1916, he wrote to Oliver Lodge, his friend and Principal of Birmingham University, that the only imperialism he cared for was 'a Democratic Imperialism with a genuine Social-Amelioration intent and Content.'¹⁹ He believed in an interventionist state which would 'control' rather than replace individual action.²⁰ Furthermore, Ashley offered a new standard by which to test policy: the 'economic

¹⁶ Ashley to Brentano, 25 March 1913, quoted from H.W. McCready, p. 43, 'Sir William Ashley: Some Unpublished Letters', *Journal of Economic History*, Vol.15, (1955), pp. 34-43.

¹⁷ Ashley quoted in Anne Ashley, *op.cit.*, p.126.

¹⁸ See G.M. Koot, *English Historical Economists*, (Cambridge, CUP, 1987), p.119.

¹⁹ Ashley to Lodge, 24 May 1916, quoted in p. 109, 'Municipal and National Politics' (the second part of the chapter contributed to Anne Ashley, *op.cit.* by Ashley's Birmingham colleague, Professor J.H. Muirhead).

²⁰ Ashley, article in *The Outlook*, 20 October 1906, quoted in *Ibid.*, p. 111.

standard, the amount of wealth produced' was immoral, the moral standard was difficult to apply and was believed by those with legislative and administrative authority to have nothing to do with the state, so Ashley proposed that justice should be applied to something beyond the individual, and that , 'the final test ...must be the welfare of the state'.²¹

He was strongly nationalistic, and also believed that Britain's economic future was best assured by closer Imperial ties. This was the reason why he was so willing to ally himself closely with the tariff reform campaign: like Chamberlain he stressed the imperial reciprocity side of the case. As his daughter noted: 'He believed that only in the overseas Dominions could Britain find the large and dependable market she needed'.²² His nationalism and its Imperial context is perhaps best illustrated in a letter he wrote to the Vice-Chancellor of Birmingham University (C.G. Beals) on Empire Day in 1909:

I was very sorry to find on coming down to College this morning, that the flag was not flying from the University Buildings...I cannot but reflect how on this day (the late Queen's Birthday) the Union Jack is flying from every Public Building or School House from end to end of the Dominion....it seems to me unfortunate that Colonial students and Colonial visitors should be pained by the absence of the flag from the University Buildings on this of all days in the year.²³

So high did Ashley's feelings run on this issue that he purposed to put a motion before the University Council that the flag should be flown over buildings on both sites on future Empire Days.

The other influence which informed Ashley's view of economics, and the role of the economist was his early intellectual attachment to the socially oriented historical approach in economics. This he first encountered at Oxford from Toynbee, and it was under this influence that Ashley first became interested in social questions.²⁴ This approach dovetailed with the ideological views outlined above, and no doubt Ashley's receptivity to historicism was itself informed by these views.

²¹ Ashley, 'What is Political Science?', p. 19-21, inaugural lecture at the University of Toronto, 9 November 1888, (Toronto, Rowsell and Hutchison, 1888), APB, 9/iv/1.

²² Anne Ashley, *op.cit.*, p.122.

²³ Ashley to Beals, 24 May 1909, APB, 3/vii/4-5, Dean of the Faculty of Commerce Letterbooks. 4 (Letterbook 2), p.328-9.

²⁴ Arnold Toynbee (1852-83), a disciple of T.H. Green. Led to economic history by his philanthropy. A tutor at Balliol, his lectures on the Industrial Revolution were given in 1881-2.

Ashley was drawn to economics from a study of history. At Oxford he gained a first in History in 1881, and began privately teaching while looking for a Fellowship. During 1881-2 he taught constitutional history and stimulated by this he visited Toynbee (whose lectures on the industrial revolution he had recently attended after graduating) , asking to attend his political economy lectures to Indian Civil Service students. Instead he was advised to write fortnightly essays on classical economic doctrine, which would then be discussed with Toynbee. Eight years later he bore witness to the strength of Toynbee's influence in making him a historical economist saying : 'I regard [Toynbee] more than any other man as the source of whatever inspiration has come to me in the investigation and teaching of the subject'.²⁵ His daughter confirmed this in her biography:

He seems to have felt afterwards that in these talks with Toynbee he first came to see that economic doctrine could be studied historically and first encountered the dynamic as contrasted with the static view of economic theory and fact.²⁶

As Clapham noted in his obituary of Ashley: 'Learning was the foundation...but as Toynbee's disciple, he must always have seen it related to life'.²⁷

In common with other historicists, Ashley held that 'economic conclusions [were] relative to given conditions, and that they possess only hypothetical validity'.²⁸ Awareness of the historical relativism of economic doctrine would naturally have led to an interest in contemporary problems, even had it not been for the added impetus of the ideological influences described above. Such an approach led to a perception that orthodox economic doctrine could not be relevant to the current situation, as it had been formed in response to historically specific economic and social conditions. Ashley believed that orthodox economic doctrine was based on a narrow 'static' definition of economic behaviour. He posited that:

The problem [of demand] is, in a wide sense of the term , an historical one; or, if you prefer the phrase, a sociological one, both "static" and "dynamic". Behind the workman's wife making up her mind on Saturday night whether to buy another loaf or a scrap more meat stand the whole of human nature and the whole of social history.²⁹

²⁵ Ashley to Brentano, 16 October 1890, quoted from McCready, *op.cit.*, pp. 35-6.

²⁶ Anne Ashley, *op.cit.*, p. 22.

²⁷ Clapham, *op.cit.*, p. 678.

²⁸ Ashley, 'On the Study of Economic History', p. 3, original emphasis. Inaugural address at Harvard University, 4 January 1893, reprinted as pp. 1-21 in his *Surveys Historic and Economic*, (London, Longmans, Green, 1900).

²⁹ Ashley, 'The Present Position of Political Economy'. Presidential Address to Section F of the BAAS, Leicester, 1907, reprinted on pp. 223-246. in R. L. Smyth (ed.), *Essays in Economic Method*

Like other historicists, Ashley's long term plan for the nature and scope of economic enquiry was to establish economic doctrine on a new basis as an evolutionary study of society founded on generalisations from observable facts, rather than from abstract theory. Ashley's views on evolutionary social progress, noted above, predisposed him to see the task of economics as the search for 'conclusions as to the character and sequence of the stages in economic development'.³⁰ But for the moment the economist should not look to frame a new orthodoxy of laws, but restrict himself to offer practical advice for the solution of contemporary problems based not on theories but on observation of the present economic facts:

The prevailing method hitherto in England has been to pursue certain abstract lines of argument as to cause and effect, and then occasionally to look out into the noise and turmoil of real life and find there bits of concrete illustration. The method I urge...is the exact opposite: it is that of simple observation of actual life, with recourse, whenever it seems useful, to abstract explanation.³¹

This was Ashley forthrightly spelling out his methodological differences with Marshall. Elsewhere he was less dismissive of the deductive method, but equally clear that the inductive/empirical historical approach would bear more fruit. He stated his belief in 1904 that the deductions of orthodox economics were not used as interpretative tools with which to examine empirical economic data (historical and statistical), but instead used to draw conclusions 'which are dictated not by logic but by preconceived bias.' He thus thought the 'older economics' to be 'an inadequate' though not a 'fundamentally mistaken' method.³² He warned against relying too heavily on theory:

We think that economic problems need to be treated far more historically than they have hitherto been in England in order to disentangle...the tendencies of movements over wide

Selected Papers read to Section F of the BAAS 1860-1913, (London, Gerald Duckworth, 1962), p.233. The first emphasis is mine, the second is original. For another example of Ashley's consistent relativism see his 'Modern history' in A.M. Stedman (ed.), Oxford: Its Life and Schools, (London, G. Bell and Sons, 1887), p.303, where he states that: 'the so-called "principles" of Political Economy are at any rate not universally true for all times and places, and, in consequence, contribute scarcely at all to the understanding of the economic life of the past. For this it is necessary to study economic institutions in the light of the ideas of the time and to examine those ideas, not in relation to modern conditions which did not then exist, but in relation to the conditions amid which they arose'. Cited from p. 73, Kadish, 'Oxford Economics in the later nineteenth century', pp. 42-77 in Kadish and Tribe, op.cit.

³⁰ Ashley, 'On the Study of Economic History', op.cit., p.7.

³¹ Ashley, 'A Science of Commerce and Some Prolegomena', Science Progress, No.1 (July 1906), p.7.

³² Ashley, pp. 244-5, 'Political economy and the tariff problem', in Compatriots' Club Lectures. First Series, (London, 1905). Cited here from Kadish, Historians, Economists..., op.cit., p. 234. The article was originally published in the Economic Review, Vol. XIV, July 1904 (see Semmel, op.cit., p. 207).

spaces of time. The old abstract - so-called "deductive" - reasoning we regard as one of the means, and an important means, of interpreting the tendencies so disclosed. We accept all the main analysis of which it is so proud; though as they are seldom more than generalizations of common sense, we do not use quite such grand language about them. But we distinguish between these simple generalizations and the conclusions hastily drawn from them.³³ (Original emphasis).

Ashley believed that the future of economics as an academic discipline, and as a science with recognised authority in policy matters, would only be assured if it was shown to be concerned with practical realities, and could thus be studied vocationally. He thus dubbed the historical approach the 'realistic' method arguing that this was:

...simply the application to the past...of the same method of careful observation and ascertainment of facts, and of their appropriate grouping for purpose of presentation, as are necessarily employed in the realistic study of the present...³⁴

As would be expected, Ashley carried over this method from general economic study into the work of the Commerce Faculty at Birmingham. The way in which he talked about the role of the faculty's teachers provides a very clear illustration of his views of how the inductive/empirical method was to work in practice, and also of how an economist might work as a guide to policy. Rather than an emphasis on theory, the emphasis was on observation and comparison of business conditions. The faculty's teachers were to allow principles to emerge from a wide familiarity with the facts of business life. The teacher,

...will not set himself up as a superior person to teach the men of business; he will collect and compare the experiences of the men and affairs and bring out their common features; until at last he arrives at a series of principles, or generalizations...with the illustrative incidents grouped under several heads. Then perhaps it may be possible to show how commercial phenomena result from certain simple forces of human nature, working under such and such local or social conditions. But he will not begin with any postulates; he will rather...end with them.³⁵ (original emphasis).

As Ashley put it elsewhere, the function of the teacher (and, by implication of the economist as policy guide) 'will simply be to interpret to the business world that world's own experience.' The teacher's 'sole advantage will result from his wider acquaintance with the field of inquiry than most men actually engaged in trade have time to acquire'.³⁶

³³ Ibid., p. 260.

³⁴ Ashley, p. 189, 'The Enlargement of Economics', Economic Journal, Vol. 18 (1908), pp.181-204.

³⁵ Ashley, 'Our Education: what it is and what it ought to be. III Commercial Education'. in The World's Work, February 1903, p. 269. Cited here from Kadish, op.cit., p. 236.

³⁶ Quotations from Ashley, 'The Enlargement of Economics', op.cit., p. 202. For more of Ashley's thoughts on the role of the economist as teacher see his The Faculty of Commerce in the University of Birmingham: Its Purpose and Plan, (Birmingham University Press, 1903), especially p. 2, where he

Both ideological factors and his intellectual attachment to the historical approach to economics, with its orientation towards facts and its 'curious bearing on modern discussions', which gave it for him 'a keener zest',³⁷ propelled Ashley towards a practical economics. But Ashley also went a step further and posited that the most effective practical role for the economist was at the heart of policy-making.

6.2 ASHLEY'S PUBLIC SCIENCE

Ashley commented in his Toronto Inaugural in 1888 that the role of the economist was to offer advice on contemporary economic questions:

Having got to certain conclusions on a particular economic question, it seems to me, it is then the duty of the economist to point out the evils or dangers...that may be present, and to suggest means for their removal. Some English economists indeed declare that their subject is a science, not an art - that they must strictly limit themselves to the explanation of what is and give no hint as to what should be. But there has never yet been an economist who has not sometimes given advice in spite of himself: certainly the great public looks to the economist for practical guidance; and it is better to accept the situation. Surely he who has given more careful consideration than others to the economic side of social life, ought to be more capable of giving sound advice about it.³⁸ [original emphasis]

Ashley's rhetoric urging the duty and necessity of giving economic advice played on many of the same themes which were discerned in earlier chapters in the contemporary public science of the scientists. He clearly intended that such advice should not only be given in the wider forum of public debate (for example speeches and articles, and books on current controversial issues) but also directly to influential politicians, both informally and formally. He desired to work, as was noted in chapter four, through the existing formal mechanisms of committees and commissions, but also to use such opportunities to urge the need for new mechanisms of advice. He argued that advice and new mechanisms were necessary to offset the tendencies to corruption inherent in democratic government. Objective advice would ensure that British economic power was saved from the potentially damaging competing claims of parties and sectional interest groups, and was guided down the righteous middle path of, what Ashley perceived as, old-style Tory democracy, or to give it its newer name, Social Imperialism.

describes the teacher's job as to impart to the businessman, 'a body of principles of policy derived from current practice'.

³⁷ Ashley, 'The War and its Economic Aspects', a lecture to the Workers' Educational Association at Birmingham University, 18 November, 1914. Published in the series of Oxford Pamphlets. (London, OUP, 1914), p. 20.

³⁸ Ashley, 'What is Political Science?', op.cit., p.19-20.

Ashley stressed to his Canadian audience in 1888, that the masses were 'ignorant' and without aid 'will inevitably fall prey to the arts of unscrupulous part politicians', and that:

With a Democratic Government, politics can only be saved from corruption by a large number of citizens taking an active part in politics who have given a serious and honest attention to the questions at issue, and are determined to make their weight felt. To meet the industrial difficulties...which press upon us for solution, an impartial study of the situation, with all the aid Economic Science can give us is our only hope. In the Old World where a revolutionary socialism [he meant here the pressures on policy from big business and trade unions] is a menacing danger, I should urge this with more vehemence than you might think suitable in this place.³⁹

He repeated these sentiments in 1912 in an article entitled 'Social Study'. Ostensibly this pamphlet contained his thoughts on the Social Studies Diploma run jointly by Birmingham University and the Women's Settlement at Summer Lane. This course was, at least at this time, largely made up of women, and it aimed at giving them a university preparation for the burgeoning opportunities for Social Work: for example in local government on Education Committees, Medical Inspection in Schools, and Welfare Supervisors in factories. However, Ashley's words also give us an insight into his views on the need for expert involvement in policy. There is the same stress laid on the idea of citizenship and service through beneficent state action, the same claim that this injection of informed advice will ensure that the expanded state operates for the national good:

Besides the official of the old type and the elected councillor of the old type, we are now beginning to find a new order of people at work - the unpaid, unelected, appointed or co-opted persons of special knowledge and experience. It is practically a new state of mind on the part of legislators that we now see manifesting itself: a feeling that the powers of the State can no longer be trusted entirely either to bureaucracy or to democracy in their old forms.

He noted approvingly that 'in many different ways there is a demand for...the "expert"'.⁴⁰

Ashley believed that the need for expert advice on policy had increased as the interventionist role of the state had increased. Now that the role of the state had expanded, and before any further expansion, it was necessary to reform the machinery so that it could undertake its new responsibilities efficiently. This sentiment sprang from Ashley's belief in social evolution to meet new conditions, which we noted earlier. He argued in 1909 that:

³⁹ *Ibid.*, p.26-7.

⁴⁰ Ashley 'On Social Study', p.4 and p.3, printed for private circulation from The Year Book of Social Progress, (1912), APB, 9/iv/i.

I cannot but think that the most pressing need of the present time is not so much any great additional widening of the area of state control, as the modernization and adequate equipment of the machinery of control, and especially that in the hands of central government. The organization and procedure of each of the great departments which have to do with social legislation - the Home Office, the Local government Board, and the Board of Trade - require to be overhauled and brought up to date.⁴¹

In his 1911 introduction to Hamilton's The Federalist, which contained many of the most cogent political arguments for the American Constitution, Ashley agreed with the author that 'to "accumulate in a single body all the most important prerogatives of sovereignty" is "to entail upon our posterity one of the most execrable forms of government that human infatuation ever contrived"'. He noted the absence in The Federalist, of 'the idea that now so powerfully affects all political thinkers, the idea of development or evolution'.⁴²

Ashley found the trend which he perceived and encouraged in the Edwardian period towards bringing outside experts into policy-making flower during the First World War. He thought it a very hopeful sign that, even by 1914, the war had affected a 'dramatic transformation...in the economic policy of the Home Government' which had 'abandoned the traditional policy of economic inaction'. Every new day saw Government intervention 'extended to some new department of commerce, some branch of trade...some extensive new manufacture'. He perceived this as an extension of the existing pre-war trend towards intervention: it was 'only the sudden emergence in new fields of that fresh economic courage which has been so remarkably displayed in our recent social legislation'. Such action he noted, called 'for a huge and complicated administrative organization', and meant that the role of the government in a country which had once embarked on such measures, 'can never be as before'.⁴³ As we shall see later, Ashley benefited greatly from the expansion of government activities in wartime. Once on the inside of the machinery of government, he urged the necessity of making further use of experts in policy-making, as he had done from the outside before the war. But now he had the increased leverage of a valued insider, and while rendering

⁴¹ Ashley, 'The Present Position of Social Legislation in England', (Oxford, Christian Social Union, Oxford University Branch, 1909), pp.14-15.

⁴² Ashley, Introduction to A. Hamilton, et al, The Federalist or the New Constitution, (London, J.M. Dent [Everyman], 1911), pp.x and xiii.

⁴³ All quotations above from Ashley, 'The War and its Economic Aspects', op.cit., p.18-19.

public service, could utilize the emergency to promote his idea of the professional economist: a man of action.

Such a self-conscious championing of the active role of the economist in government was, clearly, fundamentally at odds with the professional strategy of Marshall and his School. However Ashley had no desire for further conflict, no wish to re-open the old wounds of the methodological dispute of the 1890s (embodied in the row, which was noted in the previous chapter, between Cunningham and Marshall), just because he had developed the implications of the historicist line for the involvement of economists in policy to their logical extent. Instead he side-stepped antagonism by locating a gap in the Marshallian synthesis and using this as his justification for action.

Ashley set out his position before he embarked on his intensive period of government work, in his Presidential Address to Section F of the BAAS at Leicester in 1907. His tone was conciliatory towards Marshall, as it always was, but he argued that there was no agreement among international post-Ricardian economists, even on such basic concepts as rent, profit and the like. For example:

on such a vital question as whether trade-unions could effect a general rise of wages, not only would opinions differ, but those who agreed in their answers would get at them in quite different ways.

Ashley thus discredited the Marshallian idea of consensus arguing that there 'is hardly a single point on which there is as yet any approach to unanimity.' Ashley concluded that while Marshall's effort was laudable (abstract economics was still of 'interest', and 'Its study is certainly sharpening to the wits, and it is hardly likely that all the opposing doctrines are mistaken') it should not deter the historical economist from his rather different path:

...an Englishman may feel a just satisfaction in the width of sympathies and the sober balance of judgement which mark the chief English treatise of this period [Marshall's Principles], and even an untheoretical reader will gratefully acknowledge the abundant help to be derived from Professor Marshall's knowledge and insight. My purpose was simply to show that, though there has been a new growth of abstract speculation since the first phase of orthodoxy passed away, there has not emerged a second orthodoxy so far.

and that consequently:

There is no reason why those who think that a very moderate amount of general reasoning will go a long way in the interpretation of facts, when once these facts have been collected and arranged, should be so dazzled by any of the new systems as to be checked in their own more plodding career.⁴⁴

Given the absence of consensus, Ashley argued, following the Marshallian line, that economists must not speak publicly as representatives of a unified science, but still they must speak. Here Ashley introduces his concept of active citizenship. Marshall had used the argument that the economist could only speak as a private citizen as a reason for limiting his role. Having established that there was no economic consensus, Ashley carefully argued that this freed the informed citizen to give advice:

..it behoves each of us to make it clear that, even if he is speaking ex cathedra, as people say, he is still speaking in propria persona, with all his limitations and unconscious bias; he is not the mouth piece of Science.

I venture to lay stress upon this point, because I am most anxious that economists - not as exponents of a unanimous doctrine, but as individuals who have given time and thought to industrial and commercial affairs - should have their just share in guiding national action in the future.⁴⁵ (original emphasis)

Both Ashley and Marshall rested their claim for policy influence on the economist as scientist, but each emphasised a different aspect of the scientific method, and these emphases were themselves products of a fundamental difference of opinion over methodology in economics between the Marshallians and the historicists. Such tensions did not publicly surface in the natural sciences, where a methodological consensus had been at least publicly preserved for many years. For Marshall, who emphasised the deductive, theoretical approach, the economist must publicly distance himself from policy questions, lest he compromise his objectivity, or invite a public airing of differences with other economists which could only be to the detriment of the authority of economic science. For Ashley, who emphasised the inductive, empirical approach, the economist possessed the methodological tools and the broad experience of economic conditions to be a guide to policy: to interpret policy questions to the policy-makers and to draw out from the facts the most important elements of any question.

⁴⁴ Ashley, 'The Present Position of Political Economy', op.cit., pp. 236 and 237.

⁴⁵ Ibid., pp.245-6.

This approach, combined with his religious and political beliefs pushed Ashley towards involvement in policy-making. But there was also one further proximate cause of Ashley's involvement. The Marshallians did not foresee any drastic alteration to Britain's Free Trade policy, and thus saw no pressing need for influence over policy in the short term anyway. The historicists, who thought a change more probable, were eager to ensure that new policy was framed with the benefit of their economic advice:

I recognize...that the economist's present attitude must be affected by his forecast of the future. If he thinks that all departure from the present commercial policy of this country is likely to be permanently staved off, then the preservation of a future influence is not an object worth considering. But there must be many who...will confess that change is probable...And, if so, must they not desire that the measures on which the country may embark should receive as much competent criticism in detail as can possibly be directed upon them.⁴⁶

It was this debate over Free Trade versus Tariff Reform which highlighted the differences in perception of the role of the professional economist in policy-making for both the Marshallians and the historicists. For Marshall, as we saw, it served as a reminder that the time was not yet right to seek influence (he felt that his involvement had damaged the reputation of the economists at a crucial re-formative period). For Ashley, the debate marked his first major foray into public debate and policy-making, and thus the first example of the economist defining himself through attempts to make policy.

6.3 THE PRACTICAL ECONOMIST AT WORK

6.3.1 THE TARIFF REFORM CAMPAIGN OF 1903:

The exact nature of Ashley's involvement in the public debate over tariff reform is unclear, and needs further investigation. We noted that he had despaired of the Liberals as the party of social reform and formally joined the Unionist Party in 1906. However, during the debate of 1903 he appears to have had a behind the scenes influence on Unionist policy towards Tariff Reform, in addition to the important contribution of his The Tariff Problem, (1903). His daughter wrote in her biography that his writings helped to shape Unionist policy,

⁴⁶ Ibid., p.246.

but she added that 'He seems to have been the reasonable and moderating, and therefore the centralizing and uniting, mind in the tariff reform and consequently in the Unionist ranks'.⁴⁷ There is some doubt about the degree of contact between Ashley and Chamberlain. A letter from Chamberlain of 13 May 1903 listing eleven questions needing investigation may have prompted Ashley to write his book over that Summer. But later, in a letter to John Morley, who had alleged in Parliament that the book had been written at Chamberlain's request, Ashley denied that there had at any point been, 'conference between Mr. Chamberlain and myself' and maintained that 'My book was written entirely of my own motion, and without the slightest inspiration direct or indirect'.⁴⁸ This seems to be something of a refutation of my argument on Ashley's attitude towards the role of the economist, but there were here special factors which made this a unique situation. In 1903 the full glare of publicity shone on the actions of all economists taking any part in the controversial debate, and for Ashley, the real problem was not public action itself but the risk of damaging the reputation of economics by association in the public mind with one political party. That such considerations were in his mind is borne out by the rest of the above quoted letter to Morley. Ashley's situation was complicated by the fact that he was at Birmingham University, and was by far the easiest target for accusations of political bias: he thus stressed his 'scientific independence' the more forcefully:

I want to make this clear because I realized at once...that for a Professor in the University of Birmingham to write on the subject was to expose himself to grave mis-representation, was a mere accident which brought me, on my return to England, to Birmingham. I might just as well have gone to Manchester: and there the Manifesto of the Fourteen Economists would have forced my little book out of me just the same.⁴⁹

However, despite this understandable caution there may have been closer contacts between Ashley and Chamberlain than the former was prepared to reveal. Bonar Law wrote to him in December 1904 urging him to stress to Chamberlain the importance for the Tariff

⁴⁷ Anne Ashley, *op.cit.*, p.127.

⁴⁸ Ashley to Morley, 9 February 1904, from Chamberlain Papers. cited from p.222-3, A.W. Coats. 'Political Economy and the Tariff Reform Campaign of 1903', *Journal of Law and Economics*, Vol. 11, (April 1968), pp.181-229.

⁴⁹ *Ibid.*, p.222.

Reform cause of appearing to have scientific authority on its side. His letter seems to assume that the economist had privileged access to the Birmingham politician.⁵⁰

However, notwithstanding such proximate difficulties, Ashley's attitude towards the role of the economist inside the government machine was unchanged. He recommended in The Tariff Problem, that, if retaliation were adopted, a Ministry of Trade and Commerce should be established and that its advice to government should be guided by local correspondents or delegates advised by provincial university professors of Commerce.⁵¹ This would, at least, have guaranteed Birmingham's Professor a key advisory role!

6.3.2 THE UNIONIST SOCIAL REFORM COMMITTEE (USRC)

Ashley's involvement as policy adviser to the Unionists was not confined to the Tariff Reform debate. He helped Bonar Law with economic questions at least from 1904,⁵² and was valued as an adviser by Stanley Baldwin. The latter wrote the introduction to Anne Ashley's 1937 biography of her father and, when President of the Board of Trade between April 1921 and October 1922, included Ashley's name in the permanent panel from which committees were to be appointed under the 1921 Safeguarding of Industries Act.⁵³ In Baldwin's second administration Ashley was invited to fill a place on the Balfour Committee on Industry and Trade.

But Ashley was also involved in an unofficial Unionist policy-making body - the Unionist Social Reform Committee - in the years immediately before the war. This was a neo-Fabian policy-making group founded by F.E. Smith (later Lord Birkenhead) in April 1905, which aimed to re-invigorate Unionism by supplying it with a coherent social policy harking back to the perceived traditional paternalistic principles of Tory democracy.⁵⁴ The USRC

⁵⁰ 'There is one point...which..I wish you would bring to the notice of Mr. Chamberlain. There is nothing, I think, which tells more against us than the idea that scientific authority is against us', (original emphasis), Bonar Law to Ashley, December 1904, quoted in Anne Ashley, op.cit., p.135.

⁵¹ Ashley, The Tariff Problem, (1903), pp.133-6. See Coats, op.cit., p.209, footnote 77.

⁵² See letter from Law to Ashley, December 1904, asking for occasional economic advice, in Anne Ashley, op.cit., p.134.

⁵³ See Ashley Official Papers, British Library, London (hereafter referred to as AOP), Add. Mss. 42,253, VolXII, f.151 and following.

⁵⁴ On the USRC see Jane Ridley, 'The USRC, 1911-14: Wets Before the Deluge', Historical Journal, Vol.30, No.2, (1987), pp.391-413.

operated outside of official party machinery perhaps as a model of the kind of policy-making body its members would have liked to have seen within the party, or even within the government machinery. The sub-committees reported on current bills on the poor law, housing, agriculture, education, industrial unrest and health. There was considerable involvement of outside expertise: Morant and the Webbs were closely involved with the health report and Ashley was a member of the sub-committee on industrial unrest⁵⁵ and was singled out in the published report for special mention for his contributions both 'in discussion and in writing'. So great was Ashley's part felt to be that his permission was obtained to add his name as co-author.⁵⁶ Of the report's many recommendations, the most interesting for our present purposes, and the one which seems to have been suggested by Ashley, was that there should be an improvement in the statistical information available to government. This was to be achieved by the creation of a permanent statistical section of the Labour Department, charged with preparing annual reports; by the compilation of physiological and dietary reports by a departmental committee of physiological experts; and by the creation of an inter-departmental Statistical Committee.⁵⁷

6.3.3 WAR WORK

But it was during the war that Ashley was able to put his principles most fully into practice and become active in policy-making. Clapham noted in his obituary that: 'In a way...the war brought him satisfaction, as it did to many who after studying affairs, were called to share in them'.⁵⁸ I will discuss briefly here one further key example of Ashley's war work, to underline the points already made by the material on his role in the Royal Society's Food (War) Committee (FWC) in chapter four.⁵⁹ Thus I will concentrate here on Ashley's role in the Committee of Economists (COE) of the Board of Trade set up in 1916. This further example has been chosen as it has been totally neglected in the existing literature on

⁵⁵ Ashley also signed the 1913 report 'A Unionist Agricultural Policy', although he does not seem to have been a member of the sub-committee. See Ridley, *op.cit.*

⁵⁶ J.W. Hills, Professor William James Ashley and Maurice Woods. Industrial Unrest - A Practical Solution. The Report of the USRC, (London, John Murray, 1914). Quotation is from the Preface, p.iii

⁵⁷ *Ibid.*, pp.36-7.

⁵⁸ Clapham, *op.cit.*, p.682.

⁵⁹ See the Appendix to this chapter for a list of Ashley's war work.

the role of economists in government,⁶⁰ and also (just as was the case with the FWC) while he served on the COE, Ashley used his position to put forward recommendations for further future involvement for economists in policy-making.

Ashley was originally invited to serve on the Committee of Economists in early 1916 by S.J. Chapman, the Professor of Economics at University College, Manchester 1901-17, who was then working at the Labour Exchange Department of the Board of Trade. Chapman wrote that the Board of Trade was thinking about post-war and demobilisation problems and was keen to recruit economists for a committee.⁶¹ The Committee seems to have held its first meeting on 7 June 1916 at 6 Whitehall Gardens. The purpose of this meeting was:

to arrange for the co-operation of a number of economists with the Board of Trade, in the preparation of industrial reports with special reference to employment in the various industries of the United Kingdom in the period succeeding the war.⁶²

The meeting was chaired by Llewellyn Smith and many of the most notable contemporary economists were present: including Ashley, Cannan, Chapman, Clapham, Gonner, Pigou and Scott.⁶³ It was agreed to assign a group of industries to each economist, and that a preliminary report should be submitted for discussion among all of them by 1 November 1916.⁶⁴ The slant was to be 'primarily industrial, with special reference to employment'.⁶⁵

⁶⁰ See for example the articles by Furner and Supple, Winch and Harris in Furner and Supple (eds.), The State and Economic Knowledge, (Cambridge, CUP, 1990), none of which mention the institutional novelty of the Committee of Economists; and Jose Harris, 'Bureaucrats and Businessmen in British Food Control, 1916-19', which sees food as a battle-ground between these two groups and does not mention any role for outside academic experts.

⁶¹ Chapman to Ashley, 1916 (probably April), AOP, Add. Mss. 42.247A, Vol. VI (1), f.159.

⁶² Minutes of first meeting of the Committee of Economists of the Board of Trade, titled 'Arrangements made in Connection with Post-War Reports on Employment', AOP, Vol. VI(1), op.cit., ff.166-7. Quotation is from f.166.

⁶³ Present at the first meeting were: Smith, Beveridge, Percy J. Ashley, Ashley, Cannan, Chapman, Clapham, Gonner, Professor H.M. Hallsworth, Professor A.W. Kirkcaldy, Professor D. Knoop, Pigou, Professor W.R. Scott, Professor J.A. Todd, Mrs. F. Wood, Mr. C.K. Hobson and Mr. H. D. Henderson. Extra members were added later: Miss Anne Ashley, Miss W.A. Elkin, Miss D.P. Etlinger, J.W. Nixon, and J Hartley Withers from the Treasury. See Minutes of First Meeting, op.cit. and Minutes of Fourth Meeting, AOP, Vol VI(1), op.cit., f.219.

⁶⁴ The work was finally distributed as follows: Chapman: cotton; Ashley: general and constructional engineering; Cannan: paper and printing; Clapham: woollen and worsted; Elkin: tinsplate, galvanised sheets, metal manufacture other than iron and steel, textile dyeing, finishing and bleaching; Etlinger: electrical engineering; Gonner: shipping and shipbuilding; Hobson: iron and steel; Jackson: jewellery; Kirkcaldy: marine engineering, cycles and motors; Knoop: cutlery, china and earthenware, glass, implements and tools; Nixon: rubber; Pigou: building, quarries, brick and cement, wood and furniture trades; Scott: food, drink and tobacco; Tillyard: tailoring, shirt- and dress-making; Todd: raw cotton supply, jute, hosiery, lace, boot and shoe; Wood: chemical trades. Taken from General Report of the Committee of Economists Appointed by the Board of Trade to consider the Probable State of Industry after the War, with Special Reference to Employment, (privately printed, 1917), ff. 245-289, AOP, Vol. VI(1), op.cit.

However, though the government desired economic advice, it firmly indicated that the experts should know their place: be on tap but not on top. To this end, it was made clear at the first meeting that:

The Reports are...to be concerned primarily with what the position will be rather than with what ought to be done. The Economists need not regard themselves as debarred from making any practical suggestions that may occur to them, but, where possible, any such suggestions should be made in a supplementary part of the report.⁶⁶

No doubt so that they could be ignored more easily. Likewise, although the economists were to be given access to all the relevant information held by the Board of Trade, they were expressly forbidden from making enquiries among employers, traders or trade unions, or visit any district in an official capacity without gaining the prior permission of the Board.⁶⁷

The Committee met again on 7 February, 14 March and 2 May 1917, though these meetings would usually be continued for three days from the original date. The importance of standardising the various reports was stressed at these meetings.

The final Report appeared in 1917 and ran to some eighty nine pages. Perhaps most interesting here are its recommendations and suggestions. The general tone of these was interventionist, nationalist, concerned with social welfare and technocratic. These themes came together in its advocacy of 'An Economic General Staff':

During the course of the war governmental control has been extended over many fields where it did not exist before. It is certain that for some time after peace has been restored measures of control will need to be enforced...During the war machinery for exercising control has been developed through the War Office, the Ministry of Munitions, the Board of Trade, the Board of Agriculture, the Ministry of Food, the National Service Department, and the various "Controllers" and special Commissions who have been appointed from time to time. Even now serious conflicts arise between these different authorities. When peace returns and an entirely new situation has to be faced...the danger of friction, overlapping and divided counsels is bound to be much enhanced. To obviate this danger we strongly urge that attention should be paid in time to the problem of co-ordinating the various authorities...To prepare for and supervise the transition from war conditions to peace conditions an "economic general staff" should be built up and organised forthwith.⁶⁸

⁶⁵ Minutes of First Meeting of Committee of Economists. op.cit., f.166.

⁶⁶ Ibid.

⁶⁷ Ibid.

⁶⁸ General Report of the Committee of Economists..., op.cit., f.256.

It appears that this section was compiled by Ashley, Clapham and Pigou.⁶⁹ It is obviously impossible to tell who had the major hand in the drafting of this section, though the sentiments chime well with what has been argued about Ashley's views about the role of the economist and its formalisation in government.

The report was privately printed and its circulation was restricted to the War Cabinet. The other recommendations echoed the sentiments described above: for example there were calls for greater involvement of outside experts, notably in a proposed census of modern machinery to be carried out by an expert committee. It was also advised that an expert committee should consider the future of the National Factories. There was also a marked concern for national welfare, and a desire for continued interventionist policies to secure it: for example, two new Boards of Control, one to vet British foreign investment for anti-national repercussions, and one along the lines of the Development Commission, to make special grants in aid to enterprises developing sources for important raw materials or providing for urgent social needs at home, were suggested. There were also proposals to expand the role of worker/management committees into security and conditions of work; to increase technical education, relevant to local industry; a commitment to public works to relieve unemployment in a post-war depression, after an initial settling down period for industry, so as not to upset the natural business-cycle; and plans to extend the Insurance Act and stagger demobilisation. All-in-all a managed approach to the peace time economy was proposed, with a considerable input from experts.⁷⁰

Ashley's direct involvement with the Committee of Economists seems to have ended after this report, though Llewellyn Smith did write to him in August 1917, seeking his opinions on the new topic which the Committee of Economists was considering, war-time price inflation in Britain. In his reply Ashley again argued for the formalisation of the role of

⁶⁹ See Minutes of Third Meeting of Committee of Economists, AOP, Vol.VI(1), op.cit., f. 217, where this point is discussed: 'The danger of too many departments attempting to control industry during the period after peace is restored. The Committee decided to recommend that one body only should be responsible for control - a draft suggestion to this effect to be written by Professor Ashley, Dr. Clapham, and Professor Pigou, and to be discussed at the next meeting'.

⁷⁰ See General Report of Committee of Economists..., op.cit.

the economist in government. He suggested a new committee to establish whether or not there was any inflation and added:

the formal appointment of such a Committee would appear preferable to a Memorandum from particular individuals, because it would render confidentially available information which otherwise might be inaccessible; and the conclusions, if the Committee were properly constituted, would carry more weight.

In so-saying Ashley aptly reminds us of the difference between his view of the role of the economist and that which Marshall thought was appropriate in the short term.

6.4 CONCLUSION

There were two distinct versions of the idea of the professional economist put forward in late nineteenth and early twentieth century Britain. Marshall's was based on the image of the economist as objective scientist and produced a negative public science which stressed the distance which should be maintained between economics and politics. The economist was a scientist whose specialised, compartmentalized form of knowledge could not, and should not seek to frame policy, which was the common sense art of considering national issues from a range of perspectives. This was best done by the generalist politician. However, this line both contributed to (in the longer term) and masked (in the short term) a strategy for political influence. Marshall's plan was to build up the public reputation of economics as an objective theoretical science, by disassociating it with politics: for he felt that the standing and thus potential influence of classical economics had suffered a decline by its attachment in the public mind too exclusively with the political position of laissez-faire. Once economics was firmly perceived as a science, and once theoretical differences had been resolved in the acceptable general theory of welfare economics (begun by Marshall and completed by his disciple Pigou) then the foundations would have been laid for a safe return to policy influence. In the mean time, in spite of the negative public science, these economists still enjoyed a privileged access to government via informal (privately requested memoranda) and ad hoc (committees and commissions) channels.

Ashley, as a representative of a form of historical economist, posited a very different version of the professional economist. This proposed that the economist should not be bound

by theory, but should base his claim to influence on having a wide empirical experience of economic conditions. His expertise lay in being a general interpreter of these conditions. His authority rested more on his ability to collect relevant facts and to interpret them in the light of the evolution of economic conditions and local and national institutions. This approach produced a more politically radical public science, which aimed at securing immediate influence over policy for the economist. In fact it was claimed that the economist was partly defined by his involvement in shaping national policy. Thus Ashley involved himself as much as he could in the existing machinery of government and pressed for the institutional formalisation of the role of the economist in policy-making, through an economic general staff, from inside.

In fact, because of the methodological dispute in economics, each of the above positions stressed one element of the scientific method (as the term was used in the natural and medical sciences) over the other: Marshall the deductive; Ashley the inductive. It was not until the Marshallian paradigm was firmly in place that such tensions finally died. Keynes, as we shall see, felt able to talk technocratically about the need for economic scientists in the policy-making process, with less fear that his audience would wonder which method these economists would be using. By the 1920s Marshallianism had triumphed: historicism had been contained within economic history, and a methodological consensus was emerging within the profession of economics, as in science.

6.5 LIST OF ASHLEY'S MAJOR GOVERNMENT WAR WORK

1. From October 1914: Intelligence Officer for the Birmingham Citizens' Committee, and Local Correspondent to the Local Government Board. He wrote in glowing terms of the Committee's work that 'There has never been a time when so much thought has been put into the distribution of relief, when so much expert knowledge of industrial conditions has been invoked....Surely it furnishes the beginnings of a permanent Civic Organization'.¹
2. February 1915: member of Board of Trade Departmental Committee on Retail Coal Prices. (See Cd. 7866).
3. July 1915-June 1916: member of the food sub-committee of the Sectional Committee on Physiology, or Physiology (War) Committee, of the Royal Society.
4. November 1915: becomes member of Huth Jackson Committee on Trade Relationships After the War. (In September 1915 Ashley had previously prepared a memo for this committee on the relation between the economic position of the U.K. and military service, from the perspective of recruitment versus maintenance of exports).
5. Beginning May 1916: writes memorandum on Reparations for Prime Minister (Vaughan Nash asks Llewellyn Smith at Board of Trade who asks Ashley). Has some, though not much, help from Keynes.
6. June-September 1916: member of the Board of Trade Departmental Committee on Food Prices.
7. June 1916-July 1917: member of Committee of Economists attached to the Industrial (War Enquiries) Branch of the Board of Trade, engaged in considering state of industry after war, with particular emphasis on labour.

¹ Ashley, 18 November 1914, cited in Anne Ashley, *op.cit.*, p. 150.

8. February 1917- July 1917 : second period of service on Royal Society Food (War) Committee, as it is now called. Considers British food supplies: including scientific studies of nutritional requirements and practical schemes for rationing. Is knighted in 1917 for war work.

9. 1918: member of three Committees: (i) February-June, member of Ministry of Food Consumers Council; (ii) March-November, member of Sumner Committee (Treasury) on the rise in the cost of living of the working classes: causes and counterbalancing factors; (iii) April 1918-March 1919, member of Departmental Committee on Cost of Living of Rural Workers (Agricultural Wages Board) Ashley resigned after ninth meeting and A.L. Bowley (Prof. Statistics, University of London) took his place.

PEACE WORK:

1. June 1919-February 1920: member of Royal Commission on Agriculture

2. November 1921: Chairman of the Board of Trade Departmental Committee on the Glassware Industry, set up under the Safeguarding of industries Act of 1921.

3. December 1922-May 1924: member of Agricultural Tribunal with Prof. W.G.S. Adams and Prof. D.H. McGregor. To enquire into optimum food production methods with reference to wages of agricultural labour.

4. 1923: member of Tariff Advisory Committee, whose job was to advise the Board of Trade Departmental Committee on the framing of a general tariff. Milner was Chairman. Other members: Hewins (only attended first and last meetings as busy trying to get elected as M.P. for Swansea), Kysant, Peter Rylands, Algernon Firth, Pugh. Work interrupted by general Election. Report drawn up but not published.

5. 1925-6: member of Balfour Committee on Industry and Trade. Chairman: Sir Arthur Balfour (Lord Riverdale), a Sheffield steel magnate and no relation to A.J. Balfour.

CHAPTER SEVEN

THE ECONOMIST AS PHILOSOPHER KING: THE ETHICAL PUBLIC SCIENCE OF J.M. KEYNES

No! The economist is not king; quite true. But he ought to be! He is a better and wiser governor than the general or the diplomatist or the oratorical lawyer.¹

In the 1920s Keynes (like Ashley before him) departed from the Marshallian public stance, and actively sought a new positive role for the economist in policy-making in the short-term, and new governmental mechanisms through which to express it. But for Keynes this new role sprang from the pursuit, in theory and practice, of an ethical ideal: a vision of a utopian society. Like the historical economists, Keynes sought a middle way between capitalist individualism and state socialism. But with Keynes the role of the economist, armed with new theoretical weapons, was central in facilitating the new society. Thus a new public science emerged in economics: a new rationale for the involvement of economists in policy-making. Keynes argued that policy decisions would not only be more scientific if the economist was involved, but that they would be more ethical. For Keynes the usefulness of economics did not rest on its scientific nature alone, but on the assertion that science could usher in the new society.

That science was thus invested with ethical, and concrete political, purposes was not problematical for Keynes, as it was for Marshall. Keynes' perception of the role of the economist was similar to Ashley's. But here Moorean ethics took the place of Christian social duty as the spur to political involvement. Also, both the form of the ideal society, and the role of economists in creating it, reflected Keynes' own perception of a new kind of political Liberalism, and his Platonic elitism.

Furthermore, unlike Ashley, but like Marshall, Keynes was a theorist. By the time he was rising to public prominence as an economist in the 1920s, economics was a profession

¹ J.M. Keynes. 'Reconstruction in Europe: An Introduction', Manchester Guardian Commercial, 18 May 1922, in Collected Writings (hereafter CW followed by volume number) Vol. XVII, pp. 432-3.

with a recognised sphere of knowledge and an established methodology. Thus Keynes, in one way, built on the work of Marshall: he felt more free to pronounce on controversial policy questions since economics had now established some social and cultural authority. In fact, Keynes sought to re-use Marshall's strategy: Keynes himself, like Marshall, wished to develop and have accepted a new general theory, on which all policy advice could be based. So, in spite of the fact that, as we noted, Marshall's successor, Pigou, adhered in public rigidly to the early Marshallian line of distance from policy questions, it can be argued that Keynes was taking forward Marshall's professional strategy along the path Marshall himself had intended, once the status of economics had been assured.

In this chapter, I will want to draw on recent Keynesian exegesis which stresses the centrality of his early ethical position to his whole economic endeavour,² and to add to this the extra dimension of how his 'vision' and his 'philosophy of practical action'³ translated into a new type of call for economists in policy-making.

7.1 THE UTOPIAN SOCIETY: THE ROLE OF THE ECONOMIST IN ITS CREATION

Keynes' enduring ethical position was formulated under the influence of the work of G.E. Moore, and particularly his Principia Ethica of 1903. Keynes first read this in a formative period, as an undergraduate at Cambridge. In 1938 he was still committed to it. He declared: 'I see no reason to shift from the fundamental intuitions of Principia Ethica....It is still my religion under the surface'.⁴ Moore propounded an elitist ethics which held that the most valuable things were 'certain states of consciousness...the pleasures of human intercourse and the enjoyment of beautiful objects' and that 'it is only for the sake of these

² For example: Atholl Fitzgibbons, Keynes's Vision: A New Political Economy, (Oxford, Clarendon, 1990, originally 1988); R. Skidelsky, John Maynard Keynes. Vol.I: Hopes Betrayed, 1883-1920, (London, Macmillan, 1983); and 'Keynes's Political Legacy', pp.3-28 in Hamouda and Smithin (eds.), Keynes and Public Policy After Fifty Years. Vol.I: Economics and Policy, (Aldershot, Edward Elgar, 1988); 'Keynes's Philosophy of Practice and Economic Policy', pp.103-41, in O'Donnell (ed.), Keynes as a Philosopher Economist, Ninth Keynes Seminar, University of Kent at Canterbury, 1989, (Houndmills, Macmillan, 1991); and R. O'Donnell 'Keynes Political Philosophy', pp.3-28 in Barber (ed.), Perspectives on the History of Economic Thought Vol.VI Themes in Keynesian Criticism and Supplementary Modern Topics, (Aldershot, Edward Elgar, 1991).

³ Fitzgibbons, op.cit., Preface, p.v.

⁴ Keynes, 'My Early Beliefs', CW IX, p. 444.

things - in order that as much of them as possible may at some time exist - that anyone can be justified in performing any public or private duty'.⁵ This philosophy underlay Keynes work in two ways: it was a motivation to social reform, and a justification of elitism.

These two came together in Keynes' vision of the ideal society and how it was to be achieved. Keynes was not content with capitalist individualism, nor with state socialism. He envisaged a middle way: a society in which the economic problem was solved. An equitable distribution of wealth would lead to the decline of the money-making motive and to a new morality. In the new society, Keynes argued in 1930:

I see us free...to return to some of the most sure and certain principles of religion and traditional virtue - that avarice is a vice, that the exaction of usury is a misdemeanour, and the love of money is detestable, that those walk most truly in the paths of virtue and sane wisdom who take least thought for the morrow. We shall once more value ends above means and prefer the good to the useful. We shall honour those who can teach us how to pluck the hour and the day virtuously and well, the delightful people who are capable of taking direct enjoyment in things, the lilies of the field who do not toil, neither do they spin.⁶

The existing framework of capitalism was to be retained in the short term so that the accumulation of capital by compound interest and scientific/technical advance could combine with 'avarice, usury and precaution' to solve the economic problem: 'For only they can lead us out of the tunnel of economic necessity into daylight'.⁷ Keynes believed that change, though gradual, would be automatic. Only the pace of change was alterable. This could be influenced by four things: our power to control population; avoidance of foreign and civil wars; rate of accumulation of capital and 'our willingness to entrust to science the direction of those matters which are properly the concern of science'.⁸ In this early version, the form of the new society was unclear as were the tasks of science. However, by 1936, and the publication of the General Theory, Keynes had a more developed image. The appearance of the new society

⁵ G.E. Moore, Principia Ethica (1903), pp. 188-9, cited from Skidelsky, 'Keynes's Philosophy of Practice...', op.cit., p.105-6.

⁶ Keynes, pp. 330-1, 'The Economic Possibilities for Our Grandchildren, CW IX, pp. 321-32, (1930).

⁷ Ibid., p. 331.

⁸ Ibid.

would not be automatic but managed. He now argued that it was the (Keynesian) economist who could bring about the appearance of the new society by advising governments to lower the rate of interest, ending the scarcity of capital and thus causing the 'euthanasia of the rentier, and consequently, the euthanasia of the cumulative oppressive power of the capitalist to exploit the scarcity of capital'.⁹ This would lead not only to fairer wealth distribution and full employment, but would also, Keynes argued, prevent war:

...if nations can learn to provide themselves with full employment by their domestic policy (and, we must add, if they can also attain equilibrium in the trend of their population), there need be no important economic forces calculated to set the interests of one country against that of its neighbours.¹⁰

Keynes now saw the economist not only as being able to remedy all the drags on the pace of change which he had identified in 1928 (with the exception of population control, which was the concern of other scientists), but also as initiating the change to the new society.

I want to argue that this was a type of public science, which emphasized the scientific skill of the economist as the facilitator of an ethically superior society. The emphasis was on the ethics. It was a rhetoric which stressed, as Keynes had put it in 1928, the 'ends [ethics] above the means [science] and prefer[red] the good to the useful'. The economist was useful because he was good. Keynes saw economics as a practical ethical mission. He wrote that: 'I want to emphasise strongly the point about economics being a moral science...it deals with introspection and with values'.¹¹ He favoured the inclination of Malthus who had,

...approached the central problems of economic theory by the best of all routes. He began to be interested as a philosopher and moral scientist, one who had been brought up in the Cambridge of Paley, applying the a priori method of the political philosopher.¹²

We come back, then, to the thrust of our opening quote. The economist should be king: should be closely involved in policy-making. Only he was capable of understanding the

⁹ Keynes, The General Theory of Employment Interest and Money, (London, Macmillan, 1936), p.376.

¹⁰ Ibid., p.382.

¹¹ Keynes, CW XIV, p. 300, cited from Fitzgibbons, op.cit., p. 34.

¹² Keynes, CW X, p. 107, cited from Ibid., p. 195.

fundamental nature of modern society. Even before the new society, it was only the economist who could manage policy to create wealth, and only he could solve the economic problem and usher in the ideal society. The opening quote continued:

'In the modern over-populated world, which can only live by all the nice adjustments, he is not only useful but necessary. It is he who can provide the mayor with a good house within whose comfortable walls the mayor can collect for himself the other ingredients of a good life. But where the rulers of the state dethrone the economic power in favour of the false idols of diplomacy or any other of M. Hanotaux's mystic and incalculable forces, squalor follows, and the Mayor of Pargnan lives and dies in a cellar.'¹³

Keynes' ethical position, his economics and his views on the role of the economist were formulated as a response to contemporary problems of war, unemployment, socialism, the decline of Keynes' natural home, the Liberal Party, and the challenge of totalitarianism. Keynes' intellectual endeavours were part of what Skidelsky has called the 'second liberal revival' of the interwar period when liberalism perceived its role as averting social revolution by moderating capitalism.¹⁴

However, recent Keynes scholarship has raised the question of whether Keynes became disillusioned, and whether in his later conception of the ideal society he was forced to become more limited, more conservative, and to retain unfettered capitalism. Fitzgibbons has argued that Keynes lost faith in the perfectibility of human nature, and thus doubted the possibility of the end of the money-making motive.¹⁵ Skidelsky has argued that the Keynesian ideal society was classic liberalism with a managerial philosophy of *ad hoc* intervention.¹⁶ I would argue that these analyses confuse Keynes' short-term aims with the change in morality that Keynes believed was only possible for the utopian society in the long run. I would also argue that this confusion is readily understandable given these authors' failure to take into

¹³ Keynes, pp. 432-3, 'Reconstruction in Europe...', *op.cit.*. The reference to the Mayor of Pargnan is a response to a (possibly apocryphal) anecdote from the article contributed to the Manchester Guardian supplements on reconstruction by Gabriel Hanotaux, the former French Minister of Foreign Affairs. The Mayor had complained to Hanotaux that in spite of all diplomatic efforts his house remained ruined from 1914, and he was forced to live in his cellar, where he invited Keynes to stay.

¹⁴ Skidelsky, 'Keynes' Political Legacy', *op.cit.*, p.15.

¹⁵ Fitzgibbons, *op.cit.*, p.197, for example.

¹⁶ See Skidelsky, 'Keynes' Political Legacy', *op.cit.*, pp. 14-16. Quotation from p. 15.

account the different audiences which Keynes was writing for in different works. When writing as an economist, Keynes stressed the need to retain capitalism, partly because he restrained his radicalism when addressing an audience of professional economists, and partly because of a related consideration: his belief in the limitations of predictive science, and his accompanying belief in the inadvisability of risking a short-term good for a, necessarily uncertain, long term gain. Keynes famously wrote in 'A Tract on Monetary Reform' in 1923 that, 'in the long run we are all dead', but the rest of this quote is also informative. Here he stressed that the long run was 'a misleading guide to current affairs' and argued that economists must seek to utter useful things about current problems, rather than useless platitudes about the return of equilibrium in the long term: 'Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is long past the ocean is flat again'.¹⁷ However, I want to argue that this part of the quote can also be interpreted to mean that when making long run predictions, the economist should not speak merely in technical, scientific terms about the cyclic nature of business trends, but should also, if he so believes, talk of fundamental changes in the long run to the nature and purpose of that cycle. Keynes warned of confusing these short and long-term goals, writing in 1936 that:

The task of transmuting human nature must not be confused with the task of managing it. Though in the ideal commonwealth men may have been taught or inspired or bred to take no interest in the stakes [of money-making], it may still be wise and prudent statesmanship to allow the game to be played, subject to rules and limitations, so long as the average man, or even a significant section of the community, is in fact strongly addicted to the money-making passion.¹⁸

As Keynes wrote: 'The Republic of my imagination lies on the extreme left of celestial space'.¹⁹ When writing of short-term change for a professional economic audience, he was apt to stress the 'moderately conservative...implications' of his theories.²⁰ Thus in the General Theory, he talked of aiming at an economic order in which the 'full potentialities' of the Manchester System could be realised, to ensure 'personal liberty', 'personal choice',

¹⁷ Keynes, p. 65, 'A Tract On Monetary Reform', (1923), CW IV.

¹⁸ Keynes, General Theory, op.cit., p. 374.

¹⁹ Keynes, pp. 308-9, 'Liberalism and Labour', (1926), CW IX. My emphasis.

²⁰ Keynes, General Theory, op.cit., p.377.

'efficiency and freedom'.²¹ However he had used exactly the same language in 1926 in explaining why he was fundamentally attached to the Liberal Party:

The political problem of mankind is to combine three things: economic efficiency, social justice and individual liberty. The first needs criticism, precaution, and technical knowledge; the second, an unselfish and enthusiastic spirit, which loves the ordinary man; the third, tolerance, breadth, appreciation of the excellence of variety and independence, which prefers, above everything, to give individual opportunity to the exceptional and the aspiring.²²

However, when, as in 'The Economic Possibilities for our Grandchildren' Keynes took on a visionary theme, and a much longer perspective, he had a more optimistic view of the probable complete demise of the money-making motive as an end in itself, and thus the possibilities for the development of the nobler side of human nature.

Moreover, in confusing the short and the long run, these accounts also mistake realism for disillusionment. Keynes realised that human nature could not be quickly or automatically transmuted. He also realised that money-making would be necessary in utopia, but believed that the removal of poverty would enable us to:

...assess the money-motive at its true value. The love of money as a possession - as distinguished from the love of money as a means to the enjoyments and realities of life - will be recognised for what it is, a somewhat disgusting morbidity, one of those semi-criminal, semi-pathological propensities which one hands over with a shudder to the specialists in mental disease.²³

I would argue that perhaps the only shift in Keynes' thought here was that whereas in 1928 he believed that the change in morality would follow automatically from the solution by economists of the economic problem, by 1936 he realised that this change *might* have to be induced. By 1936 he was talking of the economist advising the prudent statesman to manage the 'transitional phase' (the 'rentier aspect of capitalism') which would 'disappear when it has done its work'.²⁴ He believed that with this disappearance 'much else in it will suffer a sea-

²¹ *Ibid.*, p. 379; and p. 381.

²² Keynes, p. 311, 'Liberalism and Labour', *op.cit.*

²³ Keynes, p. 329, 'Economic Possibilities...', *op.cit.*

²⁴ Keynes, *General Theory*, *op.cit.*, p.376.

change',²⁵ but if this sea change did not eradicate the love of money as an end, utopia could be hastened by longer term methods. Keynes indicated that, 'in the ideal commonwealth men may have been taught or inspired or bred to take no interest in the stakes'.²⁶

More importantly for our present theme, in both the long and the short term, Keynes stressed the critical role of intellect in formulating policy to hasten the arrival of the ideal commonwealth. In the shorter term the 'economic problem...should be a matter for specialists'.²⁷ In the longer term 'it is ideas, not vested interests, which are dangerous for good or evil'.²⁸ In 1925 in 'Am I a Liberal?', Keynes argued that his 'fundamental position' on policy-making was the importance of thought:

I believe that in the future, more than ever, questions about the economic framework of society will be far and away the most important of political issues. I believe that the right solution will involve intellectual and scientific elements...²⁹

Keynes wanted to harness the energies of capitalism to produce utopia, but these potentially amoral forces were to be guided aright by science. Like H.G. Wells' hero Clissold, Keynes was 'to the Left - far, far to the Left; but he seeks to summon from the Right the creative force and the constructive will which is to carry him there [to the ideal commonwealth]'.³⁰ Keynes wanted to tap the intellectual power of academic economists and harness it to his moral vision. He believed that, 'The remoulding of the world needs the touch of the creative Brahma. But at present Brahma is serving science and business, not politics or government'.³¹ He castigated Wells for underestimating the potential of the Universities: '...they may yet become temples of Brahma which even Siva will respect'.³² In Keynes' scheme, with capitalism serving the ultimate goal of the ideal commonwealth by providing the prerequisite

²⁵ Ibid.

²⁶ Ibid., p. 374.

²⁷ Keynes, p. 332, 'Economic Possibilities...', op.cit.

²⁸ Keynes, General Theory, op.cit., p.384.

²⁹ Keynes, p. 295, 'Am I a Liberal?', (1925), CW IX, pp. 295-366.

³⁰ Keynes, p. 319, review of The World of William Clissold by H.G. Wells, CW IX, pp. 315-20 (originally from the Nation and Athenaeum, 22 January 1927).

³¹ Ibid.

³² Ibid., p. 320.

elimination of poverty, even classical economists, guided by Keynesian theory, could be useful and moral!

7.2 KEYNES AND THE THEORY AND PRACTICE OF POLICY-MAKING

Keynes, then, had created an ethical rationale, a new ethical public economics, for the involvement of economists in policy. But how should the economist set about obtaining influence? Skidelsky argued that: 'Keynes believed that the economic problem of his day was an intellectual and not a structural or institutional problem'.³³ I want to argue that Keynes had a theory of policy-making which incorporated an element of institutional change. Briefly, it consisted of three stages, which in practice could run concurrently. The first was a Kuhnian scientific revolution: establishing a new dominant paradigm amongst the professional economic community; the second was to get the theory accepted by the political leaders, the wider social elite of business, and the public. This would lead to a new governmental agenda: a new conception of the role of government in the economy. The third, following from the first two, was to create a new body, within the machinery of government, through which economists could work towards the utopian society.

As Wayne Parsons has argued, Keynes has been portrayed as being politically naive: as overestimating the power of ideas and rationality in policy-making, and of failing to understand that ideas are unlikely to be adopted unless they serve the interests of the dominant social elite.³⁴ However, Parsons argued that Keynes realised that ideas had to appear to serve the interests of the dominant social groups to be taken up by them. Keynes understood that the domination of Ricardian economics:

...must have been due to a complex of suitabilities in the doctrine to the environment into which it was projected...That it could explain much social injustice and apparent cruelty as an inevitable incident in the scheme of progress, and the attempt to change such things as likely...to do more harm than good, commended it to authority. That it afforded a measure of

³³ Skidelsky. 'Keynes' Political Legacy', *op.cit.*, pp. 15-16.

³⁴ W. Parsons, 'Keynes and the Politics of Ideas. History of Political Thought, Vol.IV, (1983), pp.367-392. Parsons cites the work of Harrod and Moggridge, for example, as adhering to this view. See R.F. Harrod, The Life of John Maynard Keynes, (London, Macmillan, 1951); and D.E. Moggridge, Keynes, (London, Macmillan, 1979, originally 1976).

justification to the free activities of the individual capitalist, attracted to it the support of the dominant social force behind authority.³⁵

After the upheavals of the First World War, Keynes, as we noted, no longer thought that new economic ideas would eventually influence policy automatically. There was a time-lag between theory and influence on policy, which could only be overcome by direct action. As Keynes famously wrote at the very end of the General Theory, ideas were very potent 'over a period of time':

...the ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back. I am sure that the power of vested interests is vastly exaggerated compared with the gradual encroachment of ideas. Not, indeed, immediately, but after a certain interval; for in the field of economic and political philosophy there are not many who are influenced by new theories after they are twenty-five or thirty years of age, so that the ideas which civil servants and politicians and even agitators apply to current events are not likely to be the newest. But soon or late, it is ideas, not vested interests, which are dangerous for good or evil.³⁶

That Keynes had thought along these lines since the end of the war is demonstrated by the manner in which he made the same point in an article on Russia for the Manchester Guardian in July 1922. Writing about the economic doctrines (or lack of consciously applied ones) that underpinned the Revolution, he commented:

The leaders, in Russia as elsewhere, were politicians not economists, and, taking their economics from the atmosphere, were equally open to new economics from a new atmosphere.³⁷

If the economist wanted new ideas to influence current policy, he had actively to seek such influence. He had to accelerate the natural osmotic process of absorption of ideas into the

³⁵ Keynes, General Theory, op.cit., pp. 32-3.

³⁶ Ibid., pp. 383-4.

³⁷ Keynes, p. 436. 'Russia', Manchester Guardian Commercial, 6 July 1922, CW XVII. This was one in a series of articles under the general title of 'Reconstruction in Europe' which appeared throughout the Summer of 1922. See also footnote 1 above.

'atmosphere' of accepted wisdom, and thence into policy, by his own propagandist efforts. He had to create his own new 'atmosphere'.

Parsons argued that Keynes had a strategy by which ideas could be made to influence policy. The first task of the economist was to establish a consensus in the professional economic community about the new idea. This was the purpose of the General Theory. Keynes made this purpose clear from the very first words of the Preface, stating that: 'This book is chiefly addressed to my fellow economists'.³⁸ He continued that the work was,

...an attempt by an economist to bring to an issue the deep divergences of opinion between economists which have for the time being almost destroyed the practical influence of economic theory, and will, until they are resolved, continue to do so.³⁹

Keynes was thus here following the strategy of Marshall and Pigou and creating a new general theory within which he hoped all economists could work; like them he was trying to create a new theory of policy-making.

Secondly, the economist should popularize his ideas, and demonstrate their benefits to political leaders. Thus Keynes associated himself with the Liberal Party, was a member, and worked at its Summer schools during the 1920s. The economist should also seek a wide currency for his ideas among the general public. Keynes knew that public opinion was a potent way to influence political leaders:

Even if economists and technicians knew the secret remedy, they could not apply it until they had persuaded the politicians; and the politicians, who have ears but no eye, will not attend to the persuasion until it reverberates back to them as an echo from the great public.⁴⁰

This Keynes did in the 1920s with numerous articles in the Nation and Athenaeum and the Manchester Guardian. The goal of this activity was, as Parsons has argued, to influence the agenda of government, 'the framework within which political argument and policy discussion

³⁸ Keynes, General Theory, op.cit., Preface, p. v.

³⁹ Ibid., p. vi.

⁴⁰ Keynes, p. 427, 'Reconstruction in Europe: An Introduction', op.cit.

took place'.⁴¹ Keynes argued in 1926 that there must be an open-minded debate about the limits of government intervention:

Perhaps the chief tasks of economists at this hour is to distinguish afresh the Agenda of government from the Non-Agenda; and the companion task of Politics is to devise forms of Government within a Democracy which should be capable of accomplishing the Agenda.

However, I want to argue that there was a third stage in Keynes' strategy for influencing policy. Once the new atmosphere had been created, new institutional mechanisms needed to be set up to involve economists (all now ideally working within the new general theory) in the framing of economic policy. This would ensure that the full influence of economic expertise was brought to policy problems. Thus, once the intellectual agenda for the feasible scope of government intervention in the economy had been sufficiently broadened, Keynes supported calls for the establishment of an Economic General Staff. This body would help the politicians to accomplish the agenda which the economists had set.

Beveridge had put the case for an Economic General staff in two articles in the Nation and Athenaeum, in December 1923 and January 1924.⁴² Here he argued for an Economic General Staff, as a precursor to a putative standing economic committee along the lines of the Committee of Imperial Defence:

The time has come when the Government of this country should have a general intelligence division for economic problems - a staff of experts not engaged in administration and not attached to any one Department. This Economic General Staff would be expected and entitled to comment on the technical side of all important proposals raising economic questions that came forward from any of the departments. They would be expected on their own initiative to secure that the main economic problems of the day were being explored, and to submit, on their own initiative, or on the request of the Government, appreciations of the problems and alternative solutions for them.⁴³

The new body would have a Chief of Staff (whose description as 'a person of high authority in the science of economics, and of corresponding authority in the public service' sounds

⁴¹ Parsons, op.cit., p.379.

⁴² Sir W.H. Beveridge, 'An Economic General Staff', parts I and II, The Nation and Athenaeum, 29 December 1923, pp. 485-6; and 5 January 1924, pp. 509-10.

⁴³ Ibid., p. 509.

suspiciously like Beveridge himself!), and two or three 'responsible' experts, plus lay administrative staff. The body would call in outside experts for advice, 'in particular...[from] the economic departments of the Universities', to secure, 'several views...for consideration by the Government'.⁴⁴

Keynes was thinking along similar lines in 1925:

I believe that in the future the government will have to take on many duties which it has avoided in the past. For these purposes Ministers and Parliament will be unserviceable. Our task must be to decentralise and devolve wherever we can, and in particular to establish semi-independent corporations and organs of administration to which duties of government, new and old, will be entrusted - without, however, impairing the democratic principle or the ultimate sovereignty of Parliament. These questions will be as important and difficult in the future as the franchise and the relation of the two Houses have been in the past.⁴⁵

In 1926, replying to a leader in the Westminster Gazette about a recently published edition of his article 'The End of Laissez-Faire', Keynes put flesh on these bones and gave full support to Beveridge's scheme for an Economic General Staff:

In your leading article of 12 July...your contributor...argues that one of the most pressing tasks of the modern state is to remedy economic ignorance - inevitable ignorance due to the vastness and complexity of the modern world, and avoidable ignorance arising out of the aptitudes and inclinations of politicians. He therefore supports the appointment of a body on the lines of the Economic General Staff proposed some little time ago by Sir William Beveridge.

I am sure that this is right. A whole series of events here and elsewhere have proved that the modern statesman needs to be supplemented by something additional to and a little different from the Civil Service. We shall never enjoy prosperity again if we continue indefinitely without some deliberate machinery for mitigating the consequences of selecting our governors on account of their gifts for oratory and their power of detecting in good time which way the wind of uninstructed opinion is blowing. It is this need which I had in mind, amongst some other things, in the latter part of this sentence from my book: 'Perhaps the chief task of Economists of this hour is to distinguish afresh the Agenda of Government from the non-Agenda; and the companion task of Politics is to devise forms of Government within a Democracy which should be capable of accomplishing the Agenda'.⁴⁶

⁴⁴ *Ibid.*, pp. 509-10.

⁴⁵ Keynes, p. 301, 'Am I A Liberal', *op.cit.*

⁴⁶ Keynes, pp. 567-8, letter to the editor of the Westminster Gazette, 17 July 1926, CW XLX.

In 1929 Keynes was one of the participants in a series of meetings between government and civil servants, businessmen and economists, which ultimately led to the long-mooted formation of the Economic Advisory Council by the Labour Government of Ramsay MacDonald.⁴⁷ In response to requests, Keynes produced a memorandum on an 'Economic General Staff' in December. Keynes' scheme was strikingly similar to that of Beveridge. Its object was to obtain the services for policy-making,

...of individuals whose bent and desire is to devote their lives to scientific research, and to guiding from the centre the evolution of the economic structure, rather than to administration or to politics.⁴⁸

Keynes argued here that the establishment of such a body, from the 'nucleus, and...model' of the Committee of Civil Research would be:

...an act of statesmanship, the importance of which cannot easily be exaggerated. For it would mark a transition in our conceptions of the functions and purposes of the state, and a first measure towards the deliberate and purposive guidance of the evolution of our economic life. It would be a recognition of the enormous part to be played in this by the scientific spirit as distinct from the sterility of the purely party attitude, which is never more out of place than in relation to complex matters of fact and interpretation involving technical difficulty. It would mean the beginning of ways of doing and thinking about political problems which are probably necessary for the efficient working of modern democracy. For it would be an essay in the art of combining representative institutions and the voice of public opinion with the utilisation by Governments of the best technical advice in spheres, where such advice can never, and should not, have the last word or the power, but must be a necessary ingredient in the decisions of those who have been entrusted by the country with the last word and with the power.⁴⁹

While the Staff was to be made up of civil servants (though ones with a scientific economic training) there was also to be a further means of securing scientific economic advice attached to it. Keynes further suggested that:

⁴⁷ For the pre-history of the EAC (which is the history of the Committee of Civil Research, out of which it developed), see Roy MacLeod and E. Kay Andrews, 'The Committee of Civil Research: Scientific Advice for Economic Development, 1925-1930', *Minerva*, Vol. 7, (1968-9), pp. 680-705; and Anthea Bennett, 'Advising the Cabinet - the Committee of Civil Research and the Economic Advisory Council', *Public Administration*, Vol. 56, (1978), pp. 51-71. On the EAC, see Susan Howson and Donald Winch, *The Economic Advisory Council, 1930-1939*, (Cambridge, CUP, 1977).

⁴⁸ Keynes, p. 26, Memorandum on an 'Economic General Staff', 10 December 1929, pp.22-7, CW XX.

⁴⁹ *Ibid.*, p.27.

In addition to temporary *ad hoc* committees, there should be a permanent panel or scientific committee of economists and others [he no doubt had in mind here businessmen], for which the Staff would act as secretariat, which would be expected to give, confidentially, impartial outside advice and assistance on any questions which the Government of the day may wish to submit to it.⁵⁰

7.3 CONCLUSION

Keynes produced a new form of ethical public science in economics, in which the economist's claim to policy influence rested on both his scientific expertise and his ethical intentions. The economist was useful and good, and, in the final analysis, useful because he was good. This new publicly expressed rationale was rooted in elitist Moorean morality and aesthetics. The political medium through which this was expressed was Liberalism, but a re-forged Liberalism. Like Well's Clissold, Keynes believed that 'political Liberalism must die "to be born again with firmer features and a clearer will"'.⁵¹ Keynes held that:

The transition from economic anarchy to a regime which deliberately aims at controlling and directing economic forces in the interests of social justice and social stability, will present enormous difficulties both technical and political. I suggest, nevertheless, that the true destiny of New Liberalism is to seek their solution.⁵²

This New Liberalism would produce a new moral agenda, to be effected by a new political agenda with new bodies to carry it out. But, mindful of the failures of Soviet Communism, Keynes stressed that new solutions must come, 'not from political agitation or premature experiments, but from thought'.⁵³

In this gradualist approach, Keynes reflected the position of the Reformist scientists. He wanted to work to reform the existing democratic capitalist society and institutions from within, rather than to overthrow them violently. For Keynes, this latter course would have been to follow one's 'sympathy' without using one's 'judgement'. Thought had to precede and guide action. The mechanism for producing the new agenda would be an elite of

⁵⁰ *Ibid.*, p. 24.

⁵¹ Keynes, p. 319, '...Clissold', *op.cit.*

⁵² Keynes, p. 305, 'Am I a Liberal', *op.cit.*

⁵³ Keynes, p. 294, 'The End of Laissez-Faire', *op.cit.*

economists, whose role in policy was to be formalised in a new Economic General Staff reporting directly to the Prime Minister and the Cabinet.⁵⁴ This new elite would begin the changes towards Utopia; would translate value into fact.

⁵⁴ See Keynes, p. 25. 'An Economic General Staff', 'Section II: the Status and Organisation of the Staff', CW XX.

CONCLUSION

This study has shown that scientists and economists both produced distinctive rhetorics for the consumption of politicians, civil servants and the wider British public that aimed to secure meaningful influence for these expert groups over central government policy-making. Though differing in form because of the extent to which the leaders of these groups perceived their discipline to have become professionalised, these rhetorics shared a common aim: the formalisation of the expert's role in framing policy.

The natural scientists, who had put methodological disputes largely behind them and publicly constituted a cohesive group united by a commonly proclaimed scientific method,¹ had reached an advanced stage of professionalisation by around 1880. The various branches of science were well represented at the universities, forming a highly visible professional power-base. Furthermore science could boast a variety of national and international learned journals. There were also a plethora of learned societies, together with respected national umbrella groups like the Royal Society and the British Association for the Advancement of Science. Scientists had achieved cultural and social authority by being seen to win the struggle with religion over the Darwinian controversy. In fact the idea of a battle between science and religion had been largely manufactured by public scientists like Huxley and Tyndall, so that science could be presented as the victorious champion of all things progressive and modern; central to this process was the contrast between the irrationality of religious dogma and the rationality of scientific method.² As we have seen, in the years after 1880 a growing number of leading scientists had begun to argue that the scientific method, now accepted as having a social and cultural authority, was fully

¹ See Richard Yeo, 'Scientific Method and the Rhetoric of Science in Britain, 1830-1917', in The Politics and Rhetoric of Scientific Method (Historical Studies), Yeo and J.A. Schuster (eds.), (Dordrecht, Reidel, 1986), pp. 259-97.

² See F.M. Turner, 'Rainfall, Plagues, and the Prince of Wales: a Chapter in the Conflict of Religion and Science', Journal of British Studies, Vol. 13, (1973-4), pp. 46-65; 'The Victorian Conflict between Science and Religion: a Professional Dimension', Isis, Vol. 69, (1978), pp. 356-376; and 'Public Science in Britain, 1880-1919', Isis, Vol. 71 (1980), pp. 589-608. See also his Between Science and Religion: the Reaction to Scientific Naturalism in Late Victorian England, (New Haven, Yale University Press, 1974).

translatable into all areas of national policy. Pressure was exerted on the existing national umbrella organisations to take a lead as the authoritative voice of science in national questions, and when these groups proved reluctant, a new national (though initially London based) organisation was formed (the British Science Guild) specifically to argue for more technocratic government.

Influence over policy-making presented itself as the natural next step for an ambitious professionalising group, particularly as the activities of the State were now increasingly expanding into areas (like industrial regulation, public health and the like) of scientific expertise. Furthermore, science had become more expensive as it progressed, and its practitioners naturally increasingly looked to the resources of the State for financial support. To assert that if the State was to control science, scientists had better control the State is not the whole story, but is part of it. Scientists viewed the State as antithetical to the aims and methods of science. Politicians were largely generalists, as was the post Northcote-Trevelyan Civil Service.³ Moreover, as Roy MacLeod has suggested, the authority of those individual scientists who were already inside the government machine was being progressively squeezed by civil servants from about 1870.⁴ A further influencing factor was the ongoing debate about national efficiency of the Edwardian years. Scientists were heavily influenced by such concerns, with their explicit criticisms of traditional party government, but they also viewed the debate as an opportunity to create and publicise an argument for government by scientists.⁵ Scientists were to have executive authority via the constitutional innovation of a national scientific council which government departments would be obliged to consult, and whose recommendations would become policy.

In arguing thus, I have expanded the pioneering work of Frank Turner.⁶ He discerned that there were three distinct historically and ideologically specific rhetorics of science during the nineteenth century, and first suggested that in the third period

³ See Peter Gowan, 'The Origins of the Administrative Elite'. New Left Review, No. 162. (1987), pp.4-34.

⁴ See Roy MacLeod, 'Introduction' to Government and Expertise... . op.cit.

⁵ See G.R. Searle, The Quest for National Efficiency A Study in British Politics. (Oxford, Basil Blackwell, 1971). especially pp. 83-4.

⁶ F.M Turner, 'Public Science...', op.cit.

(from c.1875) scientists began to seek political power. However, Turner only posited that scientists wanted 'power or influence in the civic arena'.⁷ Working from a detailed analysis of the rhetoric, I have shown that the scientists, specifically and self-consciously, wanted power to make policy, via a new national scientific council.

As well as deepening Turner's analysis, I have extended its chronological span and looked in some detail at public science arguments during, and after, the First World War. The war seemed to fulfil all the scientists' prophecies about the dire consequences to the nation of a neglect of science, and to reinforce their arguments for scientific government, which they thus reasserted with a renewed vigour. The war provided scientists with many new opportunities for government service and, as we note, particularly in the case of the Food (War) Committee of the Royal Society, these were used as platforms from which to underline the need for a formalisation of scientific advice which would carry over into the coming peace. But these new opportunities for influence also exposed tensions and divisions within the scientific community as to the most effective means of organising State scientific research.

Though more work needs to be undertaken in this area, I would tentatively suggest that elements within the Royal Society consistently blocked pressure for the Society to become officially recognised as the formal central organising body in British science. It seems that the Council wished to preserve the traditional distance between the Society and government. I would argue that this position was adopted not only to preserve the objectivity of science, as was often publicly claimed, but also because of a belief that a network of close but informal connections between the Society and government would be more productive, in terms of policy influence, than formal connections. I would further suggest that this may have reflected a greater degree of political awareness on the part of elements of the Society, than those scientists who pressed it to take more of the centre stage. Elements within the Society may have discerned that the path of new State bodies to organise science (controlled as much as possible by eminent scientists, though ultimately under the control of non-scientific

⁷ Ibid., p. 592.

bureaucrats and politicians) with strengthened informal linkages was all that was possible without alienating politicians and civil servants steeped in a State culture which wished to preserve the art of policy-making as the special preserve of generalists like themselves. The State was willing to see the expert on tap but not on top. Thus the Society supported a model for the organisation of British science which centred on the DSIR and the various research councils. The Society retained control over the selection of the key top personnel in these new bodies, although they remained, nominally at least, government bodies. Research agendas and their co-ordination behind-the-scenes were, however, in the control of the Society through its eminent fellows, who either headed or were on the scientific advisory committees of all the new bodies. Thus the access of scientists to government at the highest level was taken to a new plane without antagonising the State. This Royal Society model for the organisation of science and advice became enshrined in the new relations between government and science, as was underlined by its incorporation in Haldane's key report on the machinery of government in 1918.

The public science activities of the Food (War) Committee demonstrated aspects of the Royal Society model in action. Hardy and the other leading members pressed for a formalisation of the policy-making status of the committee as far as was possible. But, realising the ambiguous status of outside expert advice, and the primacy of other political priorities, the committee at the same time attempted to increase its influence by utilising a range of informal channels of access to the Government. In fact the only way found to continue the work of the committee into the post-war period was through Hardy acting as a key individual at the Food Investigation Board, set up under the DSIR.

However, in spite of such large gains, the immediate post-war years were problematical for public scientists. Firstly the implications of the Royal Society model had to be addressed. New State bodies controlling science was fine as long as those bodies were themselves controlled by eminent scientists linked to the Royal Society or other branches of the scientific establishment. However, this model also presented the possibility that the State could come to control science through non-scientific chiefs of

the new bodies. Thus public science was dominated by the need to control research by scientists. Other wartime legacies dictated the remainder of the public science agenda in the 'twenties. The public image of science itself as politically neutral and beneficent had become tarnished by association with the development of ever more deadly weapons technology, and especially poison gas. The other legacy was of a new solidarity, particularly among less eminent scientific workers. This resulted in new professional and trades union bodies being formed to protect the new status, pay and prospects of scientists. Partly this was a reaction against the control of science by the scientific elite, as embodied in the Royal Society model. Partly, like the rehabilitation of science's public image, and the control of research, it was a way of shoring up science's wartime gains. This was felt by public scientists to be a crucial precursor to any further policy influence.

While the majority of public scientists united in a public relations campaign to represent science as largely civilian and the key to peaceful economic prosperity, to increase professional status, and to control research, the war had brought out a fundamental ideological split within the public science community, which had profound implications for its political goals. For the first time, left-wing public scientists began to obtain access to the major organ of the scientific community (Nature) and to create their own platforms (the NUSW and its organ the Scientific Worker). These scientists (like Hyman Levy and Frederick Soddy) shared the view of the pre-war broadly Liberal/Social Imperialist majority of public scientists that scientists should have power over policy, but argued that this could only come through a reorganisation of society along socialist lines. Their view was that the war had so fatally wounded the public image of science, because science had been the willing ally of an essentially morally corrupt and wasteful capitalist society. In order to reconstruct science, and to ensure it had its proper say in the counsels of the nation, society itself had to be reconstructed on scientific (which to them meant) socialist lines.

This view continued to be expressed only by a minority of public scientists in the 1920s, partly because of the unpopularity of socialism after the revolution in Russia, as well as the troubled labour situation at home. The majority of public

scientists stuck to the more moderate Liberal/Social Imperialist position of the Edwardian era. They wanted power within the existing social organisation, and thought this best achieved by promoting science as essentially liberal and the handmaid of the peaceful reconstruction of a economically successful and socially stable Edwardian model of the nation. These two positions became increasingly polarised during the 1930s, the socialist element becoming increasingly vocal.

Gary Werskey⁸ has aptly labelled these factions as 'Radical' and 'Reformist' in the 1930s, and the importance of my analysis is that it links the work of Turner and Werskey. I argue that the period c. 1917-1925 constitutes a new transitional phase of public science: in Turner's terminology, a new period. It was a time when the social-imperialist vision of the kind of society science should empower, and have power in, first came under challenge, albeit in a muted form, from a socialist alternative. As in other periods or phases, the rhetoric was sensitive to contemporary concerns. The bulk of the public science community now stressed science as essentially civil, but the more radical elements were able - in a climate of public opinion broadly hostile to, or at least wary of, science - to press their analysis of the problems of achieving scientific government further. Informed by a socialist political agenda, they pinpointed the existing social and political organisation as the root of the problem. So this period was transitional between the common context of public science in the Edwardian and early wartime period and that of the 1930s. The rhetoric of public science was beginning to change again with changing contemporary social concerns, as Turner demonstrated it had changed throughout the nineteenth century, and as I noted that it responded to the special circumstances of both the Edwardian and wartime periods.

The analysis of my companion group of academic experts, the economists, yielded a rather different, though comparable, pattern of the emergence of a strategy for policy influence. I have demonstrated that what came to be the dominant Marshallian strand in British economics felt that economics was not in the same enviable position of social and cultural authority as the natural sciences in the 1880s.

⁸ See all of Werskey's publications as listed in my Bibliography, but most crucially his 'British Scientists and "Outsider" Politics, 1931-45', op.cit.

Economics was still riven by a long-standing methodological dispute between theoreticians and empirical historicists. Marshall's view was that before political influence could be achieved, economics had to be at least presented successfully as a unified science, with all that implied. This was, I suggest, one of the chief motivations behind Alfred Marshall's campaign to professionalise economics in Britain. Marshall was playing the long game. Economics had to be re-presented to the public (including politicians and civil servants) as a united discipline with universal scientific applicability for its generally agreed laws. In following such a strategy for long term policy influence, Marshall was openly following what he perceived to be the professional trajectory of science. In order for scientific method to be transferable to policy problems, Marshall had to create the image of a scientific economics in the public mind. This was a long term goal, as it entailed not only a national association with learned journal, a curriculum and tripos at Cambridge for replication elsewhere, but also the standardisation of what Maloney has called a 'research programme' around welfare economics. Marshall wanted ultimately to create a definition of economic theory within which all members of the economic community could comfortably work.

While this entire edifice was being built up, Marshall viewed open attempts to influence policy-making as ill-timed and counterproductive, as they ran the risk of exposing fundamental differences of emphasis within the economic community. Thus, for the short term, Marshall standardised a negative form of public science, which involved actively distancing economics from politics, and renouncing any desire to influence policy. However, this was only part of a longer term strategy for policy influence once all the elements were in place. Privately, even in the short term, Marshall attempted, via *ad hoc* and informal contacts with sections of government, to influence policy during this formative period for economics.

This public version of the professional economist as detached scientist did not go unchallenged, however. An alternative version, rooted in an adherence to a different, more inductive/empirical methodology in economics, and thus a different view of the discipline's nature, scope and social purpose, was put forward by the

historicists. My example here was the rhetoric and activities of W. J. Ashley. He propounded a more positive public science for the short as well as long term, which was akin to that of the scientists. He believed that the economist should define himself and justify his social use (or create his expertise) not by cloaking himself in the mantle of scientific method, but by his real experience of social, and industrial problems. On this latter basis, Ashley argued for a formalisation of the role of the economist in policy-making, and took every opportunity whilst in government service during the war to press for this. Ashley's public science, though similar in its goals to that of the natural scientists, was based on experience and interpretation of economic behaviour, rather than theory and scientific method.

While, again this is an area in which further research is needed, I would tentatively suggest that, in spite of the general involvement of both historicists and Marshallian theoreticians in government service during the war, it was the Marshallian position of preserving a public distance from policy pronouncements which remained dominant even into the 1920s. I have however suggested that there was at least one exception to this general line: Maynard Keynes. During the late war and the 1920s he argued vociferously and very publicly for certain lines of economic policy to be pursued, and, in general, that economists should play a more formalised part in the policy-making process. I have argued that Keynes's positive, ethical public science should be seen squarely in the context of the earlier Marshallian developments. Keynes worked within the tradition of Marshall's professional synthesis in two ways. Firstly he was able to operate as an economist with the knowledge that this was now a recognised profession with a certain social and cultural authority (and for this he had Marshall to thank, and did so). Keynes behaved exactly as Marshall had envisaged economists behaving, once the reputation and status of economics had been firmly established. In this sense Keynes was true to Marshall's vision, though the Marshallians (like Pigou), who perhaps did not fully understand that part of Marshall which dealt with long term influence, did not agree. Secondly, Keynes himself attempted, like Marshall, to create a new paradigm within which all economists could work with his General Theory. Further work needs to be done on economists to

establish if Keynes was simply a maverick, and how the public science of economics developed through the late 'twenties and beyond. Was there, for instance, a group of socialist economists producing a rhetoric similar to the scientific Radicals ?; and was there a group of Reformists, which adhered to the Marshallian line and simultaneously pursued informal channels of influence, while involving itself in the emerging new channels of economic advice to the government, like the Committee of Civil Research and the Economic Advisory Council?

The importance of these analyses is two-fold. Firstly they add to the body of literature arguing the essentially social nature of 'scientific' activity. This mode of analysis, is well-established in the history of the natural, medical and human sciences, though not in this area. In the history of economic thought, this mode of analysis is in its infancy, and there is much scope for further work, as Margaret Schabas has recently argued.⁹ Secondly, some understanding of the existence and importance of the kind of rhetoric I have demonstrated, is, I would argue, an essential precursor to studies whose aim is to establish, empirically, the degree of influence which experts had on government policy. This is best illustrated in the case of natural science. Just as most accounts of the history of the relations of science and the State argue for a continuing State niggardliness and reluctance to support scientific work financially, based on the special pleadings of the scientific community itself, so the real degree of influence may be masked by the scientists' unrealistic ambitions for power, and a consequent underplaying of their true influence, which undoubtedly increased during the period under consideration. Similarly with economics, the argument that the British State has been consistently backward in developing formal institutions for economic advice and the input of expert economists into policy, while economists themselves have been reluctant to commit themselves publicly on policy issues, may entirely miss the point. An analysis of the public science of economics shows that it is important to know exactly what it was that economists wanted, and how they set about achieving it, before any attempt is made to evaluate their influence. It is a

⁹ M. Schabas, 'Breaking Away: History of Economics as History of Science' and the various 'Comments' making up the 'Minisymposium', History of Political Economy, Vol.24, No.1, Spring 1992, pp.185-247.

question of recognising the rhetoric as such, and not taking it as undisputed historical fact. This may well have implications for the debate about how much, and what kind of expert advice the British State received, and how it received it. This in turn has a crucial bearing on the whole debate about the economic and scientific 'decline' of Britain. The State cannot be said to have been anti-scientific, though it was anti-technocratic, preferring not to give experts any formalised role at the heart of the policy-making process. Experts groups which grasped the nature of this State culture pushed their claims for policy influence forward on two simultaneous fronts. While pressing for the formalisation of contacts with the State (either in the short or long term), they also maintained a network of informal contacts through which advice was independently given by the experts and also sought by the State. Thus the British State has historically tended to get its scientific/economic expert advice in a much less visible form perhaps than other States (and I am thinking here of both Germany and America). But this is not the same as saying that there was very little expert input into policy-making.

In any study of this kind, there will be questions which are necessarily neglected. The most obvious of these I have just touched on: the question of international comparisons. Certainly related developments may have been taking place in Germany, America, Russia and Japan, and it would be particularly interesting to analyse the situation in these nations which were contemporarily perceived as potential economic and military threats to Britain. But there are many other areas which this analysis highlights as worthy of further investigation. For instance, which other groups in society were expressing similar arguments about political ambitions? It would be particularly interesting to extend this kind of analysis of public science more thoroughly into the medical and engineering communities. I have also noted in passing at various points in the thesis that a form of public science was being produced by (or on behalf) of businessmen and business methods. This non-academic group seemed to have presented itself, and to have been presented, as possessing a peculiar form of natural expertise. What is interesting is that such points about the applicability of business methods to policy were expressed in the language of public science. If this

form of natural knowledge was seen as an antidote to an increasingly professionalised society run by experts, how interesting that the idea of the expert and his authority should have permeated so deeply that even pro-business rhetoric utilised it (perhaps unconsciously). Another avenue would be to extend the concept of public science itself, as I have done to some extent, to take in the range of public relations activities engaged in by scientists. What bearing for example do exhibitions, public lectures and demonstrations, pamphlets, newspapers articles (particularly if part of a series), radio and cinema broadcasts and other communications media have on the campaign for influence over policy? Turning to specific areas, more work needs to be done to elucidate fully the role of the Royal Society (including all of its neglected wartime committees) in the First World War, and further work could also usefully be done on a broader range of economists than I have been able to study here, to see if the positions I have identified hold, as I believe they do. Finally, we need to know the patterns of public science during the years following the period covered by this thesis, perhaps right up to the present day.

The concept of public science, then, can, and hopefully will, be developed as a useful tool of historical analysis. This thesis seeks to be a first contribution to what will, I trust, be an ongoing debate and area of research in social and political history.

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