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Scientists, Statesmen and War: The Case of the Scientific Advisory Committee.

The now extensive historiography of the Second World War confirms with fascinating certainty that twentieth-century total technological warfare forced developed nation states to marry their statesmen to their scientists. While the long-term marriage itself proved a near cataclysmic affair, the wedding too had many moments of turbulence. This article examines one particular event in twentieth-century British history of scientific and technological institutionalisation. Piecing together previously unconnected primary evidence, this article re-interprets the uneasy beginnings of the Scientific Advisory Committee (SAC) to the War Cabinet established in October 1940. This article further demonstrates that even in an emergency so immense as modern war, science and politics continued to remain as awkward bedfellows.

It was during the First World War that the British Government began to appreciate the value of a permanent civil partnership developing between scientists and the state. From the high pinnacles of David Lloyd George's 'Garden Suburbs' – ideas men attached to the Cabinet – down to the nitty-gritty of keeping common men alive through the work of the Medical Research Committee, science began to permeate the Whitehall corridors of power in an unprecedented fashion essentially as a consequence of total war.² This scientific incursion was

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² For the 'Garden Suburb' see John Turner, 'Cabinet Committees and Secretariats: the higher direction of war', in Kathleen Burk (ed.), *The War and the State* (London: Allen & Unwin, 1982). For the Medical Research Committee (MRC) see The National Archives (hereafter TNA) files FD 1/9151 (for financial arrangements and inception); FD 5/3 (for MRC's work in France 1914-18); FD 5/73 for general MRC wartime correspondence; see Philip Gummett, *Scientists in Whitehall* (Manchester: MUP, 1980), pp. 24-25 for a succinct general narrative of the formation of the MRC.

curbed after the Great War as *laissez-faire* liberalism dictated, but nonetheless lessons had been learnt. Thus when war clouds were brewing once more in 1937/1938 a compilation of reserved occupations was made to avoid making the same mistake as before in allowing scientific men to fight and die on the frontlines. In addition, a central register of volunteers for war service with technical and professional qualifications was established with the aid of the Royal Society and the universities.³

However, the question remained as to whether this science/state activity was sufficient, particularly in light of the fearful dangers that yet another total war could deliver. On this occasion it was the eminent Fellows of the Royal Society who were to ‘champion’ science; as had been their mandate for almost three centuries. It is important to note at this juncture that at that time the Royal Society was mostly led by scientific men who were veterans of the Great War science/state partnership; Sir William Bragg FRS was President, A.V. Hill FRS was Biological Secretary, A.C.G. Egerton FRS was Physical Secretary, while Sir Henry Tizard FRS was soon to become Foreign Secretary of the Royal Society, and Sir Henry Dale FRS was to replace Bragg as President.⁴ All of these scientists would play their own part in the creation and organisation of the controversial science/state body this article shall discuss.

The creation of the Scientific Advisory Committee (SAC) to the War Cabinet in 1940 has been written about.⁵ Only one writer, however, has ever referred to the papers of the wartime

³ Guy Hartcup, *The Challenge of War, Scientific and Engineering Contributions to World War Two* (Newton Abbot: David and Charles, 1970), pp. 22-23.

⁴ Sir William Bragg (then Professor Bragg) had been on the Admiralty Board of Invention and Research, while his son Lawrence had instigated some superb ‘operational research’ in artillery sound-ranging on the western front; A.V. Hill had also been a pioneer of ‘operational research’ with the Anti-Aircraft Experimental Section; Sir Henry Dale had been heavily involved in Great War medical advancements, and had introduced a drug for treating amoebic dysentery; Sir Henry Tizard had been a pilot in the RFC, and ended the war as a Director of the Martlesham Experimental Station. Only A.C.G. Egerton had no direct scientific influence on British state war machinery during the Great War, although his significant contribution followed shortly after during the interwar period.

⁵ See William McGucken, ‘The Royal Society and the Genesis of the Scientific Advisory Committee to Britain’s War Cabinet, 1939-40’, *Notes and Records of the Royal Society of London* 33 (1978), 87-115; see also Ronald W. Clark, *Tizard*

Biological Secretary of the Royal Society – Archibald Vivian Hill – who was the staunch protagonist of a full scientific presence within the heart of Government. In 1978 William McGucken wrote that the initiation of the SAC was the result of political expediency and that its success lay primarily in its survival.⁶ This though remained the extent of his interpretation. Recently David Edgerton commented further that the SAC was a sop and chose not to go into detail as to why.⁷ Thus, in such cases of unexplained interpretation, it is worth reinvestigating evidence (which in the case of the SAC has not been reviewed for thirty-three years) to determine the historical truth.

Before proceeding, however, it is important to consider the two distinct veins of thought which have emerged relative to the sparse historiography of the SAC. The first is that this scientific/political organisation can perhaps be seen as a benchmark for the extent of governmental intervention into the ever-burgeoning scientific and technological sphere. That this intervention only occurred during wartime, some thought, demonstrated the previously-mentioned *laissez-faire* liberalism of early-to-mid-twentieth century British politics, and the very fact that it happened at all emphasised the emergency of war. As a general rule, politicians did not really understand the latent power of science and technology, while scientists and technicians preferred not to meddle in politics. Yet following this interpretation through to some degree of logical conclusion, Marwick suggested that this only tampered with the continually-emerging problems which involved the relationship between state and science. For Marwick, the SAC (and other such science-politico bodies) placed unprecedented focus on the need for changes to the

(London: Methuen & Co. Ltd., 1965), pp. 274-275 and *The Rise of the Boffins* (London: Phoenix House, 1962), pp. 159-165; see also Gummert, *Scientists in Whitehall*, pp. 29-31.

⁶ McGucken, 'The Royal Society and the Genesis of the Scientific Advisory Committee', 87.

⁷ David Edgerton, *Warfare State: Britain, 1920-1970* (Cambridge: CUP, 2006), p. 165; this statement abbreviated Hilary and Steven Rose's version of 'slightly soggy sop' in their *Science and Society* (London: Pelican Books, 1975), p. 70.

British educational system in order to create politically-minded scientists and scientifically-minded politicians – or better still, an educational system which recognised no such apartheid.⁸

On the other hand, the involvement of scientists within the highest echelons of politics has been seen by some as interference, rather than necessary societal and wartime intervention. Philip Gummett wrote that ‘after the unprecedented political activity of at least some of their number during the ‘30s, it would have been surprising if scientists had not tried to gain access to the highest counsels of war’.⁹ More recently, and in the same vein, David Edgerton has stated that academic scientists ‘wanted a higher-level sort of “scientific general staff” to advise on and co-ordinate all the warlike and development effort’; and that the Royal Society had been ‘agitating’ from the late 1930s for a services research council to be attached to the new Ministry for the Co-ordination of Defence.¹⁰ Not surprisingly these proposals were strongly resisted by already-established research organisations attached to the Royal Navy and the RAF. It is important to consider here Edgerton’s preferred use of the verb ‘agitate’ in expressing the determination of the Royal Society Fellows to be consulted in state scientific matters at a time of such urgency. The evidence suggests that while ‘agitation’ is not an overly strong definition – for their advances were indeed determined – it nonetheless slightly misleadingly implies that the generous offer by the eminent Fellows of the Royal Society was not as unconditional as it may have originally appeared. This matter thus requires more detailed historical examination.

As a wartime document confirmed, science in Britain had grown through four main agencies; the universities, scientific societies, industry and government. The development had been roughly in

⁸ Arthur Marwick, *Britain in the Century of Total War: War, Peace and Social Change 1900-1967* (London: Pelican Books, 1970), p. 288.

⁹ Gummett, *Scientists in Whitehall*, p. 29.

¹⁰ Edgerton, *Warfare State*, p. 165; for documentation relating to this Royal Society ‘agitation’ see TNA CAB 21/711. Enclosed in this file is a particularly prescient memorandum (among many others) by Sir Henry Tizard entitled ‘Scientific Advice on Problems of War’. It is also worth noting that this correspondence between the Royal Society and Government ministers dates back to April 1938.

that order in time. Since the Great War, rapid scientific expansion due to the latter agency had led to twenty-six government departments participating in scientific activities.¹¹ However, in the pre-war nervy atmosphere during the summer of 1939 the scientists of the Royal Society became alarmed at the departmentalism of science within the service of the state. They saw a situation in which scientific departments were becoming ever more isolated from each other and from the ‘main stream of independent scientific thought and discovery’.¹² These scientists deemed it their duty to offer, through the Royal Society, full access to the Government to the wider scientific sphere, in the form of a small group of representatives of the various branches of science. This group would be formed from the leading members of the Royal Society, who were naturally in close touch with the main body of its Fellows.

The first approach to the Government was a letter written by the President of the Royal Society, Sir William H. Bragg to Lord Chatfield, Admiral of the Fleet and Minister of Co-ordination of Defence. After detailing a proposal, Bragg concluded the letter stating that the Royal Society would be proud to extend its ‘traditional role of co-operation with the Government’.¹³ Chatfield forwarded this proposal to all the service ministers and to the Minister of Supply.¹⁴ No action was taken, so five days after the declaration of war with Germany, Bragg wrote again to Chatfield

¹¹ Royal Society Archives (hereafter RSA), Henry Dale Papers HD/8/8/2/14/29, ‘Science in Britain I’ written by J.G. Crowther for The British Council, undated but certainly written in late 1942. We could also consider here that the National Physical Laboratory (NPL) – the first true example of British state involvement in scientific research matters – was established in 1900 following sustained pressure from the Royal Society and the British Association for the Advancement of Science. The Treasury requested that the Royal Society accept responsibility of the NPL which they did, yet after the war the NPL reverted back to government ownership under the responsibility of the Department of Scientific and Industrial Research (DSIR). For more on this see Russell Moseley, ‘Government Science and the Royal Society: The Control of the National Physics Laboratory in the Interwar Years’, *Notes and Records of the Royal Society of London* 35 (1980), 167-193; see also Sir Harry Melville, *The Department of Scientific and Industrial Research* (London: George Allen and Unwin Ltd., 1962), pp. 19 & 30; see also Eric Hutchinson, ‘Scientists and Civil Servants: The Struggle over the National Physical Laboratory in 1918’, *Minerva* 7 (1969), 373-398.

¹² TNA CAB 21/711, ‘Note Dictated for Purposes of Record’ by E.E. Bridges for the Lord President of the Council, 6 July 1939; also TNA CAB 21/712, Sir William H. Bragg to Lord Chatfield, 13 July 1939. The file TNA CAB 21/711 has much 1938/39 correspondence between Tizard and Government Ministers relating to the possible creation of a Central Scientific Advisory Committee. It is clear from this documentation that the SAC was originally Tizard’s brainchild. However, a letter from Egerton to Bridges dated 14 June 1939 states that Hill’s proposal was ‘wider in scope and purpose’ than that Tizard had been suggesting. Thus Bragg’s letter can be seen as the first official Royal Society approach to Government in this matter.

¹³ TNA CAB 21/712, Bragg to Chatfield, 13 July 1939.

¹⁴ TNA CAB 21/712, Chatfield to Earl Stanhope, Admiralty; Chatfield to Sir Kingsley Wood, Air Ministry; Chatfield to Leslie Hore-Belisha, War Office; Leslie Burgin, Ministry of Supply, all letters dated 19 July 1939.

to further press the urgency of the Royal Society proposal.¹⁵ In the meantime Bragg amended the proposal to make it less complicated and thus more appealing. Chatfield promptly sent this to the same ministers, commenting that the new proposal avoided the objections made to the previous plan; the difference this time, of course, being that the Admiralty was now headed by Winston Churchill.¹⁶

On this second time of asking, Churchill and Leslie Burgin replied. The latter agreed that it was ‘impossible to resist the proposal’ so long as it was ‘requisite to the War Cabinet’ and ‘in no way inconsistent with the development of the research departments’.¹⁷ Churchill’s reply however was completely the opposite. Churchill deemed the research departments were sufficiently in touch to render such liaison unnecessary and would not require assistance finding scientists to help them should they be in difficulty; that newcomers would be viewed as a waste of time as well as a risk to security. Therefore, Churchill stated that the suggestion was ‘unnecessary, and should be dropped’.¹⁸ Considering Churchill’s highly-enthusiastic involvement in science during the Great War this rejection must have come as rather a shock. Nonetheless, the matter was indeed dropped – for the time being at least.

There can be no doubt that the Second World War was a period of remarkable scientific discovery. One historian who heavily focused on the twentieth century war/science relationship stated of the Second World War that it ‘formed a watershed in the progress and organisation of science’.¹⁹ While this cannot be disputed, it is important to counter-balance this argument with the fact that this scientific progress and organisation flowing upstream stopped at one man – Churchill’s friend and confidant – Professor Frederick Alexander Lindemann. History has had a

¹⁵ TNA CAB 21/712, Bragg to Chatfield, 8 September 1939.

¹⁶ TNA CAB 21/712, Chatfield to Winston Churchill, Wood, Hore-Belisha, Burgin, all dated 26 September 1939.

¹⁷ TNA CAB 21/712, Burgin to Chatfield, 28 September 1939.

¹⁸ TNA CAB 21/712, Churchill to Chatfield, 28 September 1939.

¹⁹ Hartcup, *Challenge of War*, p. 17.

great deal to tell of Lindemann for, after meeting Churchill socially in 1921, the two men became politically inseparable. Churchill may well have believed he was ‘walking with destiny’, but in many ways and in many things, his ‘scientific guru’ was there by his side to help him, guide him and above all advise him.²⁰ The ‘Prof’, as he was endearingly known, saw Churchill as his ‘master’, one to whom Lindemann demonstrated a deep feeling of devotion.²¹

Thus, when Churchill finally reached the pinnacle of power, Britain was governed by a politician and a scientist side-by-side. This may appear at first a rather extreme statement, but in almost all scientific policy during Churchill’s wartime premiership, the Prof’s seal of approval was evident. Moreover, as this article shall further demonstrate, Churchill and Lindemann’s special and unique arrangement stifled any possibility of a smooth integration of science and British politics. This is a fact which has been largely overlooked by historians. However, evidence exists that proves that the pleas by the Fellows of the Royal Society to be more involved in the scientific policy-making decisions of Government were sidelined to maintain Churchill’s preference for, and Lindemann’s position as, his sole scientific adviser.

Following disappointment after disappointment against the Germans in the war, by June 1940 the Royal Society again decided to act. It was agreed after much debate that the most appropriate method for a second approach was for Bragg to write directly to the new Prime Minister, Winston Churchill. After laying out the proposal for a scientific body to directly advise the Cabinet, Bragg wrote of the urgency of the situation; of the need for the ‘immediate utilisation of existing scientific knowledge’ for the ‘rapid solution of practical scientific problems’. Bragg ended the detailed three page letter hoping that it would be seen that the suggestions were with a

²⁰ For ‘scientific guru’ see John Charmley, *Churchill, The End of Glory* (London: Sceptre, 1993), p. 294.

²¹ William Farren and George P. Thomson, ‘Frederick Alexander Lindemann, Viscount Chervell. 1886-1957’, *Biographical Memoirs of the Fellows of the Royal Society* 4 (1958), 68.

‘view to ensuring that science is allowed to make its most effective contribution to the prosecution of the war’.²²

However, the expected urgency to the proposal was not forthcoming. Bragg did not receive an official reply until 8 July 1940, in which he was informed that after much consideration an interview may be arranged during which the matter may be discussed with the Prime Minister’s secretary.²³ This interview between scientists and statesmen took place on 10 July 1940, during which the latter asked for examples of cases in which the proposed committee would be of use to the Government. The Royal Society scientists took a further two weeks to prepare their answer. They were careful to be diplomatic, for they were wary that if they commented on particular cases they could well have been accusing individuals of neglect and inefficiency. Thus, in answer to the ‘very proper question’, they chose to be more general – ‘strategy rather than tactics’. In doing so and in promotion of the proposed committee, they presented phrases such as ‘provide authoritative opinion from the great body of scientists’; to ‘keep a watch on the way in which the nation’s scientific and technological organisation copes with the problems of the day’; and to ‘advise on what might be done towards improvement’ of the efficiency of the British scientific and technological organisation.²⁴ Sir Alan Barlow’s response to this was that he would do all he could to get a reply.²⁵ Bragg was not to receive this reply.

Two months later, with no further action having been taken, Archibald Vivian Hill, a well-connected member of the intellectual aristocracy (J.M. Keynes was his brother-in-law), and recipient of the 1922 Nobel Prize for Medicine, elected to take over where Bragg left off.²⁶ In 1933, Hill had been quoted in the scientific journal *Nature* saying that ‘if science is to continue to

²² TNA CAB 21/829, Bragg to Churchill, 10 June 1940.

²³ TNA CAB 21/829, Sir Alan Barlow to Bragg, 8 July 1940.

²⁴ TNA CAB 21/829, Bragg to Barlow, 24 July 1940.

²⁵ TNA CAB 21/829, Barlow to Bragg, 27 July 1940.

²⁶ See Gary Werskey, *The Visible College, A Collective Biography of British Scientists and Socialists in the 1930s* (London: Allen Lane, 1978), p. 154.

make progress, it must insist on keeping its traditional position of independence, it must refuse to meddle with, or to be dominated by, divinity, morals, politics or rhetoric'.²⁷ But war made it necessary for Hill to reverse this stance. Things had been wholly different in the 1930s. Led by the left-wing standard-bearers such as J.D. Bernal and Patrick Blackett, many scientists between the wars had developed an increased awareness of their social responsibility.²⁸ Moreover, owing to the ever-growing and unprecedented scientific activity within the political sphere, many scientists became fully aware by 1939 that neither politicians nor the forces behind them could, without scientific advice, realise or release the latent possibilities which twentieth century science had to offer. Thus, by 1940, and clearly as Bragg's struggle had proven, a special type of scientist was needed by the politician – a kind of hybrid scientist who knew enough of both the scientific and the political field to be able to establish the fusion of the two.²⁹

Such a man was A.V. Hill – a Cambridge-educated physiological scientist who from 1926 to 1951 was Foulerton Research Professor of the Royal Society, and rose to be Biological Secretary from 1936 to 1945 and Royal Society Foreign Secretary from 1945 to 1946. Just as importantly, Hill also became the independent Member of Parliament for Cambridge University from 1940 to 1945. Incidentally, he was to be one of the last ever University MPs, for the Attlee Government abolished university representation. Hill later commented that 'the Conservatives loudly protested that they would restore it later but nobody believed them and they never did'.³⁰

As an academic scientist and newly-elected MP, Hill joined the rather select few who have in history combined scientific and political activity within the House of Commons. In his election address of 27 February 1940, Hill declared that one of the chief reasons for University

²⁷ A.V. Hill, 'International Status and Obligations of Science', *Nature* 952 (1933), 132.

²⁸ Gummert, *Scientists in Whitehall*, p. 29; see especially Werskey, *The Visible College*.

²⁹ J.D. Bernal, *The Social Function of Science* (London: George Routledge & Sons Ltd, 1939), p. 402.

³⁰ A.V. Hill, 'Memories and Reflections' unpublished memoirs, Churchill College Archive Centre (hereafter abbreviated to CCAC), 920/HIL, p. 265.

representation in Parliament was to help bring science and learning to bear upon national affairs. He argued that science still had too little influence on higher Government policy and that if the war was not to cause depreciation both in material and spirit values, then the strength of the universities had to be maintained.³¹ Upon taking his seat in the National Government, and being necessarily contrary to his 1933 rhetoric of scientific autonomy, Hill deemed that authority was invested in him to propagate the matter of a centralised but non-government scientific elite to exert pressure on the political direction of the war.

At the height of the 1940 London blitz, Churchill wrote in a memo prepared for the War Cabinet that the best way to cope with the enemy's superior strength was by devising new weapons, and above all by scientific leadership.³² Although there is no firm evidence to confirm the link, it can be little coincidence that this call for scientific leadership came a few weeks after the anonymous publication of the 'tract of the times' entitled *Science in War*.³³ This famous Penguin book was written by 'twenty or so' members from the Tots and Quots group, which included scientists, economists, a sociologist and a couple of politicians.³⁴ In the publisher's note was an urgent call in such a desperate situation for the 'effective utilization of scientific thought, scientific advice and scientific personnel'. Moreover, it was claimed 'essential to break down the traditional resistance of administrators to a general scientific approach'.³⁵

³¹ See 'The Cambridge Election', *The Times*, 14 February 1940, p. 5; see also 'University of Cambridge Parliamentary By-election', *Nature* 145 (1940), 341; See also McGucken, 'The Royal Society and the Genesis of the Scientific Advisory Committee to Britain's War Cabinet, 1939-40', 103.

³² Winston S. Churchill, *The Second World War*, Vol. 2 (London: The Reprint Society, 1951), p. 369.

³³ See 'Men of Science and the War', *Nature* 146 (1940), 107-108 and 'Science in War', *Nature* 146 (1940), 112-113.

³⁴ See Lord Zuckerman, 'Scientific Advice During and Since World War II', *Proceedings of the Royal Society of London*, 342 (1631), 467; see also McGucken, 'The Royal Society and the Genesis of the Scientific Advisory Committee to Britain's War Cabinet, 1939-40', 104-105; see also J.G. Crowther, *Fifty Years with Science* (London: Barrie and Jenkins, 1970), pp. 94, 210, and 222. The Tots and Quots were named after the Latin label 'quot homines, tot sententiae': among the members were Blackett, Bernal, J.G. Crowther, Julian Huxley, and C.P. Snow; Gummett, *Scientists in Whitehall*, p. 61.

³⁵ Publishers note to Anonymous, *Science in War* (Harmondsworth: Penguin Books, 1940).

On, or around the same day in which Churchill prepared his memo for the War Cabinet, A.V. Hill prepared his own memo entitled 'Scientific Research and Technical Development in Government Departments'. It detailed that service (and other) Ministries had to make proper use of scientific knowledge and research. It told how few of the political leaders of Britain had any personal acquaintance with science or technology, nor could get much help from their higher civil servants. It emphasised the very great importance in modern Government, particularly during modern war, of scientific research and technical development, and that the urgency with which scientific problems may arise required that science and technology should be able to exert a direct and sufficient influence on policy. Hill commented on the wise planning involved in the creation of a Council for Scientific Research and Technical Development attached to the Ministry of Supply in early 1940, and recommended the same principle for all other Ministries, particularly the Admiralty, and the Ministries of Aircraft Production, Agriculture, Food, and Health.

Above all, and to complete the organisation, Hill recommended the further step of establishing a small central authoritative body, to which reference could be made in such matters as (a) major scientific appointments, (b) general scientific policy, (c) urgent new scientific problems suddenly emerging, and (d) the co-ordination of, and prevention of overlap in, the work of the various Government and other agencies. Such a body, Hill recommended, (in the same vein as the unheeded recommendation to Churchill in June 1940 by Sir William Bragg), would need a permanent secretary at the Cabinet Office best attached to the Lord President of the Council. Hill concluded the five-page memo by commenting on the real feeling among scientists that much more might be done and that as this feeling represented a genuine desire to help, 'attempts should be made to meet it'.³⁶

³⁶ CCAC AVHL I 2/1, 'Scientific Research and Technical Development in Government Departments', undated but accompanying letter was dated 10 September 1940; see also TNA CAB 21/829; see also McGucken, 'The Royal Society and the Genesis of the Scientific Advisory Committee to Britain's War Cabinet, 1939-40', 105-106.

What this memo was proposing was not overly radical. Nor was it overtly centralised or unconstitutional. Indeed, such a proposal under such extreme wartime circumstances, to attach active scientific co-ordination to each of the Government Ministries seems with historical hindsight to have been a very sensible and logical request. Hill sent this memo to Wing Commander Elliot attached to the Treasury, explaining in the accompanying letter that he proposed to make a nuisance of himself until either something was done about it or he was 'squashed'.³⁷ W/Cdr Elliot directly wrote to Sir Alan Barlow also of the Treasury asking how he should like the letter answered. Barlow then wrote a further memo to Lord Hankey which later reached Churchill for his consideration. This commented on the general malaise among scientists and that it would probably be worthwhile to appoint a committee 'if only to allay distrust'. The Barlow memo suggested that the committee proposal previously received by Bragg was 'as good as any'. It further stated that this new committee 'ought not to be given a roving commission or be encouraged to think that it will have a voice in general Government policy or on non-scientific subjects'.³⁸

In the House of Commons on 19 September 1940 Liberal National MP Sir Henry Morris-Jones raised a question on behalf of a Mr. E.J. Williams, for Churchill to answer, as to whether he would 'consider the formation of a whole-time scientific committee from the Royal Society', to investigate every portion of the country's war effort, to propose new ways of waging war, and to have direct contact with the Cabinet to promulgate its views and emphasise its recommendations. Clearly Hill's efforts were, if little else, spreading some murmurs within the corridors of power. In Churchill's absence, the Lord Privy Seal, Clement Attlee, replied that

³⁷ TNA CAB 21/829, Hill to W/Cdr Elliot, 10 September 1940.

³⁸ McGucken, 'The Royal Society and the Genesis of the Scientific Advisory Committee to Britain's War Cabinet, 1939-40', 108-110.

representations which had been received from the Royal Society as to closer co-operation with the Government were under active consideration.³⁹

Hill read of this House of Commons debate the next day in *The Times*. He then chose to send his memo to Attlee, commenting that the enclosed statement dealt with the 'relations between science and Government' and contained 'certain concrete proposals'.⁴⁰ Hill also sent his memo to the Lord President of the Council, Neville Chamberlain. The position of Lord President of the Council was, in effect, the forerunner of a Minister for (or of) Science. Thus, Hill's accompanying letter to Chamberlain was frank, determined and direct and as such deserves attention here in its entirety:

Some three and a half months ago the President of the Royal Society wrote a letter to the Prime Minister containing a proposal to set up a small scientific body to help guide scientific development in connexion with the Government. There is a strong feeling among responsible scientific people that much greater advantage could be taken of our scientific resources and of the initiative of scientific men.

I have tried to set out the need and certain proposals for meeting it in the statement which I enclose. This has the full approval of Sir William Bragg and a number of my colleagues. Could I have the opportunity some time of discussing it with you?

It might be objected that present events are far too urgent for discussions which some would regard as rather academic. This urgency, in fact, is exactly what impels me to press the matter now. The country is having to face many acute and novel difficulties and will have to face more. To many of these, science can provide essential help in guiding us to a solution. Often it may not be so much a matter of protracted research as of using the quick initiative of scientific people in applying existing knowledge. May I take the single example of the present air-raids at night? These involve on the military side considerations of probability (in connexion with the tactical use of available gun-power) and of methods, instruments and equipment, and I am glad to say that General Pile, the C. in C. A.A. Command, has been very anxious to avail himself of the best possible scientific advice: on the air side they involve similar considerations: on the civil side they involve questions of probable epidemics, of engineering, of communication, of nutrition and of psychology.

This is the very time therefore that the full resources of science are needed. One realizes the heavy burdens which Members of the Government have to bear: had this really been an academic matter I should not have bothered you with it now. I feel, however, that the urgency of the problems which now beset us, and of those we shall have to face in the

³⁹ Sir H. Morris-Jones in *Hansard Parliamentary Debates* (HC), Fifth Series, Vol. 365 (London: HMSO, 1940), p. 202.

⁴⁰ CCAC AVHL I 2/1, Hill to Clement Attlee, 21 September 1940.

next months, is such that one would be failing in one's duty if one delayed any longer to ask for a more confident use of our scientific resources.⁴¹

The replies Hill received from both men were very encouraging. Attlee wrote:

I agree that the harnessing of our best scientific brains to the war effort is urgently desirable and when I said in my answer to E.J. Williams in the House on 19 September that the representations made by the Royal Society were 'under active consideration' I really meant what I said. The matter has been thoroughly gone into and for your private information I may tell you that the Lord President is now making recommendation to the Prime Minister, the nature of which he hopes will go far towards meeting the views of yourself and the Royal Society.⁴²

Chamberlain, as eloquent as ever, was even more convincing in his encouragement. He wrote:

No one is more conscious than I am of the importance of harnessing science to our chariot and making her one of the team that will ultimately win the war. Indeed, you are pushing at an open door so far as I am concerned and ever since Sir William Bragg's letter reached the Prime Minister we have been examining his proposal and endeavouring to meet the Royal Society whose co-operation I know is most welcome to the Government.

For your private and personal information I may add that I have just made a recommendation to the Prime Minister on this subject which I hope he will see his way to accept and which will, I trust, go a long way towards meeting your views.⁴³

The eventual Scientific Advisory Committee was indeed of the same composition of Bragg's original proposal – the only difference being that it was not to be a War Cabinet Minister who would be its chairman. Although Bragg agreed at the time that the whole idea of the SAC operating at War Cabinet level was 'misconceived', removal of this proposed element arguably took the sting out of the tail.⁴⁴ The Chancellor of the Duchy of Lancaster Lord Hankey was requested instead to head the SAC and in reply to the request Hankey commented on the redundancy implicit within the proposed committee. But he also was aware of the feeling in high Government that 'some committee of the kind' was necessary 'if only to keep the scientific people quiet'.⁴⁵

⁴¹ TNA CAB 21/829, Hill to Neville Chamberlain, 21 September 1940. The letter is reproduced here exactly as Hill wrote it.

⁴² CCAC AVHL I 2/1, Attlee to Hill, 25 September 1940.

⁴³ CCAC AVHL I 2/1, Chamberlain to Hill, 26 September 1940.

⁴⁴ McGucken, 'The Royal Society and the Genesis of the Scientific Advisory Committee to Britain's War Cabinet, 1939-40', 110.

⁴⁵ TNA CAB 21/829, Lord Hankey to Sir Alan Barlow, 20 September 1940.

Lord Hankey's thoughts were forwarded by Barlow to Chamberlain via Sir Horace Wilson, still Chamberlain's personal secretary and Head of the Civil Service. Wilson wrote to Chamberlain that he thought the proposed committee would satisfy the [Royal] Society and at the same time strengthen the confidence of the public in that it would be standing proof that science was being given its due place in the scheme of National Defence. Moreover, it would meet some of the ill-formed, if not ill-natured, criticism contained in the Penguin Book *Science in War* which had had a large circulation. He therefore recommended that as Lord President of the Council, Chamberlain should approve Lord Hankey as Chairman of the proposed committee.⁴⁶

On the 2 October 1940, Neville Chamberlain signed the papers of approval for the establishment of the SAC. This was the last official act he undertook as Lord President of the Council.⁴⁷ Contrary to what the newspapers reported it was Barlow who informed Bragg of the Prime Minister's approval to appoint a Scientific Advisory Committee with a secretary from the Cabinet Secretariat.⁴⁸ Nonetheless, the newspapers were enthusiastic over the Royal Society success; the *Daily Telegraph* announced that a 'Brains Trust' would aid the Cabinet; while *The Times* heralded a new 'kind of scientific powerhouse' from which great things might be expected.⁴⁹ The scientific journal *Nature* saw the newly appointed SAC being able to perform a vital service for the voice of scientific men outside Government service to be heard in the deliberations of the various ministries.⁵⁰

⁴⁶ TNA CAB 21/829, Sir Horace Wilson to Neville Chamberlain, 23 September 1940.

⁴⁷ Clark, *Tizard*, p. 274.

⁴⁸ TNA CAB 21/829, Barlow to Bragg, 27 September 1940.

⁴⁹ 'Brains Trust', *Daily Telegraph*, 3 October 1940, cited in Edgerton, *Warfare State*, p. 165; *The Times*, 3 October 1940, p. 5; see also 'Aid of Science and War', p. 4 for a full breakdown of the body of advisors. For a detailed (albeit later) account of the advisors see RSA HD/8/8/2/14/30, 'Science in Britain II: The Scientific Advisory Committee to the War Cabinet' by J. G. Crowther, undated but certainly written in 1942.

⁵⁰ 'Science and the National War Effort', *Nature* 146 (1940), 470.

Five days later, Churchill announced to the House of Commons that he believed that the new 'Advisory Council' commanded the support and acceptance of the scientific world.⁵¹ The brief of the SAC was to 'advise the Government on scientific problems referred to it; to advise Government departments when required on the selection of individuals for particular lines of scientific inquiry, or for membership of committees on which scientists were required; and to bring to the notice of the Government promising new developments of importance to the war effort'. This was a considerably more limited role than the Royal Society had wished for and one which still left scientists without any real power to influence decisions at the highest level of politics. This task was left to Professor Lindemann alone.⁵²

Herein lay the problem of the SAC. Of prime concern to the Prime Minister was that secret investigations being undertaken by the various ministries should not be imparted to a new wide circle. Thus the SAC was approved primarily by Churchill only on the understanding that 'we are to have additional support from outside rather than an incursion into our interior'.⁵³ Thus, Churchill reluctantly agreed to the creation of the organisation primarily to satisfy the pressing and 'agitating' scientists, and to display that proper steps were being taken to apply their talents to the conduct of the war.⁵⁴ 'Rab' Butler, who served as Chairman of the SAC in 1943, recalled in his memoirs how the 'sharp-witted, sharp-tongued, pertinacious and more than slightly conspiratorial' Professor Lindemann thought the SAC not 'worth a moment of his worry'. The Prof further told Butler that it was a pity the SAC had ever been appointed, and confirmed that it had been called into existence only to appease the *amour-propre* of the scientific establishment.⁵⁵

⁵¹ Churchill in *Hansard Parliamentary Debates* (HC), Fifth Series, Vol. 365 (London: HMSO, 1940), pp. 231-232; it is worth noticing here how Churchill referred to the SAC as a 'Scientific Advisory Council' – further demonstrating his distance from the Committee's creation.

⁵² Rose and Rose, *Science and Society*, p. 70.

⁵³ TNA CAB21/829, Prime Minister minute to Chamberlain, 27 September 1940; see also J.R.M. Butler, *Grand Strategy*, Vol. 2 (London: HMSO, 1957), p. 354.

⁵⁴ William McGucken, 'The Central Organisation of Scientific and Technical Advice in the United Kingdom during the Second World War', *Minerva* 17 (1979), 37-38.

⁵⁵ Lord Butler, *The Art of the Possible, The Memoirs of Lord Butler* (London: Hamish Hamilton, 1971), p. 110.

And so – in such an unsupported and, in a sense, rather deceptive situation – the SAC on many occasions were either ignored or short-circuited by the one man recommendations of Professor Lindemann.⁵⁶ As Hill wrote in retrospect, ‘the War Cabinet Scientific Advisory Committee could have been much more useful if a scientific courtier had not monopolised the grace and favour of the Prime Minister’.⁵⁷ Here we begin to see hints of the animosity many of the top scientists had towards Lindemann. Moreover, here it is important to bring in the rather public and so often-discussed clash between Lindemann and that other great ‘statesman of science’, Henry Thomas Tizard.⁵⁸

This is not the place to detail the intricacies of their rivalry – this can be followed in each man’s respective biographies, suffice to say that Tizard’s 1940 resignation had much to do with Churchill becoming Prime Minister and Lindemann being his *éminence grise*.⁵⁹ Tizard had been integral to the radar defence of Great Britain, in particular in the operational research aspect of RAF pilot and ground-control readiness as well as operational use of radio in-flight. Indeed, Tizard was knighted for such and remains the true epitome of Boffinry. While Tizard was not in any way directly involved in the genesis of the SAC (he was in America on the much-lauded Tizard Mission at the time, returning just before the SAC’s inauguration), his resignation from his Air Ministry commitments in June 1940 had an enormous effect upon the many leading

⁵⁶ Clark, *Tizard*, p. 274.

⁵⁷ CCAC 920/HIL, A.V. Hill, ‘Memories and Reflections’ unpublished memoirs, p. 100.

⁵⁸ One of nine named *Statesmen of Science* (London: The Cresset Press, 1965) by J.G. Crowther.

⁵⁹ See Clark, *Tizard*; for the best on Lindemann see The Earl of Birkenhead, *The Prof in Two Worlds, the official life of Professor F.A. Lindemann, Viscount Cherwell* (London: Collins, 1961); for a mediating account of the Tizard/Lindemann clash see R. V. Jones and William S. Farren, ‘Henry Thomas Tizard 1885-1959’, *Biographical Memoirs of the Fellows of the Royal Society* 7 (1961), 313-348; see also R.V. Jones, ‘Science and the State’, *Nature* 200 (1963), 7-14; see also Paul Crook, ‘Science and War: Radical Scientists and the Tizard-Cherwell Area Bombing Debate in Britain’, *War & Society* 12 (1994), 69-101; for a more recent study covering the early days of the feud, see David Zimmerman, *Britain’s Shield, Radar and the Defeat of the Luftwaffe* (Stroud: Sutton Publishing Limited, 2001); For Lindemann as Churchill’s *éminence grise* see Ronald Lewin, *Ultra Goes To War: The Secret Story* (London: BCA, 1978), p. 78. It is important to note that Tizard resigned in 1940 from most, but not all, governmental advisory posts. He retained chairmanship of the Aeronautical Research Committee and remained a member of the Ministry of Supply’s Advisory Council. Both posts however offered very limited administrative power in comparison to his previous responsibilities. His decision to resign was a direct result of his uncharacteristic misjudgement over the German *Knickebein* navigational radio beams, although this episode was in fact the final straw for Tizard in his rivalry with Lindemann.

scientists who saw him as a beacon of science/state harmony.⁶⁰ Indeed, as Ronald Clark wrote, ‘the widespread discontent with the way in which scientific advice was being used by the Government had been brought almost to the boil by Tizard’s resignation’.⁶¹ Here is the linking factor; it is this which cries out for more historical consideration.

Of the few historians who have discussed the initiation and subsequent expedient nature of the SAC, none have linked it directly with Tizard being sidelined by Lindemann’s unpopular usurpation.⁶² Yet linking the Royal Society’s urgent demands for scientific involvement at War Cabinet level with the universal dislike for Lindemann amongst the scientific community is essential. There is much evidence which exists to fully confirm the support Tizard had from many of his scientific colleagues, and these can be found in the Tizard papers at the Imperial War Museum. A select few are key here. Following Tizard’s resignation, Blackett and Hill also wrote their resignations. Charles Darwin (grandson of *the* Charles Darwin) felt the need to express to Tizard:

How profoundly disgusted I am at the way you have been treated. It really does seem to me that we do not deserve to win [the war] when this sort of thing can come about by the agency of a pack of small-minded men!⁶³

Sir Alfred Egerton, the Physical Secretary of the Royal Society, was much more vociferous;

It is quite terrifying to realise when the country is in much danger that things like that can be happening, owing to personal intrigue.

This must be got right. It is partly due to science not being married in relation to the Government machine. As you know attempts to improve that organisation have been turned down over and over again. It should never happen that a Minister should *affait* a friend in such a supreme position as Lindemann holds without the advice and consent of those responsible for administration of the sciences. But this despotism will continue to happen til the organisation is improved...Its monstrous!⁶⁴

⁶⁰ For the most detailed account to date of the Tizard Mission, see David Zimmerman, *Top Secret Exchange: The Tizard Mission and the Scientific War* (Stroud: Alan Sutton Publishing, 1996); see also Clark, *Tizard*, pp. 248-272.

⁶¹ Clark, *Tizard*, p. 316.

⁶² Ronald Clark ‘skirted’ around the issue in his chapter ‘Doubt at the Top’ (*The Rise of the Boffins*, pp. 152-166), but his mandate was primarily centred around Tizard. Clark detailed the animosity which amassed over Lindemann and stated that it was ‘against this background that the SAC was formed. See also Clark, *Tizard*, p. 240.

⁶³ Imperial War Museum (hereafter abbreviated to IWM) HTT250, Charles Darwin to Henry Tizard, 28 June 1940.

⁶⁴ IWM HTT250, Sir Alfred Egerton to Tizard, 26 June 1940.

Hill also wrote to Archibald Sinclair – the Secretary of State for Air. After praising Tizard's accomplishments and abilities Hill wrote how Tizard had effectively been ousted by a man whose judgement was mistrusted by them all, and as a consequence, all Tizard's work was being undone. Hill further wrote:

In the ordeal which this country may soon have to face – and in preparing for it now – it will be disastrous if the best advice is not available, and if action is not taken quickly for it. It cannot be unless the present unhappy situation is drastically altered. This is not just a matter only of Tizard, but of the effective use of our scientific and technical assets and resources in waging war – and not squandering them in wild goose chases.⁶⁵

A month later Sir William Bragg – who it will be recalled was President of the Royal Society, and now more than ever determined to implement the SAC – wrote to Hill:

If I can back you in any way I shall be glad to do so. We want to make clear that it is not a feud between rival gangs of scientists which prompts our action, but the general concern of all responsible scientists that one of their number, and he not one of the most reliable, has been put in the position of being arbiter and is making decisions or influencing policy without proper knowledge or judgement or collaboration with others.⁶⁶

Thus we can quite clearly see how Tizard's resignation owing to Lindemann's prime position at Churchill's right-hand side had a significant impact upon the demands of the Royal Society for a more involved role in wartime policy-making decisions. As the biographer of Tizard exclaimed, 'this shabby edging out of Britain's most competent defence scientist was symptomatic of a wider failure both to understand the essential task that science should have been allowed to do at the highest level, and to co-ordinate the multifarious work of the Ministries'.⁶⁷

⁶⁵ IWM HTT58, Hill to Archibald Sinclair, 30 June 1940; it is very likely that the 'wild goose chases' Hill referred to were with regard to aerial mines and infra-red detection. These formed particular favourite projects of Lindemann's and thus of Churchill's (see Hartcup, *The Challenge of War*, pp. 253-257).

⁶⁶ IWM HTT58, Bragg to Hill, 29 July 1940.

⁶⁷ Clark, *The Rise of the Boffins*, p. 161.

In his resignation letter, Tizard stated that he was resigning from his ‘present ill-defined responsibilities’.⁶⁸ More importantly, Tizard expressed that if the Air Ministry, and indeed the Prime Minister, were to have an independent adviser, then he should enjoy full confidence – this, Tizard stated, he could not give at that time. What is interesting is that Tizard’s ‘ill-defined responsibilities’ remained as such for the duration of the war. The only two mentions of Tizard in Parliament (according to *Hansard*) throughout the war were in reference to his position. In the first, in November 1940, the Prime Minister was asked about the nature of work being carried out by ‘Sir Henry Tizard’ on behalf of the Government. Attlee (for Churchill) replied that it was ‘not in the public interest to disclose the exact nature of Sir Henry Tizard’s duties’. Attlee further confirmed that ‘Tizard’ was being employed in the ‘best possible way in the Air Ministry and the Ministry of Aircraft Production’. Labour MP Ernest Thurtle interceded asking Attlee whether he could give assurance that no scientific professor or expert had the ‘exclusive ear of the Prime Minister in regard to matters of scientific research’. Liberal MP Sir Geoffrey Mander concluded the debate by stating that a good many people did not feel satisfied that ‘this Gentleman’ (Tizard) was being fully employed to the best advantage.⁶⁹ The second was related to Tizard’s full resignation from all Government positions in 1942 following Lindemann’s elevation to Paymaster-General.⁷⁰

For some commentators, such as C.P. Snow for example, the Tizard/Lindemann clash has been allowed to obscure the central fact that there was much more at stake than simply a personal issue.⁷¹ As Bragg’s letter confirmed, it was in fact a fundamental argument about the whole scientific direction for the conduct of the war. That this conflict between science and politics was

⁶⁸ TNA AVIA 43/5, Tizard to Sinclair, 21 June 1940; also quoted in full in Clark, *Tizard*, p. 238.

⁶⁹ *Hansard Parliamentary Debates* (HC), Fifth Series, Vol. 365 (London: HMSO, 1940), pp. 1416-1417; the incorrect spelling of Sir Henry Tizard’s name five times (including index) in *Hansard’s Parliamentary Debates* really was an unforgivable oversight considering how much this scientific statesman had been involved in the Defence of Britain. It is also worth noting that Sir Geoffrey Mander served in the Royal Flying Corps during the First World War.

⁷⁰ *Hansard Parliamentary Debates* (HC), Fifth Series, Vol. 383 (London: HMSO, 1942), p. 1087; Tizard’s name was correctly spelt in this mention.

⁷¹ C. P. Snow, *Science and Government* (London: OUP, 1961); see also C.P. Snow, *A Postscript to Science and Government* (London: OUP, 1962).

primed to break into the open was obvious to the few who have since narrated the story of the SAC – how it was alleviated was not. The only historian to have hazarded a plausible possibility was Clark who claimed that invasion of Britain appeared imminent and thus all effort had to be concentrated against that one looming threat.⁷² This would certainly account for the fact that three months passed between Tizard's resignation and the creation of the SAC. It can also account for the diffusion of hostility stemming from the scientists. But by the end of September 1940 – after the Battle of Britain – Tizard was due to return from his scientific mission to the United States. By then, of course, Attlee and Chamberlain had assured Hill that motions were in place for the creation of the SAC. Whether Churchill and Lindemann privately saw the emerging new scientific body as a means to diffuse the metaphorical scientific bomb under their throne must remain as interpretation.⁷³ However, the available evidence correlated together does suggest that this was the most probable possibility.

Hill was certainly pleased with his victory, as were many of his colleagues. Dr. Charles Goodeve, a Canadian scientist and Royal Navy volunteer with the Admiralty research establishment *HMS Vernon*, wrote to Hill;

A.V. this looks like quick work. All power to you. I hope there will be a sub-committee for the Admiralty and that Tizard will be brought into it.⁷⁴

Hill later claimed that the SAC actually undertook a number of important tasks.⁷⁵ Amongst those worthy of mention were scientific studies into the need to secure Britain's food supplies and into reports that the Germans were constructing a channel tunnel. It was in a good position to collect

⁷² Clark, *Tizard*, p. 240.

⁷³ Understandably, no Churchill biographies narrate the events surrounding the SAC. Interestingly, the Lindemann biographies only pay very slight attention to the organisation. See Birkenhead, *The Prof in Two Worlds*, p. 95 and Adrian Fort, *Prof, The Life of Frederick Lindemann* (London: Jonathan Cape, 2003), p. 262. Fort wrongly states that Tizard resigned as chairman of the SAC in June 1940, when in fact he resigned from the post of Scientific Advisor to the Chief of Air Staff. Thomas Wilson in *Churchill and the Prof* (London: Cassell, 1995) and R.F. Harrod in *The Prof, A Personal Memoir of Lord Cherwell* (London: Macmillan & Co. Ltd., 1959) make no mention of the SAC at all.

⁷⁴ CCAC AVHL I 2/2, Dr. Charles Goodeve to Hill, 30 October 1940.

⁷⁵ Hill, 'Memories and Reflections' p. 100.

expert evidence and it controlled a number of specialist panels and sub-committees.⁷⁶ It investigated the warlike development of atomic fission, gave the atomic research project its deceptive name of 'Tube Alloys' and strongly advised that the whole project be transferred to Canada and America due to the stretched capacity of British resources.⁷⁷ Hill's particular favourite of SAC's accomplishments was convincing the Home Office to release from internment any enemy 'aliens' which had scientific attainments which could be put to use by the Royal Society to benefit Britain's war effort.⁷⁸

An unexpected by-product of the SAC was the creation of its sister-organisation, Engineering Advisory Committee (EAC). One of the main reasons given against the formation of a Scientific Advisory Committee was that by its very scientific nature it would discount engineering concerns. Following the SAC's inauguration engineering matters were pressed further and, with one leading to another, the concerns of engineers were smoothly appeased with the formation of the Engineering Advisory Committee (EAC) to the War Cabinet on 30 April 1941, with Lord Hankey acting as Chairman to both the SAC and the EAC. Most interestingly, Tizard – who by 1941 was once again slowly increasing his governmental advisory activities – served as a member of the EAC. Nonetheless, even Tizard admitted that the EAC was 'really set up because the engineers felt their nose had been put out of joint because of the formation of the SAC'.⁷⁹

By May 1942, however, with the British suffering continuous defeats by Rommel from Libya to Egypt, many blamed the inferiority of British Tanks and the EAC were accused of ineffectiveness. In addition, there was heated public debate over the question of strategic bombing; a debate that the SAC were far removed from. Thus, although the SAC and the EAC had brought scientists and engineers to the heart of Government, unlike Lindemann they did not

⁷⁶ See Clark, *Tizard*, p. 275; see also Gummert, *Scientists in Whitehall*, p. 30.

⁷⁷ Hill, 'Memories and Reflections', p. 100.

⁷⁸ A.V. Hill, *The Ethical Dilemma of Science and Other Writings* (London: The Scientific Book Guild, 1962), p. 333.

⁷⁹ Clark, *Tizard*, p. 295.

(and would not) have direct access to the Prime Minister. Nor were they involved in the allocation of the correct knowledge able to deal with the problems of military technology which occurred during the war.⁸⁰

Ultimately then, the consensus of the SAC's very limited executive powers was of disappointment. According to Richard Gregory, Editor of the science journal *Nature* and Chairman of the British Association for the Advancement of Science, the general attitude of all statesmen in executive authority was that scientific experts should be 'on tap but not on top'.⁸¹ Not only was this statement harking back to Lindemann's role of 'power without responsibility – power greater than that exercised by any scientist in history',⁸² but it also emphasised how little the scientists felt they were being applied to the war effort. Moreover, Gregory emphasised that when the scientific community were reluctantly consulted they had no power to put their advice into action.⁸³ Lord Hankey also commented on the limited powers of the SAC.⁸⁴ This was further acknowledged by Tizard who said that the SAC was 'really very ineffective'.⁸⁵

In addition, owing to the ambiguous nature of the SAC and the EAC, on occasions during the course of the war, questions were raised in the House of Commons. These were often skilfully 'batted' aside by the new Lord President of the Council – Sir John Anderson – owing to the proceedings being of a 'highly confidential nature'.⁸⁶ To further add to the ambiguity, on 29 September 1942, it was announced that the newly-formed Ministry of Production (MAP)

⁸⁰ McGucken, 'The Central Organisation of Scientific and Technical Advice', 44-45; this paper by McGucken provides a full detailed account of the formation and activity of the EAC.

⁸¹ A tiresome cliché according to Lord Ashby but appropriate nonetheless; see Lord Ashby, 'Scientists in the Whitehall Village', *Minerva* 19 (1983), 640-643.

⁸² Birkenhead, *The Prof in Two Worlds*, p. 211.

⁸³ CCAC AVHL I 2/1, Richard Gregory to Hill, 18 December 1940.

⁸⁴ McGucken, 'The Central Organisation of Scientific and Technical Advice', 60.

⁸⁵ Clark, *Tizard*, p. 275.

⁸⁶ *Hansard Parliamentary Debates* (HC), Fifth Series, Vol. 372 (London: HMSO, 1941), pp. 1211-2; *Hansard Parliamentary Debates* (HC), Fifth Series, Vol. 373 (London: HMSO, 1941), p. 452, p. 485-6, pp. 735-6 and p. 750; *Hansard Parliamentary Debates* (HC), Fifth Series, Vol. 374 (London: HMSO, 1941), pp. 2042-3; *Hansard Parliamentary Debates* (HC), Fifth Series, Vol. 378 (London: HMSO, 1942), p. 2015; *Hansard Parliamentary Debates* (HC), Fifth Series, Vol. 383 (London: HMSO, 1942), pp. 1087-8.

proposed to appoint three men of scientific and technical eminence on a 'whole time basis'. Two days after this announcement, confused MPs requested clarification of just exactly which scientists were on the SAC. So Anderson finally fully announced the details of the members and functions of the SAC to the house.⁸⁷

Even Hill stated a year after the SAC was formed that while the deliberate application of science in Government was a new method, if it was to have any chance of success, it had to be saved from sloppy thinking, careless handling or unscrupulous use.⁸⁸ Thus, while the SAC had (at least) alleviated the volatile and vocal pressure of the 1940s, fermentation of scientific hostility as well as political ambiguity continued throughout the war. As late as 1943 Sir John Anderson commenced investigations into the continued scientific anxiety. These he concluded stating that he was fully conscious (and had been for some time) that there was 'something not quite right in the higher organisation of scientific effort in relation to the functions of Government'.⁸⁹ Not quite right was how it stayed until long after the war.

Perhaps it would be wrong to end debate on Second World War integration of science and British politics with a complete air of negativity. While the genesis of the SAC does indeed show the reluctance of Churchill and Lindemann to have their innards meddled with, we should not forget the fact that Churchill was the first British Prime Minister to have a scientist as one of his closest advisers.⁹⁰ Moreover, he was the first premier to introduce into Government at its highest

⁸⁷ *Hansard Parliamentary Debates* (HC), Fifth Series, Vol. 383 (London: HMSO, 1942), pp. 927-28; the ambiguity of the SAC has extended into Second World War historiography. Arthur Marwick, for example, wrote that 'in October 1942 the Scientific Advisory Committee of the War Cabinet was appointed, sitting at first under the chairmanship of Lord Cherwell', (*Britain in the Century of Total War*, p. 288). On both accounts this is wrong. For more information on the Ministry of Production scientific advisers, see Oliver Lyttleton, Viscount Chandos, *The Memoirs of Lord Chandos, An Unexpected View from the Summit* (New York: New American Library, 1963); see also McGucken, 'The Central Organisation of Scientific and Technical Advice', 59-69.

⁸⁸ A.V. Hill quoted in 'Science and Government', *Nature* (148), 425.

⁸⁹ Anderson quoted in Clark, *The Rise of the Boffins*, p. 166.

⁹⁰ In reference to Churchill's statement quoted in Clark, *The Rise of the Boffins*, p. 158.

level something of the scientific method, whether for the right reasons or not.⁹¹ Even Tizard was appreciative of this fact. In a speech to the Parliamentary and Scientific Committee on 3 February 1942, he generously praised Churchill's involvement with science and asked; 'What previous Prime Minister of England ever had a scientific adviser continually at his elbow?'⁹² This principle spread throughout the services and eminent scientists were appointed across the board in the capacity of scientific advisers. They lived and had their being alongside the people actually controlling the operations and thereby became part of the policy-making machine.⁹³ This proved one of the key aspects of victory for the Allies and was the principle Tizard above all appreciated the most. Indeed, in a post-war lecture, Tizard referred to a military man who stated that he could hardly walk in any direction of the war without tumbling over a scientist who had got in his way.⁹⁴

R.V. Jones, one of the few scientists who interacted well with both Lindemann and Tizard during the war, firmly believed that the British state benefitted hugely from the attributes of both Tizard and Lindemann and had nothing detrimental to say of either. He stated that as befitted their chosen paths, Tizard was probably the better at co-operation between science and the services, while Lindemann was probably more alert politically. However, while Lindemann was prepared to sacrifice any reservations for Churchill (and the Conservatives), Tizard was too balanced a man to give himself completely to a political party.⁹⁵ It is here that the fundamental principle of the problem resides. Can (or should) scientists follow ideology? Does scientific truth

⁹¹ Professor A.M. Low, 'Churchill and Science' in Charles Eade (ed), *Churchill by his Contemporaries* (London: Hutchinson, 1953), p. 446.

⁹² Clark, *The Rise of the Boffins*, p. 162; also quoted in Clark, *Tizard*, p. 317; for the full text of Tizard's 1942 speech to the Parliamentary and Scientific Committee, see Hill, 'Memories and Reflections', pp. 112-123.

⁹³ Sir Frederick Brundrett, 'Government and Science', *Public Administration*, 34 (1956), p. 249.

⁹⁴ Clark, *The Rise of the Boffins*, p. 162; see also Hill, 'Memories and Reflections', p. 114.

⁹⁵ R. V. Jones, 'Scientists and Statesmen: The Example of Henry Tizard', *Minerva* 4 (1966), 206. It may well be useful to note here that Jones was recommended for Royal Society Fellowship by Lindemann, was his Oxford pupil from before the war, and indeed benefitted greatly from Lindemann's influence with Churchill during the war. Nonetheless, Jones wrote more appraisals of Tizard's career than he did Lindemann's, and also wrote the biographical memoirs of Churchill for the Royal Society. In short, his evaluation of both men can be said to be entirely without prejudice.

not inevitably clash with political necessities? Can the intentional giving of ‘biased or slanted’ testimony ever be compatible with the principles of a scientist?⁹⁶ These questions have continued to prove difficult to answer. And so – as Jones wrote, ‘whether future crises will produce their Churchills or not, the problem of injecting scientific advice into Government will [always] remain’.⁹⁷ Historian Angus Calder stated that the Tizard/Lindemann clash illustrated the uncomfortable truth that when the scientist became involved in Government, his claim to objectivity was jeopardised by the ambience of top-level politics.⁹⁸ Philosophers have often debated since that high-science and high-politics just do not mix; conversely, historians on the whole have not seemed overly concerned.⁹⁹

A refreshing outlook to studying history is to determine just what lessons should be learnt by the episodes narrated. Of the creation of the SAC, it can certainly be confirmed that it was indeed a sop of political expediency. As shown, this was a direct result of the frayed relationship between the eminent scientists in positions of influence and Churchill’s friend and scientific advisor, F.A. Lindemann, caused by Tizard’s untenable position. Furthermore, the Tizard/Lindemann conflict was remarkable by virtue of Lindemann’s complete victory and total crushing of his scientific opposition.¹⁰⁰ A key lesson of this episode was rightly highlighted by C.P. Snow: in his postscript to *Science and Government*, he stated that ‘if you are going to have a scientist in a position of isolated power, the only scientist among non-scientists, it is dangerous *whoever he is*’ (Snow’s emphasis). Snow continued with the warning that regardless of ‘whether he is wisest scientist in

⁹⁶ R. V. Jones, ‘Temptations and Risks of the Scientific Adviser’, *Minerva* 10 (1972), 442.

⁹⁷ Jones, ‘Scientists and Statesmen’, 212-213.

⁹⁸ Angus Calder, *The People’s War 1939-45* (London: Jonathan Cape, 1986), p. 463.

⁹⁹ See as examples, Nevan Sesardić, ‘Science and Politics: Dangerous Liaisons’, *Journal for General Philosophy of Science* 23 (1992), 129-151; Mark B. Brown, ‘The Political Philosophy of Science policy’, *Minerva* 42 (2004), 77-95 in review of Philip Kitcher’s *Science, Truth and Democracy* (New York: OUP, 2001); Jean-Jacques Salomon, ‘Science, Technology and Democracy’, *Minerva* 38 (2000), 33-51. The latter article is excellent for the distinction between scientists, experts and policy-makers and for the delineation of, and need for, transparency and public participation in contemporary scientific and technological issues; With notable exception of a very few historians, particularly David Edgerton and Roy Macleod; from the latter, see particularly ‘Science and Democracy: Historical Reflections on Present Discontents’, *Minerva* 35 (1997), 369-384.

¹⁰⁰ Herbert Goldhamer, *The Adviser* (New York: Elsevier, 1978), p. 101.

the world, we must not tolerate a scientific overlord again'.¹⁰¹ Yet as R.V. Jones commented in his response to Snow's infamous 1960 Godkin Lecture and subsequent 1962 postscript, some form of scientific leadership [was] is necessary; and that the danger lies not in the power, but in the isolation. 'Provided that the scientist concerned does not isolate himself from the experience and opinions of his fellow scientists', Jones wrote, 'but instead takes care to consult them, he may provide the best possible link between a non-scientific administration and the scientists on which it so heavily depends'.¹⁰²

Jones made one other very important point which is most appropriate here: Lindemann (or Cherwell) was not a scientific dictator, and indeed, Jones firmly believed that he did not wish to be one either. Even at the height of his personal power, Lindemann could not have got his way in policy without a good deal of support from others. Thus the war scientific situation was not as dangerous as Snow made it to be; Lindemann usually got his way in major matters, but only when he had a fair measure of support; indeed, as Jones recalled, Lindemann was much the happier knowing he had authoritative technical backing.¹⁰³ This was further confirmed by another contemporary who wrote that Lindemann supplied the link between Churchill – the statesman who realised the importance of science – and the many scientists who lacked

¹⁰¹ Snow, *A Postscript to Science and Government*, p. 35. This is an interesting point for debate. We cannot assume that the 'scientific overlord' factor relative to Lindemann was specifically a wartime phenomenon. As Cherwell, he was recalled by Churchill in his 1951-1955 administration, and once again sat at his 'master's right-hand side'. Thereafter the Chief Scientific Adviser role of Lord Zuckerman also provided direct access to the Prime Ministers Harold Wilson and Edward Heath respectively. These two were, however, Whitehall anomalies; see Ashby, 'Scientists in the Whitehall Village', 641. Tizard too played much the same role for the Atlee administration.

¹⁰² R. V. Jones, 'Lord Cherwell's Judgement in World War II', *The Oxford Magazine*, 9 May 1963, 279-286; also published (without Appendix) in *Journal of the Royal United Services Institute* 108 (1963), 321-327. The original transcript of this article can be found at TNA CAB 21/5833. It is worth highlighting that Jones sought permission from the government for publication of this rebuttal to Snow's Godkin Lecture as he wished to bring fresh, and then still classified evidence to bear. This permission, of course, was granted. There is a very important paragraph missing from the *RUSI* publication of this article which is worth repeating here in full. Jones wrote, 'Sir Charles misses another point. The democratic system that so sensibly brought Tizard to the top also produced a succession of three Prime Ministers; Ramsay Macdonald, Stanley Baldwin and Neville Chamberlain. And the inability of the democratic system with these leaders and their supporters to cope with Adolf Hitler led us to the debacle of 1940. In that emergency, we called for Winston Churchill; and we had to accept, as part of our salvation, any governmental arrangement that he wished to make. Lindemann's advise was part of that arrangement; and even if it was not always good, we should be grateful for the vision of the first British Prime Minister to rate the value of science and technology so highly that he demanded personal scientific advice.'; (p. 264).

¹⁰³ *Ibid.*, 263-264.

Lindemann's own special gift of being able to make highly technical matters quickly intelligible to a man of Churchill's disciplined intellect.¹⁰⁴ However, as we have seen, this degree of co-operation was far from expected by the majority in the summer of 1940.

Churchill's and Cherwell's history of the war is well known.¹⁰⁵ As for Tizard, in 1942, he resigned from the Ministry of Aircraft Production and the Air Council to become President of Magdalen College in Oxford. He relinquished the last of his Air Ministry posts in July 1943 and flew to Australia to assist their war with some scientific advice. It is important to point out that there is no existing evidence to suggest that these later resignations had anything to do with Lindemann gaining a peerage and a seat in the Cabinet as Paymaster-General. Nonetheless, both men were as responsible as the other for the continuance of their squabble for the remainder of the war. A fellow colleague of both recalled that the feud got so bad that the two men could not endure in silence each other's presence in the same city; that both eminent gentlemen behaved like a couple of spoiled children; and that this was the only matter in which Tizard was found to be unreasonable, but that Cherwell was worse.¹⁰⁶

Throughout the war, the members of the SAC remained in close and regular contact with Tizard, both as friends and as Royal Society colleagues; and when the three scientific advisers (mentioned earlier) were to be appointed to MAP in September 1942, it was suggested that one of their first meetings should be with Tizard, rather than with Cherwell.¹⁰⁷ Yet owing to the structure of high scientific advice these advisers were referred to by Tizard (not with a small

¹⁰⁴ Low, 'Churchill and Science', p. 446.

¹⁰⁵ See as example Wilson, *Churchill and the Prof.*

¹⁰⁶ Sir Frederick Brundrett, 'Sir Henry Tizard, G.C.B., A.F.C., F.R.S.', *Nature* 185 (1960), 209-211; see also Clark, *Tizard*, p. 350 and The Earl of Birkenhead, *Prof in Two Worlds*, pp. 211-212.

¹⁰⁷ Clark, *Tizard*, p. 296. The three scientists appointed to MAP were Sir Ian Heilbron FRS, Sir Thomas Merton FRS, and Sir William Stanier. Their appointment was a direct response to Tizard's 1942 speech to the Parliamentary and Scientific Committee which in reply presented a motion to the House of Commons. The motion was supported by 145 members of all parties, and was championed by A.V. Hill; see Rose and Rose, *Science and Society*, p. 71. This too can be seen as a political expediency.

degree of cynicism) as the ‘Three Blind Mice’.¹⁰⁸ Furthermore, it is worth commenting that the initial suggested appointment of these MAP scientific advisers led Churchill to accuse the Minister of Production – Oliver Lyttleton (later Lord Chandos) – of expanding his own ‘empire’ and invading some of Churchill’s.¹⁰⁹ This perhaps can be seen as further confirmation that Churchill much preferred there to be only one channel of governmental scientific advice; and that was expressly to be through his dear friend, Lord Cherwell.

It has been written that Winston Churchill’s ubiquitous interest and energy enabled him to dominate the whole war effort and by his personal intervention to give when necessary, in his own words, ‘extreme priority and impulse’.¹¹⁰ This great force of drive and personality was undoubtedly a prime factor in Britain’s Second World War successes; but it also created a stifling environment for autonomous scientific organisation. Moreover, the arrival of Lindemann’s permanent presence in 10 Downing Street entirely undermined the positions of scientific advisers within the corridors of power. This was the environment in which the pleas of the scientists of the Royal Society were finally heeded and acted upon. Whether or not the creation of the SAC was as a direct response to Lindemann’s ever-rising power and Tizard’s responsive resignation must remain as conjecture. Nonetheless, the evidence, as shown, starkly demonstrates that this possibility is very strong indeed.

The only question which remains is whether the Royal Society Fellows were guilty of meddling in political matters which did not concern them. Based on the evidence presented in this article, this assertion is tenuous anyway, but upon further examination of the full documentation

¹⁰⁸ Clark, *Tizard*, p. 319.

¹⁰⁹ At a dinner party, Chandos recalled Churchill announcing to ‘some pretty and charming ladies’ of his attempts to appoint the triumvirate by declaring rather unfairly; ‘Here’s Oliver, always avid of power, now wanting to run the scientific side of the war; he’s going to take it over from me. He first has a spearhead of three graces, and so we may expect to see everything in the scientific field better run’. Chandos exclaimed that Churchill had, without much difficulty, made him look rather foolish. See Lyttleton, *The Memoirs of Lord Chandos*, p. 162.

¹¹⁰ Butler, *Grand Strategy*, p. 249.

available the assertion can safely be argued away. The Minutes of the Royal Society show that the SAC was extremely low on their agenda.¹¹¹ While this further confirms the relative impotence of the SAC, it also proves that these governmental responsibilities had little effect on the Royal Society itself. We can add here the fact that the Royal Society had persistently rejected any administrative connection during the nineteenth century in order to maintain political neutrality and scientific objectivity. The Society had long embraced a traditional reluctance to intrude into politics;¹¹² a tradition that would have only been broken out of a perceived absolute necessity. In short, it would not be wrong to assume that the Fellows were genuinely keen to help by offering their scientific brilliance to their nation state which, it has to be said, was still very naïve in scientific and technological matters. Their offer was not overt patriotism, nor did it stem from any degree of power machinations; it was their duties to science and their fellow man that were the motivating factors.

There is one great ironic twist at the end of the SAC story. After the war the Barlow Committee on Future Scientific Policy turned the SAC into the Advisory Council on Scientific Policy; although this dealt entirely with civil scientific matters only, there was a corresponding organisation called the Defence Research Policy Committee.¹¹³ With the Churchill and Cherwell scientific monopoly broken (albeit temporarily), the Attlee administration required a new man to head these new organisations and to advise them on their science policy programmes. They asked Sir Henry Tizard.

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¹¹¹ There are only three mentions of the SAC in the *Royal Society Minutes of Council* which are held in the Royal Society Library, London. In 15 (1940), 319, a meeting on 24 October regarding inauguration of the SAC itself; 16 (1945), 124, a meeting on 5 November 1942 regarding a draft secret report on patents; and p. 196, a meeting on 30 November 1943 regarding deferred publication of scientific research work.

¹¹² Roy M. Macleod and E. Kay Andrews, 'The Origins of the D.S.I.R.: Reflections on Ideas and Men, 1915-1916', *Public Administration* 48 (1970), 32 & 37.

¹¹³ See Edgerton, *Warfare State*, p. 165 and Gummett, *Scientists in Whitehall*, pp. 217-220.

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