Speaking of science

BBC science broadcasting and its critics, 1923–64

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I, Allan Clive Jones, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Abstract

Several times in the BBC's history, from the 1920s to the 1960s, scientific organisations (mainly the British Association) and numerous eminent scientists attempted to influence the management of science broadcasting. These attempts usually consisted of visits by scientific deputations to the BBC to argue for the reorganisation of science broadcasting.

The historical part of the thesis narrates the so-far unpublished story of these interventions at the BBC, drawing on archival primary sources. The thesis sets these interventions in their historical context, and also in the context of BBC science production. The historical context of science production at the BBC, described here, is another little researched and largely unknown topic.

The interventions are shown to have been strikingly consistent over several decades. Scientists argued that the public should be better informed about science, and that the BBC had a duty to promote the public understanding of science. To facilitate this, scientists argued that science production should be centralised, and that scientists should be given significant control over science programme planning. The responses of BBC managers to these interventions are shown also to have been strikingly consistent. Managers reiterated the professionalism and competence of production staff, and presented evidence of the BBC's commitment to science programming.

The thesis draws on several bodies of scholarship in concert to gain theoretical insight into these interventions. Specifically, theoretical ideas relating to science communication, boundary work, and the construction of scientific authority give analytical purchase on the conduct of the scientists. Similarly, theoretical ideas on the nature of professionalism, public-service broadcasting, and the relationship of organisational structure to behaviour give insight into the conduct of BBC managers, and into the conduct of the scientists. This theoretical background shows how the resolution of the issue in 1964 served a strategic function for the BBC.

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Note on references

For published works, author and date are given in a footnote on the page where a work is cited. Full bibliographic information is given in the references list at the end of the thesis.

For unpublished archival documents, on the page where a document is cited a footnote gives the archive where the document was found, together with file number and date as appropriate. At the head of the References section is a list of all the archival files consulted.

Introduction

On 29 May 1964 the BBC's Science Consultative Group held its first meeting. The assembled company was a mixture of scientists and BBC staff (managers and producers). Among the eight scientists were Sir Lawrence Bragg and Professor Herman Bondi. The Consultative Group, which met twice a year, was set up to review recent science broadcasts, and to cast an advisory eye over plans for future broadcasts.[1] Surviving minutes show that little of consequence was transacted at this meeting, or in subsequent ones.[2] Nevertheless, the Group was valued by BBC managers, for reasons that will be explained in the final chapter of this thesis. It continued to function for almost three decades, being disbanded during the 1990s.

Although the Science Consultative Group's discussions were anodyne, the debates that led to its establishment were often the reverse. The turbulent prehistory of the Consultative Group, and the interpretation of that prehistory, is the main business of this thesis. The prehistory dates back to the 1920s, when the BBC was a young institution, and scientific voices first questioned the way science broadcasting was organised. The following decades saw a number of interventions at the BBC by scientists, nearly always representing scientific institutions, and nearly always arguing for a change in the management of science broadcasting. The scientists in these interventions are the 'critics' of BBC science referred to in the subtitle to this thesis.

Two recurring themes of these scientific interventions were the need for a change of organisational structure of the BBC, and crucially, an increased role for the scientific world in planning BBC scientific programmes. The management of the BBC did not accede to these requests. At the heart of this disagreement between the BBC and scientific institutions were questions of authority and autonomy. Who is authorised to plan and implement science broadcasts? What does autonomy mean both for broadcasters and for scientists? Questions of authority and autonomy recur throughout this thesis.

In this thesis I intend to do three things:

1 To set the context of these interventions by looking at science broadcasting itself – the practices of producers, their attitudes to their roles, their responsibilities and their ways of interacting with the scientific world.

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1 WAC R6/239/2, Minutes of meeting held on 29 May 1964, and subsequent minutes.

2 WAC R6/239/1.

2 Within the framework outlined in 1 above, to tell the story of the interventions which led ultimately to the founding of the Science Consultative Group.

3 Using a range of scholarship, to interpret the events in 2 above in terms of deeply seated 'territorial' claims and oppositions.

The meaning of item 3 at this stage is not transparent, so I will give a brief example of the kind of work encompassed by it. Many scholars have seen popular science communication as a way for the scientific world to construct authority in a pragmatic way (as discussed in Chapter 1). In this thesis I want to argue that something more thoroughgoing was attempted: scientists sought a reorganisation within in the management of the BBC which would embody scientific authority structurally. Scientific managers were to be appointed to assume control of scientific broadcasting. To leave the analysis there, however, would be to ignore the other party to the opposition, namely the BBC. The BBC's response requires interpretation just as much as the scientists' interventions do. Here I turn to ideas of professionalism, the professionalism of broadcasters, and ideas of professional autonomy, as discussed in Chapter 2. I want to show that the differing positions from which scientists and broadcasters argued their positions skewed their interpretation of the nature of the dispute. The founding of the Science Consultative Group did not ultimately resolve these differences, although it served as a pragmatically useful body for both sides.

The brief example in the last paragraph is intended to show that a mode of analysis is used that looks to appropriate bodies of work against which to interpret the actions of the two major groups in this story, the scientists and the broadcasters. The intention of the thesis is to give theoretical groundings to the actions of both the scientists and the broadcasters.

The story of the long running disagreement between the world of science and the world of broadcasting is buried in archive documents, principally at the BBC, and is largely unknown and unpublished – although isolated episodes have appeared in dissertations, articles or book chapters.[3] Indeed, the field of science broadcasting in the UK as a whole has been little documented.[4] The standard general histories of

[3] Episodes from the story recounted here have appeared in Boon (2008), Friday (1974), and in the MSC dissertations of Le Masurier (1997), Nichols (1997) and Desmarais (2004).

[4] Research on science broadcasting in the USA has begun: LaFollette (2002a, 2002b, 2008)

British broadcasting by Asa Briggs,[5] Burton Paulu,[6] and Paddy Scannell and David Cardiff[7] have almost nothing to say about science broadcasting; and although specialist historical studies have dealt with particular parts of the BBC's output, such as music,[8] literature,[9] natural history[10], the only historical article concerning radio science broadcasting in the UK appears to be Friday's 1975 article on the Braggs and the BBC.[11] Similarly, the considerable body of book-length memoirs published by former BBC staff has virtually nothing to say about science broadcasting.[12] This thesis therefore also contributes considerably to the barely begun field of historical studies of science broadcasting.

In science and technology studies, although science communication and the public understanding of science are of particular interest, the emphasis of existing scholarship has been on print, and to a lesser extent cinema and television.[13] In so far as broadcasting has been investigated, the emphasis has been on the ways broadcasting media handle topical science issues – in other words science as a subject for journalism, current affairs and public policy.[14] This thesis by contrast is concerned with science as part of the standard fare of planned, scheduled broadcast output.

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5 Briggs (1961, 1970, 1995a, 1995b and 1995c). Briggs (1995c, p. 467) mentions the setting up of the Science Consultative Group in passing, but the long-running dispute which led to its founding is not mentioned.

6 Paulu (1956) and (1981)

7 Scannell and Cardiff (1991).

8 Doctor (1999); MacKay (2000); Scannell (1981); Hendy (2000a)

9 Avery (2006)

10 Davies (2000); Cottle (2004).

11 Friday (1975). MSc dissertations on aspects of science broadcasting have, however, appeared, by Le Masurier (1997), Nichols (1997) and Desmarais (2004).

12 Bridson (1971, p. 319), a memoir by a firmer staff writer and producer from 1935 to 1969, pays compliment to BBC radio science producers Archie Clow, David Edge and Mick Rhodes. Lambert (1940, p.75) speaks highly of the work of 1930s science producer Mary Adams. Other memoirs by Eckersley (1941), Eckersley (1946), Gorham (1948), Grisewood (1968), Hibberd (1950), Maine (1939), Reith (1949) and Silvey (1974) say nothing about science broadcasting.

13 In connection with nineteenth-century and early twentieth century books and periodicals, Broks (1993, 1996) and Bowler (2006) have been mentioned already. Whitworth (1996), Mellor (2003), Turney (2008, 2009) and Bowler (2009) look at twentieth century and recent popular books. Lewenstein (2009) concludes that books continue to drive public discussion of science. Kirby (2008) and Boon (2008) look at science in, respectively, cinema feature films and documentaries. Studies of non-journalistic television science are not common: LaFollette (1982, 2002b and 2008) cover the US experience over a long historical period. Silverstone (1984, 1985, 1989) looks at the UK. Lewenstein (1995), p. 343, and Hansen (2009), p.112, refer to the paucity of studies of radio science.

14 For example Broks (2006); Bucchi (1998); Bucchi (2004); Erickson (2005); Fuller (2005); Gregory and Miller (1998); Lewenstein (1995); Sismondo (2004);. Exceptionally, Holliman *et al.* (2009b, pp.178–92) has a short chapter by a former BBC radio science producer, Martin Redfern (Redfern, 2009). However (and perhaps ironically) its focus is strongly journalistic. Murcott (2010) gives a practitioner's overview of how various types of science broadcast are produced for aspiring science braodcasters.

Broadly speaking, the scientific critics of the BBC were associated with the British Association for the Advancement of Science and other less prominent bodies such as the Association of Scientific Workers (ASW) and the Department of Scientific and Industrial Research (DSIR). The scientific critics from these bodies held that science should be privileged in the BBC's output, and that scientists should have a controlling influence over what was broadcast. The meaning of 'privileged' in relation to the BBC's output will be clarified, but essentially it means that science would be favoured relative to other areas of broadcasting, such as sport or drama, by having its own department and manager. The case for privileging science was explicitly based on the need for the public to understand science better.

Exploring the long-running disagreement between the BBC and critical scientific institutions requires a good deal of theoretical and historical background to be supplied. This is done in Chapters 1 and 2. Chapter 1 is concerned with concepts and theories of science and science popularisation. Chapter 2 turns the spotlight on the BBC. It looks at the nature of professions, and at professionalism within the BBC. It then examines the history of the BBC, its constitutional position, and some of the scholarly work relating to the BBC and broadcasting. The story of the scientific interventions themselves is told chronologically in Chapters 3 to 6. This part of the thesis is based in the main on unpublished archival material.

It is necessary to point out areas largely excluded from the thesis. Television science, and science broadcasting outside the UK are hardly touched (although a brief discussion of science broadcasting in the USA is included in Chapter 3). The controversies discussed here for the most part date from a time when radio was the principal broadcasting medium in Britain. In fact, for much of the period covered by this thesis, television in the UK was either non-existent or a minority interest. Nor am I concerned with science in news broadcasts or schools broadcasts. News and Schools output were handled by entirely different BBC departments from the one that handled the mainstream science broadcasts that are at the heart of this thesis. Another area largely untouched is the relationship between the scientific interventions at the BBC and trends in national science policy. The policy context of science has been shown to be a key driver for popularising activities by scientists.[15] However, in this thesis, I am less concerned with the triggers for scientific intervention than with the form scientific interventions took and their outcomes. Nevertheless, I do discuss the wider social and scientific context of scientific interventions at the BBC as they occur.

[15] Gregory (2003), p.131

Media studies conventionally investigate the mass media from four points of view: history, texts (that is, media products of all kinds, not just print), production and audiences.[16] Although this thesis does not sit squarely within media studies, this four-way classification gives a useful framework for locating this work. In relation to this classification, this thesis is firmly situated within 'history'. Curran refers to historical research in media studies as the discipline's 'neglected grandparent',[17] and Bailey writes of the tendency of media scholars to live 'in a perpetual state of historical amnesia.'[18] This thesis attempts a restoration of a part of this lost historical memory. Again in terms of the four-way classification, this thesis also belongs to some extent in the 'production' category in so far as it concerns the practices of producers and managerial decisions that affected them. Concerning 'texts' and the construction of meaning from them, the thesis has little to say.[19] In most cases the content of broadcasts in the period concerned is unknown, though it is not necessarily unknowable for, despite the paucity of audio recordings for most of the period covered, text transcripts were made of many broadcasts and await investigation. Similarly the thesis has little to say about audiences and their reception (in a semiotic sense) of broadcasts.

Throughout the thesis, schedules of radio broadcasts from *The Times* are reproduced as illustrations. These are not intended to show any specific point, but taken together they reveal shifting patterns in the nature of the services offered by the BBC.

Use of archive material

The primary sources used in Chapters 3 to 6 of this thesis are mostly at the BBC's Written Archives Centre at Caversham, near Reading. Other archives were also consulted. In the 'References' section at the end of this thesis, the note on 'Archive sources' says a little about all the archive sources consulted.

Little archive material survives from the earliest years of the BBC, when the organisation was a private company.[20] At that stage record keeping was not centralised and systematic. A more disciplined approach to document filing was introduced in 1927, with the creation of large, centralised filing registries modelled on those used in the Civil Service.[21]

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16 Gillespie and Toynbee (2006), p.vii.

17 Curran (1991), p.27.

18 Bailey (2009), p. xx.

19 'The act of consumption always entails the production of meaning.' Stevenson (2002), p.89.

20 Kavanagh (1992), p. 341.

The BBC Written Archive was not created for the benefit of historians, but as a form of institutional memory. Documents in the archive need to be interpreted with care. What survives is often incomplete. Important episodes can be completely absent. Where documents do survive, they might have been preserved to represent a particular point of view. What is more, the interpretation of a document at the time of its writing might have been different from the ostensible meaning of the document now. For example, contemporaries might have seen irony that modern readers miss. Over and above these considerations, crucial exchanges might have taken place not on paper but in corridors or pubs, on buses, on the telephone, or in unminuted asides at meetings.

As strategies for dealing with such issues, no single technique can be cited, but several procedural factors can be mentioned. First of all, the substantial historical points made in this thesis do not depend on single isolated documents which carry a large evidential burden. Instead they arise from relatively long exchanges of documents as events unfolded. In such cases it is often possible to tell whether documents are missing, and sometimes it is possible to infer at least something of what missing documents, or informal exchanges, must contain. Also, in exchanges of documents, how statements are interpreted by recipients is often revealed in their responses.

Sometimes the contents of documents can be cross checked against other sources. This is relatively easy if, for example, a document proposes that a series of six talks on a particular subject be broadcast the following autumn. Whether such talks actually took place can be checked by consulting *Radio Times* or daily newspapers.

[21] Kavanagh (1992), p. 341.

Chapter 1
Construction, authority and popularisation

1.1 Internalism, demarcation and authority

As mentioned in the Introduction, the concepts of authority and autonomy recur in this thesis. My discussion of scientific authority in this chapter approaches the subject from two different viewpoints: internalist and externalist. These viewpoints are elaborated at greater length in the following sections. I want to consider these two points of view because of their relationship to the notion of authority. Briefly, though, 'internalist' accounts of science take the methods of science, and its epistemological content (its laws and empirical findings), as the source of scientific authority. The internalist approach is associated with traditional histories and philosophical examinations of science, which see science as progressively uncovering truths about the natural world. The externalist viewpoint, on the other hand, sees external factors (principally sociological factors) as the source of science's authority. From this viewpoint, science's authority is constructed through interaction between scientists and other groups and professions within society. In this section I will look more closely at the internalist position (or, rather, positions), and in the next section at externalist positions.

The internalist view of science is grounded in a normative demarcation of science from non-science; or it may grounded in the demarcation of better theories from worse theories. Fuller says that internalist approaches rest on the idea that science develops 'according to an internal dynamic that is relatively unaffected by changes in the larger social environment.'[1] From this point of view, sociological considerations have little bearing on the content of science. Gillispie sums this up as follows: 'science, which is about nature, cannot be determined in its content by the social relations of scientists.'[2] The exclusion of social factors is the point I want to stress here.

For logical positivists (for example, Rudolph Carnap, Otto Neurath and Alfred J. Ayer), who were not a specifically scientific movement but admired science, meaningful statements (of all kinds) were distinguished from meaningless ones through their verifiability. That is, for meaningful statements, there were procedures available that would establish whether they were true. If there were not such

[1] Fuller (2007), p. 3.

[2] Quoted in Porter (1990), p.36. The terms 'internalist' and 'externalist' (which are elaborated further below) correspond closely to some authors' use of the terms 'essentialist' and 'non-essentialist' (for example Gieryn, 1995, Wynne, 2008, and Locke, 2002)

procedures, the statement could not be regarded as meaningful. This philosophical demarcation was modelled on a view of scientific demarcation. In science, at least at the time of the logical positivists, verifiability in science was regarded as an empirical matter.[3]

For Popper, somewhat later than the logical positivists, the distinction between science and non-science lay not in verifiability but in falsifiability. In science, claims were always open to empirical falsification, and science's willingness to subject itself to trial by disproof differentiated it from non-science.[4] For Lakatos, unlike Popper and the logical positivists, the demarcation issue was one of appraising competing research programmes, and demarcating the better from the worse. In Lakatos's view, the demarcation of science from non-science was a special case of the demarcation of better programmes from inferior ones.[5] Lakatos sought to reject programmes not because they were falsified but because they were less fruitful than more progressive programmes, which would gain ascendancy.[6]

A different approach to the normative demarcation of science was taken by Robert Merton. Unlike the logical positivists, Popper or Lakatos, he was not concerned with the logical underpinning of scientific laws, but with:

> 'the *mores* with which [the methods of science] are hedged about.'[7]

Merton identified norms which applied to the conduct of scientific research, which he conceived abstractly. His norms were:

> universalism – the truth claims of science are independent of the personal or social attributes of their protagonist;
>
> communism – scientific findings are arrived at collaboratively and held in common;
>
> disinterestedness – the institution of science is not directed at any purpose other than the advancement of knowledge, notwithstanding the actual motivations of scientists which might be otherwise directed;

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3 Fotion (1995).

4 Popper (1959).

5 Lakatos (1978) p.107. However, for Popper non-science was a different category from science, not an inferior form (Kneale, 1974, p. 206).

6 Cartwright (1995).

7 Merton (1973), pp. 267–78

organised scepticism – science does not accept limitations imposed by authority or institutions.[8]

As a social scientist, Merton might seem to belong with the externalists rather than the internalists. However, the normative, universal nature of his characterisation put him in the internalist camp.[9] Merton took for granted the content of successful scientific work. His sociological account did not attempt to argue for knowledge as a social product.[10]

All the positions on demarcation outlined above have the internalist character. They examine the internal processes or logic of science in order to isolate its unique character. However, establishing universal criteria of demarcation of the kind enshrined in internalist accounts has proved intractable. For example, the empirical verifiability demanded by the logical positivists is not always feasible.[11] Popperian falsifiability turns out to be hardly less problematic,[12] because disproof is a matter of judgement, and disputants can continue to disagree for as long as they have the resources to do so.[13] To conclude that a hypothesis has been disproved is to invoke implicitly criteria related to judgement that are not contained within the Popperian account of science itself. Similarly, the interpretation of Lakatosian progression is itself a matter of judgement.[14] As for Merton's norms, part of their difficulty lies in their neglect of scientific practice.[15] For example, scientists are not actually expected to be disinterested in the pursuit of their research. Merton's norm of 'disinterestedness', in an unclear sense, lies in the institution of science itself rather than its practitioners.

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8 Merton (1973) p. 204.

9 Fuller (2006), p. 15, considers that Merton's norms were arrived at simply by surveying the 'methodological pronouncements of distinguished scientists and philosophers,' rather than by surveying what scientists did in practice. A danger with all attempts to demarcate a profession by listing associated traits (such as Merton's norms) is one of accepting professionals' own definitions of themselves. Furthermore, it is an ahistorical approach, as it takes no account change through time, and is atheoretical, as there is usually little or no attempt to establish a theoretical relationship between the traits. (Johnson, 1972, p. 25–6).

10 Rouse (1993) p. 59. Restivo (1995, p.99), however, considers Merton's internalism to be not rigorous, because Merton theorised that science's immanent development was to some extent conditional on the form of society.

11 Olby *et al*. (1990) p. 843.

12 Collins and Pinch (1982), p.134; Collins (1975).

13 Golinksi (1990), p. 494.

14 Ruben (1998), p. 463.

15 Fuller (2007), p.44.

Demarcationism based on an internalist approaches, such as those outlined above, presupposes articulated, universal standards of truth and valid inference.[16] The existence of such standards, on this view, ensures that demarcation remains independent of personal beliefs. That is, whether a theory is or is not scientific is independent of whether it is held to be scientific (or not scientific) by certain people. The relevant question when determining the scientific status of a theory is 'merely' whether it meets the standard set by the criterion of demarcation. In principle, the right to judge whether a theory satisfies the demarcation criterion is open to anyone. It is not the exclusive preserve of an élite of scientists or administrators.[17]

Demarcationism in its various ways, marks out science as a distinct area of intellectual enquiry and discovery, separate from society. It marks science as special because science uniquely satisfies the demarcationist criteria. The criteria guarantee a special quality in science. The authority of science lies in the special procedures by which science arrives at its accounts of the natural world; its authority is not rooted in the beliefs, judgements or opinions of scientists (or other people). Scientists are, in a sense, answerable in 'open court' (in principle, at least) for their judgements about scientific theories. In the words of Fuller, it's a view in which 'science is much too important to be left to scientific discretion'.[18] Science, then, in a demarcationist or internalist account, is 'open' in the sense that criteria of demarcation are open for all to inspect, and not related to social conditions, pressures or circumstances.

1.2 Externalism and elitism

An alternative to the normative, demarcationist view science outline in the last section is the externalist approach, which is an umbrella term for several schools of thought. What they share is a focus on the scientific community itself as the locus of scientific authority, rather than the logic of science. An example is the physical chemist Michael Polanyi, for whom an essential aspect of the scientist's craft was 'personal knowledge', encompassing practical skills and nonverbal communication.[19] Polanyi thus saw scientific knowledge as locally situated, tacit knowhow, which could not be directed to specified ends, for example social ends.[20] Polanyi maintained this position in opposition to a prevailing trend in Britain in the 1930s, among mainly

[16] Lakatos (1978) p. 108.

[17] Lakatos (1978) p.109.

[18] Fuller (2003), p. 45.

[19] Polanyi (1958).

[20] Rouse (1993), p.61. Polanyi's views about the tacit dimension of knowledge applied to all personal knowing, not just to science (Ray, 2009, pp. 75–6.)

left-wing scientists, that science should be directed towards socially useful ends.[21] Polanyi's view was that only scientists themselves could judge how science should develop. This is markedly different from internalist positions where criteria for scientific advancement are stated openly. In this sense, Polanyi's stance on scientific knowledge is non-normative. Lakatos puts him in a camp which he terms 'elitist'.[22]

In Lakatos's classification, elitists (like demarcationists) acknowledge that science progresses. For example, elitists can acknowledge that the scientific work of Newton is an advance on what preceded it. However, elitists hold that only scientists can adjudicate on progress, because there can be 'no statute law to serve as an explicit, universal criterion (or finite set of norms) for progress or degeneration.'[23] Elitists, therefore, assert their authority by reserving to themselves, or to a wider scientific community, the right to adjudicate on scientific matters.

The elitist category, for Lakatos, also includes Thomas Kuhn, who observed that the paradigm shifts of scientific history cannot be explained solely by reference to the rational and empirical processes usually advanced in internalist science histories.[24] The adoption of a new paradigm in science, Kuhn found, should be understood as a psychological and sociological phenomenon. In Fuller's characterisation of the paradigm shifts identified by Kuhn: 'the essence of Kuhn's *Realpolitik* of science [is that] scientific revolutions succeed not because the same people are persuaded of a new way of seeing things (*à la* Popper) but because different people's views start to count.'[25] That is, the revolution succeeds because different people command authority. A new élite emerges.

In contrast with normative demarcationism, elitism sees science as self-organising, self-policing, and not required to account openly for its judgements. Fuller characterises it as follows, in a précis of Kuhn's view of 'normal' science: 'For [Kuhn] an activity is not a proper science unless the community of inquirers can set its own standards for recruiting colleagues and evaluating their work.'[26]

The elitist view of science, for Fuller, is not simply an analytical standpoint identified by historians and commentators such as himself. Fuller says elitism

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21 McGucken (1984), p. 300.

22 Lakatos (1978), p.111.

23 Lakatos (1978), p.111.

24 Kuhn (1970), p. 77.

25 Fuller (2003), p. 37.

26 Fuller (2003), p. 45.

actually characterises the way scientists have operated where science and public policy meet:

> Western national science policy makers [...], since the end of world War II, have presumed that self-organising bodies of scientists, roughly corresponding to academic disciplines, can determine the best researchers and research, and need change course only when they see fit.[27]

Elitism, then, is associated with scientific autonomy, and with the creation and exercise of authority. An elitist view of science regards scientists as uniquely empowered, and indeed entitled, to decide on matters of science, and on matters of science policy. To quote Fuller again, 'Science is whatever scientists do'.[28]

In Kuhn's wake has come a large body of work concerned with the activities of scientists themselves, seen from a sociological point of view.[29] In this work, the creation of scientific knowledge itself is seen as being amenable to sociological examination.[30] Scientific knowledge is viewed as constructed through an interplay of factors, with special significance attached to sociological factors. More particularly, this approach seeks sociological explanations for phenomena that were hitherto regarded as not requiring explanation, or as self explanatory. Bloor, for instance, draws attention to the way, in Popper's writings, the scientific community is said metaphorically to 'accept' certain statements as fact, or it is said to 'decide' on the status of other statements. Even metaphorical acceptance and decision, Bloor observes, call out for psychological and sociological examination. In internalist accounts, however, empirical data is often seen to entail a particular scientific interpretation in a straightforward way that requires no explanation:

> Too easily, ... 'decisions' can be construed as points rather than as processes; as things without structure or history; as momentary events. Seen in this way they can function as discontinuities, which terminate enquiry.[31]

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[27] Fuller (2003), p. 46.

[28] Fuller (2007), p.12. In contrast, Fuller gives a similarly terse characterisation of demarcationism: 'A presupposition of the demarcation project ... is that science is not necessarily identical with what the majority of accredited scientists say it is.' (p.36).

[29] For example Collins (1974); Collins (1985); Collins and Pinch (1993); Gilbert and Mulkay (1984); Knorr-Cetina (1981); Latour (1987); Latour and Woolgar (1986); MacKenzie and Wajcman (1992); Shapin and Schaffer (1985); Woolgar (1988).

[30] Barnes (1990), p. 64. Kuhn's status as a founder of the modern sociological conception of scientific knowledge is ironic as his theoretical work was intended as a contribution to internalist history of science (Restivo, 1995, p.100).

[31] Bloor (1991), p. 64–5.

An internalist approach, then, is apt to leave much unexplored and undiscussed. Scientists are regarded as 'compelled by beliefs and standards.'[32] By contrast, a post-Kuhn sociological approach tries 'to understand why they [scientists] accept those beliefs and standards, and employ them in the way that they do.'[33] However, and more relevantly for this thesis, the sociological approach to scientific knowledge also widens the field of enquiry beyond scientists to include, for example, funding bodies, media organisations, popularisers and the public.

1.3 'Science and society': the social relations of science movement

Sociological examinations of science did not start with Kuhn. Prior to Kuhn, however, they tended to take the processes of science for granted and to look for influences of science on society or the influence of society in directing scientists to particular areas of enquiry. I term this the traditional 'science and society' approach to the sociology of science.

In the traditional 'science and society' sense, the study of science from a social point of view dates from the seventeenth century and the work of Francis Bacon.[34] For a succession of later thinkers, including Henri de Saint-Simon, Auguste Comte, Ernst Mach and Karl Pearson, science offered models, or even techniques, for the conduct of life. Turner refers to this exemplary conception of science as 'extensive'.[35] In the extensive conception of science, science is understood as being applicable beyond its normal subject matter. Another example of an extensive view of science is the advocacy of 'scientific method' in social issues.

The extensive conception can be seen to have been associated historically with a progressive view of science. Schemes to ameliorate social problems through restructuring of society along 'rational' lines have generally been informed by an extensive conception of science. The statistician and eugenicist Karl Pearson, for example, considered that through education of the public in, and popularisation of, science, a consensual politics would emerge, to the wider benefit of society.[36]

The extensive conception of science is evident in a number of social trends that played out in the background to events described in this thesis. In the 1920s and 30s,

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32 Barnes and Shapin (1979), p. 187.

33 Barnes and Shapin (1979), p. 187.

34 Turner (2008), p.33; Nielsen (2008), p. 173.

35 Turner (2008), p. 39.

36 Turner (2008), p. 39.

many left-leaning British scientists (notably John D. Bernal, John B. S. Haldane, Lancelot Hogben, Hyman Levy, Joseph Needham and Patrick Blackett) considered that science was underutilised in public life. For example, J. D. Bernal argued for the political management of science for beneficial ends in his 1939 book *The Social Function of Science*.[37] P. M. S. Blackett wrote of science's unexploited capacity for remedying social ills:

> Industry and science have made such huge advances that a large improvement in the standard of life, particularly of the workers, is now technically and immediately possible.[38]

The scientists mentioned in the last paragraph, and many others, became associated with the social relations of science movement, which was concerned with the betterment of society through science. The movement's origins have been traced to the First World War, and a disenchantment with science that spread widely in the public and, to some extent, among scientists themselves, as the destructive potential of science became evident.[39] The heyday of the social relations of science movement was the 1930s,[40] and many scientists associated with it looked to the USSR as a model of what rationally organised, centrally planned administration could achieve.[41] Conversely, Nazi Germany provided an example of what an anti-scientific spirit could lead to. In 1934, Blackett said:

> The National-Socialists have been led by their belief in a racial theory to eject very many of Germany's ablest scientists. [...] And this development is no accident. It is a part only of a larger movement, and the larger movement is essentially anti-scientific.[42]

For many scientists and commentators associated with this movement, what stood in the way of the proper use of science for social betterment were vested interests and reactionary forces.[43] If the social potential of science was to be realised, the public must be made aware of what science could offer – through popularisation. Popularisation, then, served a vital role in the proper appreciation and use of science.

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37 Bernal (1939); Rouse (1993), p. 60.

38 Blackett (1935), p.129. This item began life as a BBC radio talk in 1934, and subsequently published as a book chapter.

39 MacLeod, R. and MacLeod K. (1976)

40 McGucken (1984)

41 Turner (2008), p. 44; Bucchi (2004), p. 15.

42 Blackett (1934), p.135–6.

43 McGucken (1984), p. 3 and Bernal (1939), p.305.

Bernal wrote that if the potential of science for benefitting human welfare were 'drummed into' people, the demand for science to be used in this way would become irresistible, to the displeasure of the 'vested interests of owners and advertisers.'[44] Scientists associated with the movement were inclined to turn to popular media to promote their ideas about the social benefits of science and planning.[45] Popular understanding of science thus became an urgent necessity, and Bernal, in particular, was complimentary about the work the BBC had done.[46]

Scientific discontent with the non-exploitation of science in public administration was not new in the 1920s and 30s. Similar discontent could be found in the second half of the nineteenth century.[47] What distinguished the social relations movement of the 1920s and 30s, though, was its predominantly left-wing political stance, and its ambitions towards the use of science for radical social improvement.[48]

In the USA, social utility as a criterion of support for scientific research was favoured by the Rockefeller Foundation, which, in common with other foundations, held that human welfare was best served by 'the systematic and rational application of objective knowledge.'[49] The Foundation's conception of science was broad, encompassing the whole of organised knowledge. Within this extensive conception (in Turner's meaning, given earlier), the social sciences were valued for their potential in the creation of a 'rational social order'.[50] The Director of the Rockefeller's Natural Sciences Division in the 1930s and 40s, Warren Weaver, who was inspired by an idealistic vision of a well managed society,[51] became in effect one of the first scientist-entrepreneurs, managing the Foundation's research by selecting and devising projects according to a scheme of his own devising. The patronage of the Rockefeller's Natural Science's Division under Weaver was not restricted to the USA.[52]

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44 Bernal (1939), p.305.

45 McGucken (1984).

46 Bernal (1939), p.305.

47 Turner (1980) p594.

48 Turner (1980), pp. 607–8.

49 Kohler (1976), p. 280.

50 Kohler (1976), p. 281.

51 Kohler (1976), p. 280.

52 Abir-Am (1988) describes applications to Weaver and the Rockefeller Foundation for funding by the British biochemist Joseph Needham in 1935–7. Needham's applications were largely unsuccessful. Abir-Am shows the extent to which personal and 'externalist' factors bore on the funding decisions by Weaver in this case.

In 1931, arguments that the causal relationship between science and society actually ran from society towards science, and not the other way round, were presented by the Russian delegation at the Second International Congress on the History of Science in London. Russian physicist Boris Hessen presented a paper describing the social and economic roots of Newton's *Principia*.[53] Reflecting on this congress in the 1970s, science journalist and populariser James G. Crowther (generally known as J. G. Crowther), who worked behind the scenes to bring the Soviet delegation to London,[54] said that the notion of a scientific development having social or economic roots came as a revelation to British scientists attending the congress. 'After Hessen, the obvious first task was to interpret British science from the social and economic point of view.'[55] This project was not adequately accomplished according to Porter, who charges Bernal's 1939 book *The Social Function of Science* with 'merely juxtaposing the successive phases of science alongside parallel, but essentially unconnected, accounts of economic, political and social changes.'[56] For Porter, the approaches of Hessen and Bernal were not really, or not sufficiently, externalist. They were 'not a new dawn but a dead end' because they did not unpick the way social factors bore on the creation of scientific knowledge itself, but rather on the kinds of research activities that scientists pursued. Restivo makes a similar point: 'What stands out about the period of the 1920s and 1930s, by contrast with the late twentieth and early twenty-first centuries, is the resistance to bringing social, historical and cultural perspectives to bear on the content of science; on scientific knowledge itself.'[57] Although, in relation to the sociology of science, the approaches of Hessen, Bernal and others may have been a 'dead end', the social relations of science movement is of considerable historical interest in relation to the popularisation of science,[58] and is pertinent background to the historical part of this thesis.

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[53] The complex circumstances of Hessen's composition of this paper are related by Graham (1985). Hessen was a practising physicist who esteemed Einstein's theories of relativity, as well as Newton's work. However, the bourgeois backgrounds of Newton and Einstein, and the bourgeois ideologies that, in the USSR, were held to have informed their work meant that overt approval was dangerous – especially where Einstein's work was concerned. Hessen chose to talk about Newton in London because he knew it would gain attention and because he hoped to show that one could value the cognitive content of science independently of the social context of its creation. In this way, support for Einstein in the USSR could be framed as compatible with loyalty to the Soviet enterprise. Hessen's strategy did not succeed in the way he hoped. He was arrested in 1936 by the NKVD on trumped-up charges of being a member of a counter-revolutionary terrorist organisation and executed (Chilvers, 2003, p. 433)

[54] Chilvers (2003) p.422.

[55] Crowther (1972).

[56] Porter (1990), p.34

[57] Restivo (2005), p. xi.

[58] McGucken (1984).

1.4 Gieryn's boundaries

One of the tasks of an externalist account of science is to explain the authority of science within society (rather than, for example, simply among scientists). Gieryn has proposed a metaphorical way of thinking of how scientific authority is constructed socially, through the actions of scientists and their interaction with non-scientists.[59] In Gieryn's accounts, which draw on ideas from the sociology of professions, discussed in Chapter 2, the demarcation of science in practice is achieved not by adherence to explicit, internalist criteria but through 'boundary work'. Boundary work occurs as people 'contend for, legitimate or challenge the cognitive authority of science – and the credibility, prestige, power and material resources that attend such a privileged position.'[60] Gieryn's work thus belongs to a pragmatically based branch of social science in which interactions between people are seen as the cause of social structure.[61]

The 'boundary' that Gieryn refers to is the boundary of science. Science is metaphorically understood to be a zone on a map of intellectual terrain, with a boundary marking it off from other activities, for example engineering or religion. What lies within the boundary is not given any structure by Gieryn, but the border delineates science, just as the border of France on an atlas represents the geographical, cultural and political entity of that name. Science, for Gieryn, is differentiated from non-science through the outcome of a vast number of resolutions of local border disputes. In these neighbourhood treaties (which need not be neighbourly), one side is victorious in a claim to be scientific. To be scientific is to claim cognitive authority. In Gieryn's analysis, the demarcation of science thus becomes the exercise of scientific professional authority, rather than an appeal to an independent standard of demarcation (for example, Popperian disproof).

The relevance of Gieryn's metaphor to this thesis arises from the many ways in which boundary work is accomplished. For example, boundary work is done by scientists when they represent science to other contingent groups (e.g. administrators, fund holders, journalists or social scientists). Other forms of boundary work include expelling maverick figures, or refusing admission to dubious supplicants. Boundary work is how authority is created, rather than in 'upstream' activities such as working at a laboratory bench or testing a hypothesis.

In relation to Gieryn's metaphor, science popularisation is one type of boundary work. It is a way of advertising the existence and location of a boundary, and a way

[59] Gieryn (1995), (1999)

[60] Gieryn (1995), p. 405.

[61] Maines (1993), p.xiv.

of ensuring that as many people as possible understand who occupies the sites of epistemic authority, and how far the site extends. Mellor has elaborated this process in relation to popular science books aimed at general readers. She refers to the work done by popular expositions of science as 'routine boundary work' to distinguish it from journalistic investigations or news items.[62] The popular science books in question are categorised by Mellor as 'expository'. In expository popularisations, the author tells a story of an episode from the history of science, or outlines the current scientific interpretation of a phenomenon, and their educational orientation is "enfolded in a rhetoric of 'accessibility'".[63]

Kohler finds that Gieryn's metaphor is too much influenced by an accident of history. National boundaries may now be narrow, well defined lines, but they were not always like that. The clear boundaries of modern geography are a recent invention, devised for their legal and political utility.[64] Typically, through most of history, a frontier between states was established by custom and practice, and often took the form of a broad border where a mixed or hybrid culture evolved. This type of border was usually a region of intense administrative, commercial and social activity, and populated by residents who served a transient, non-resident population. Kohler's point here is to warn against thinking of metaphorical boundaries too much as discontinuities. In fact they may be regions of transition, characterised by permeability and overlap. This image of a permeable border is also captured in Wenger's concept of periphery around a 'community of practice', discussed in Chapter 2.[65] I shall use the term 'border' to represent this Kohlerian idea of a somewhat permeable zone between groups and activities.

1.5 Science communication and popularisation

Gregory points out that one of the factors that distinguishes modern science from its pre-scientific forerunners (such as alchemy and necromancy) is communication. Modern science, in principle at any rate, is not inherently secretive. Openness and candour are inherent in Merton's norms of scientific conduct.[66] Furthermore, in earlier centuries the public had a role as witnesses of scientific experiments.[67]

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62 Mellor (2003) p.510.

63 Mellor (2003) p.516.

64 Kohler (2002), p.12–19.

65 Wenger (1998), pp. 118–20.

66 Gregory (2009), p.5.

67 Shapin and Schaffer (1985); Feher (1990)

Much scholarly work in science communication has been concerned with communication within the scientific world, seeing this it as part of the process of knowledge creation.[68] However, scientific authority itself, as Sismondo observes, derives largely from popularisation – that is, from communication between the scientific world and the public. Without popularisation, science would be 'a much more marginal intellectual activity than it is'.[69] Popularisation, therefore, is one way in which the authority of science is asserted within society at large.

According to Kuhn pre-paradigmatic science, or revolutionary science, at least in the past, tended to be expounded in books that were comprehensible to any well educated reader with an interest in the subject.[70] Examples are Benjamin Franklin's *Experiments and Observations on Electricity* and Charles Darwin's *On the Origin of Species*. A characteristic of 'normal', or paradigmatic, science, though, is that the exposition of the elementary concepts becomes the province of text books. Scientists within the paradigm conduct research at the point where the textbooks leave off, and their research communications are directed to other scientists within the paradigm. These research communications are necessarily esoteric, and for Kuhn, a widening gulf between the language of research and everyday language is intrinsic to scientific advance.[71] In mathematics and astronomy, according to Kuhn, the gulf was already a chasm in antiquity. In electrical research, the gulf had opened before the end of the eighteenth century, and in most physical sciences, during the nineteenth century.

In the nineteenth century, an increasing professionalisation of science[72] and an expansion of science popularisation to some extent crystallised the idea of a gap of comprehension between scientists and the public.[73] Much of this popularisation used traditional media, such as public lectures, demonstrations, exhibitions, and museum displays.[74] However, science became a staple of the new mass-circulation print media.[75] The expansion of popular publications (on all subjects) in the mid- and late-nineteenth century was fostered by developments in the book trade in the 1820s and

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68 For example, Gilbert and Mulkay (1984); Latour and Woolgar (1986); Knorr-Cetina (1981).

69 Sismondo (2004), p. 165.

70 Kuhn (1970), p. 20.

71 Kuhn (1970), p.21.

72 Broks (2006), p.28.

73 Bensaude Vincent (2001), p. 105.

74 Fyfe and Lightman (2007b), pp. 5–9.

75 Lightman (2007).

1830s, specifically changes to intellectual property rights, which opened the publishing trade to entrepreneurial new entrants.[76]

The mid-nineteenth century saw the beginnings of *Scientific American* and *Nature*.[77] Popularisation of science, like many other public-service provisions and recreational activities of the Victorian era, was associated with ideas of democracy and responsible citizenship.[78] The nineteenth century also saw the growth of a British anxiety that science was insufficiently promoted. Britain, it was alleged, was falling behind other countries in science and engineering, and the population at large was insufficiently knowledgeable about science.[79] The founding of the British Association for the Advancement of Science in 1831 was partly a response to this diagnosis.

By the early twentieth century, popular science literature was notable both for its quantity and its diversity.[80] Authors of popular science could be high-ranking scientists, or scientists of little repute,[81] or professional intermediaries, such as journalists and popularisers. Science appeared in articles in many general interest periodicals.[82] As with the monograph publications, these articles were created by an extraordinary diversity of authors. Broks mentions the impossibility of typifying a science populariser of this period. Authors included:

> ...professional scientists and professional writers, together with a mix of clergymen, barristers and Members of Parliament. The list includes the editor of *Nature*, and a junior clerk at the meteorological office; the ex-governor of Borneo writing about the silk worm and a 32-year-old company secretary telling "the story of the field vole".[83]

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76 Topham (2007).

77 Bensaude Vincent (2001), p.103.

78 Jenkins (2006), p. 198; Turner (1980), p.596; Bailey (2007), p. 98.

79 Gregory and Miller (1998), p.23.

80 Bowler (2006)

81 Bowler (2006) has found that the early twentieth century was notable for a proliferation of popular science books written by scientists whose names are now virtually unknown. Often the authors were science lecturers at provincial universities.

82 Broks (1993).

83 Broks (1993) p.125. See also Broks (1996), pp. 14–27 for discussion of popular publications that featured science, and pp. 28–40 for discussion of authors.

The twin developments of the professionalization of science and the burgeoning publication of popular science titles served other functions than their ostensible ones.[84] Professionalisation was associated with the acquisition and protection of status for science, the assertion of scientific autonomy, and a claim towards cultural leadership for science.[85] Achieving cultural leadership for some sections of the scientific world meant displacing religion, and specifically the Christian metaphysical basis of society, and replacing it with secular rationalism. The popularisation of science assisted this purpose.[86] A professional turf war developed between the newly professionalised world of science and the world of religion over the leadership of British society.[87] The Victorian scientific world, however, was by no means unified in its antagonism to the cultural authority of the Church. Some scientists opposed the Church's authority (for example T. H. Huxley, Herbert Spencer and John Tyndall), but others were more conciliatory (for example, James Clerk Maxwell, William Thompson and Macquorn Rankine).[88]

Lightman highlights the difficulty of finding an appropriate term for the popularization of science in this period. Applying the concept of 'science popularisation' risks importing into the Victorian era a set of pejorative connotations that has developed around 'popular science' or 'popularizer of science' in the twentieth century.[89] However, as Lightman points out, retaining the category of 'popular science' does at least invite some pertinent questions: What did popularization entail? Who had authority to popularise? What was the relationship of 'popularisers' to practitioners in cases when they were different people?[90]

Coming to the twentieth century and early twenty-first century, anxiety – even 'moral panic' – about the public's perceived indifference to, and ignorance of, science, has not gone away.[91] From time to time it has flared into the public sphere, generally in the form of urgent manifestos for action to improve scientific literacy. For example, in 1928, the science journalist J. G. Crowther published *Science for*

84 Bensaude Vincent (2001)

85 Broks (2006), p.29, 31.

86 Broks (2006), p. 31

87 Broks (2006), p.31; Shapin (1990), pp. 996–7; Shapin (1982), p.172; Turner (1980) p. 591; Lightman (2007), p. 6.

88 Lightman (2007), p. 6–8.

89 Lightman (2007), p. 9.

90 Lightman (2007), pp. 9–13.

91 Fuller (1997), p. 1 refers to a sense of 'moral panic' pervading annual British Science Weeks, at which survey results of the public's scientific ignorance, or statistics of declining university enrolment for science courses, are apt to circulate.

You, in which he spoke of scientific knowledge as 'one of the necessities of the hour' for the public.[92] In March 1943, the British Association for the Advancement of Science mounted a conference entitled 'Science and the Citizen: the Public Understanding of Science' at which scientists Sir Henry Dale, Cyril D. Darlington and Douglas McClean, among others, urged the importance of inculcating in the public a knowledge of science.[93] Three years later, a joint British Association/Royal Society conference was held in October 1946 on 'The Dissemination of Scientific Information to the Public'.[94] In the USA, following the launch of the Sputnik satellite by the USSR in 1957, Hilary J. Deason, of the American Association for the Advancement of Science, wrote: 'Scientific literacy has become a real and urgent matter for the informed citizen.'[95] The following year, at the British Association for the Advancement of Science's annual meeting in August 1958, the President Sir Alexander Fleck drew attention to current scientific developments and lamented 'it is sad to think how few people clearly understand what it [science] is all about'.[96] In the 1980s, following the publication of the Royal Society report *The Public Understanding of Science*,[97] the Committee on the Public Understanding of Science (COPUS) was founded to support activities promoting science.[98] In 2004, the eminent scientist Lord May of Oxford said in a BBC Radio 4 interview that, 'No young person today can prepare adequately for life in an increasingly technological world without having a firm grasp of scientific reasoning.'[99]

Popular science, though, can work in a partisan way, promoting one branch of science at the expense of another. Erickson also finds that scientists writing popularisations often claim to speak on behalf of all science, and often freely generalise from the specifics of their own specialism.[100] Laetsch points out that a stock set of arguments tends to be advanced in claims for the benefits that increased popular scientific literacy will achieve. In order of priority, scientific literacy will:

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92 Crowther (1928), p. vii.

93 British Association for the Advancement of Science (1943). Presentations by Dale, Darlington, and McClean are reported in Dale (1943), p. 285–6; Darlington (1943), p. 300; McClean (1943), p.302.

94 British Association for the Advancement of Science (1946)

95 Deason (1957)

96 *The Times* (1958)

97 Bodmer (1985); unofficially known as 'the Bodmer report'.

98 Broks (2006), p.106.

99 May (2004).

100 Erickson (2005), p. 151.

cause the electorate to make better political decisions;

bring economic returns to the nation, because science and technology form the bases of modern society;

eliminate superstition and non-rational views;

change personal behaviour (for example, regarding diet and consumption of alcohol, tobacco);

make people more ethical.[101]

Laetsch finds all these claims questionable, and considers that they embody 'a high level of hubris.' That is to say, they assume that scientific literacy is 'the highest literacy.'[102] Nevertheless, despite the questionable nature of the claims made for science literacy, Laetsch considers there are good reasons for the public to be interested in science, but they are different from those the scientific world gives. They relate to the public's own curiosity and enthusiasms. These are demonstrated in hobbies and pastimes such as rose growing, bird watching, electronics, and so on.[103] In its own way, the public *is* interested in science, and often deeply knowledgeable about it.

Turner has observed that the 'top down' promotion of scientific literacy (that is, the kind of promotion driven by scientists themselves) is often motivated by reasons other than benefit to the public or the state:

> 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. [104]

Thus, in this account, science popularisation secures visibility and influence for science in society. In addition, it can establish science's spheres of competence, such as the social and economic, as well as defining science's place relative to other intellectual activities or social groups within society.[105] Thus science popularisation

[101] Laetsch (1987), pp. 3–7.

[102] Laetsch (1987), p. 3.

[103] Laetsch (1987), pp. 8–9. Laetsch's observations are broadly similar to those of Trachtman (1981).

[104] Turner (1980), p.590.

[105] Turner (1980), p. 590.

can be self-serving for scientists. In a similar vein, Gregory writes of the way that, especially in the post-Second World War period, institutional pressure for popularisation of science appears to be correlated with scientific grievances, such as scientists feeling their arguments are not appreciated by peers, or that respect and resources are denied, or that their institutions need promotion.[106] In the sociology of science, therefore, popularisation of science is seen a way of making a case for, or sustaining, the authority of science. Whitley also sees it as a way in which, in scientific controversies, one side or another mobilises support for its position,[107] and Mellor finds that popular expository science promotes a 'relatively unchanging conception of science despite the potential critiques of science which emerge from news coverage of controversial science.'[108] Among her conclusions is: 'The rhetoric of accessibility, and of the PUS [public understanding of science] movement more generally, serves to cover over the ways in which popular science texts promote the interests of scientists by reinforcing their epistemic authority.'[109]

The foregoing shows that science literacy, as a campaign objective, is widely regarded by sociologists of science as a trope deployed to enhance the status and influence of science. It is a means of exhibiting authority. Edgerton identifies another trope, deployed in much the same way by scientists: futurism. Futurism is an innovation-centred view of scientific and technological development promoted by the scientific world.[110] It interprets the story of science as one of scientific innovation rather than one of 'science in use' or 'technology in use'. According to Edgerton, the futuristic position overvalues the importance of innovation. It emphasises the uniqueness of the present, which is seen as unprecedented and ushering in a new era:

> We are told that change is taking place at an ever accelerating pace, and that the new is increasingly powerful. The world, the gurus insist, is entering a new historical epoch.[111]

The novelty of the new epoch becomes a way of promoting science, because the new epoch is always framed as being dependent of science and technology to an unprecedented extent. Edgerton does not deny that innovation happens. His point is

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106 Gregory (2003), p.131

107 Whitley (1985), p. 9: '... much popularisation of contemporary scientific knowledge is intended to gain wider social support for a particular position or approach within a scientific controversy.'

108 Mellor (2003), p. 518.

109 Mellor (2003) p.530.

110 Edgerton (2006b), p.ix. Many of the ideas Edgerton presents in this book were presented earlier in the paper Edgerton (1999), although the word 'futurism' is not used in that earlier paper.

111 Edgerton (2006b), p.ix

to draw attention to the sameness of the visions of the future that are associated with futurology, and the recurrence of these visions: '[T]he future is what it used to be; we go back to the future; we are now shocked by the old; the future is always the same, it is the past that changes.[112]

Futurism, Edgerton maintains, is inherently ahistorical. It is ignorant of its own history, which consists largely of the same stories being repeated:

> Take the extraordinary litany of technologies which promised peace to the world. Communications technologies, from railways and steamships, to radio and the aeroplane, and now the internet, seemed to make the world smaller and bring people together, ensuring perpetual peace.[113]

In fact the ahistorical nature of futuristic arguments is necessary if the arguments are to succeed. As Edgerton writes:

> In order to be at all convincing these arguments must deny their own history...[114]

Futurism, then, as construed by Edgerton, is another way of persuading the public and policy makers of science's unique importance in the modern world.

As described by Edgerton, futurism is, among other things, a process of forgetting the past, so that recurring claims about the future are not recognised as recurring. The anthropologist Mary Douglas, whose work is discussed in more detail on Chapter 2, observes that social institutions and cognitive processes of people within those institutions are locked together. In particular, she finds a connection between social order and institutional (or social) memory.[115] Developing Robert Merton's observations that the scientific world keeps forgetting that solutions to scientific problems have usually existed prior to their 'discovery', and that scientists are surprised and angered when their discoveries are shown to be re-discoveries, Douglas finds that the world of science has institutional amnesia. In science, rewards are allocated to accredited innovation, and the concepts of priority and discovery are embedded in scientific institutional life. The corollary is that science has efficient ways of eliminating from memory those earlier theories which were not constructed

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[112] Edgerton (2006a), p.337.

[113] Edgerton (2006b), p.xvi

[114] Edgerton (1999), p.128. As mentioned earlier, Edgerton does not use the word 'futurism' in his 1999 paper, but the arguments he mentions in the 1999 paper are of the same kind as those referred to as 'futurism' in Edgerton (2006b).

[115] Douglas (1986), pp. 70–2.

on the ‘current cognitive infrastructure’, even though such theories sometimes have value in relation to current problems.[116] Such amnesia is not dysfunctional. On the contrary, in a competitive social organization that prizes accredited innovation (as in science), institutional amnesia is highly functional.[117] The recurring futuristic claims identified by Edgerton can be seen as a manifestation of institutional amnesia.

1.6 The dominant model

Conventionally, among scientists, science popularisation is viewed as a process of simplification, and possibly distortion if carried out by non-specialists such as journalists.[118] Dornan has looked critically at this traditional view.[119] He identifies several assumptions made by scientists when they criticise science popularisation. Taken together, the assumptions identified by Dornan have come to be known as the dominant model of science communication. The dominant model, in brief, reflects how scientists typically view the communication channel from the world of science through to the lay audience. The assumed existence of a distinct ‘scientific world’ and a distinct ‘lay audience’, with a somewhat unreliable communication channel between them, is itself part of the dominant model. The model, then, helps to define the parties in communication process, and the relationship between them.[120]

Dornan identifies the dominant model in order to foreground the assumptions embedded in it, and to show how they construct scientific authority. In summary:

> The model sees science communication as a simple, one-way transmission model, in which the objective is to relay information with maximum fidelity to the original.
>
> Scientific messages need to pass through stages of simplification between their properly scientific incarnation and their popular incarnation.
>
> Epistemic authority lies at the ‘source’ end. This is where the authority lies to assess the accuracy of any re-fashioning of the scientific message for a particular audience.
>
> Science supplies assured knowledge.

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[116] Douglas (1986), p. 77.

[117] Douglas (1986), p. 76. An example of ‘rediscovery’ is the realisation of Duncan Black in 1948 that in a voting system a majority can prefer A to B, B to C and C to A, leading to the conclusion that a majority voting system does not necessarily allow an ordering to be arrived at. The discovery had been made at least twice before, but in societies with little interest in democratic voting. Hence it was forgotten. (Douglas, 1986, pp. 78–9)

[118] For example Farago (1976), p.10.

[119] Dornan (1990)

[120] Shapin (1990), p.992.

The audience consists of passive recipients of the message from the scientists (or journalistic intermediaries).

Although Dornan's findings were mostly based on research in print media, they are applicable to broadcast media. For example, the model identifies institutional pressures as inimical to the goal of 'proper' scientific exposition. Constraints of air-time, among others, are regarded by scientists as frustrating the goal of responsible coverage.[121]

Other studies have elaborated the ideological nature of the dominant model. Whitley concludes that popularisation is part of scientists' strategy for claiming intellectual autonomy.[122] Hilgartner shows how the dominant model plays to the interests of scientists using a case study based on health risks associated with smoking. He finds that ideas of scientific purity, accuracy and popularisation are deployed strategically by scientists in ways that serve their own interests.[123] These studies find that the dominant model promotes a particular view of a power relationship between scientists and non-scientists – a view which serves the interests of scientists.

When it comes to communication between scientists and other scientists, the usual channels are peer-reviewed journals and conferences. Cloître and Shinn develop a model of styles of scientific exposition as they relate to particular audiences.[124] When scientific ideas are confined to a particular specialism, they tend to be exposed in specialist publications associated with that field. For a wider audience, within the discipline, but outside the specialism, there are more general publications and channels. When ideas are absorbed into the pedagogy of a subject, there are textbooks and educational courses, and for mass consumption there are television documentaries and popular science articles in the press. The sequence given here also represents a trajectory by which ideas diffuse to progressively wider and less specialist audiences. However, the pattern is not inviolable, and what Cloître and Shinn refer to as 'deviations', when the trajectory is not followed, for example by omission of a step or steps, can have special significance.[125] Deviation can serve numerous purposes, such as allowing scientists to be more speculative than is possible within the constraints of the usual channels.

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121 Dornan (1990), p.54.

122 Whitley (1985)

123 Hilgartner (1990).

124 Cloître and Shinn (1985).

125 Cloître and Shinn (1985), p. 55

Buchhi has elaborated some of the strategic functions of deviant science communication, when scientists address the public directly – typically through press or television.[126] In such cases deviant science communication can be a coded message to other scientists, despite ostensibly being directed towards the public and despite the use of communication channels not normally associated with scientist-to-scientist communication.[127] This type of deviation might, for example, be used to establish priority when a new discovery has not yet been confirmed by others, or when findings have yet to traverse the official publication routes. Bucchi cites the example of Pons and Fleischmann's initial press conference regarding cold fusion, in 1989, intended, Bucchi says, to establish priority in the 'discovery'.[128] Besides being used to establish priority, deviation can promote ideas in a popular arena that are controversial in a specialist one. Bucchi cites the occasion of a BBC radio broadcast in 1950 for which Hoyle coined the phrase 'big bang' to characterise, and to ridicule, the opposing theory.[129]

As Bucchi points out, the direct address of scientists to the public can project science into an arena where different criteria apply from those in the worlds of specialist science and science popularisation. Typically, the values of news or politics can supervene.[130] Considerations such as these cause scientists to be apprehensive, and indeed there is a history of scientists trying to control coverage of science in the news media, often motivated by concerns over inaccurate coverage.[131] According to Bucchi, in the context of 'deviation', scientific control of communication is intended not to prevent direct address to the public but rather to extend the scientific influence over the recognition accorded to activities at the margin of science. Scientists can then deviate directly to the public when it is strategically useful to do so.[132] In other words, not all direct addresses by scientists to the public are problematic, but in marginal cases they can be. Moreover, although direct addresses may be deprecated by the scientific community on particular scientific issues, on other issues direct address can be deployed strategically, to the advantage of the scientific community. For these reasons, the scientific community has sought to extend its control over the media's science coverage. However, the extent to which attempts at scientific control

126 Bucchi (1996).

127 Bucchi (2004), pp. 118–9.

128 Bucchi (1996) p.380.

129 Bucchi (1996) p. 384

130 Bucchi (1996), p.387.

131 Nelkin (1995), pp. 144–58.

132 Bucchi (1996), p.387.

of the media have succeeded remains to be explored, according to Bucchi.[133] This thesis is in part an exploration of that issue, although it is not primarily concerned with news coverage of science.

Much scholarly work has suggested that viewing the public's lack of understanding of science as simply a knowledge deficit is altogether too crude.[134] A practical consequence of this work has been an abandonment – in some official quarters at any rate – of a deficit model of the public's understanding of science. Instead, where engagement with the public is sought, for example over contentious policy issues, a dialogue model is preferred.[135]

When contentious scientific issues are in the public arena (such as the vaccination of children), news media are most likely to be involved. A good deal of scholarly work has looked at reporting of science in the news media and in other forms of journalism.[136] Indeed, in scholarly literature, 'science and the media' is commonly taken to be synonymous with 'science journalism'.[137] A common finding of work in this field is that scientists and journalists have different understandings of what makes a science story newsworthy.[138] These cultural differences are often a source of frustration for both parties. Nevertheless, science journalists have tended to reflect the scientific community's concerns more than the public's.[139]

1.7 Authority, symmetry and negotiation

Gregory points out that characteristically philosophical approaches to scientific authority (that is, internalist approaches) identify the distinctive features of scientific knowledge as the source of scientific authority. That is, the distinctive features of scientific enquiry account for the distinctive status of science in society. An externalist, sociological approach, on the other hand, looks at the activities of scientists in relation to other categories of people to elucidate the ways in which scientific authority is constructed.[140] As I have shown, one of the relevant activities in the construction of scientific authority is the popularisation of science.

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133 Bucchi (1996), p.387.

134 For example, Allum, and Sturgis (2004), Wynne (1995), Schiele (2008), Bucchi (2004), 110–23.

135 Miller (2001), Stilgoe and Wilsdon (2009), Holliman and Jensen (2009), Irwin (2009).

136 Bauer and Bucchi (2007), Lewenstein (1995), Bucchi (1998), Hansen (2009)

137 Lewenstein (1995), p. 343.

138 Peters (2008), Dunwoody (2008), Peters (1995).

139 Lewenstein (1995), p.345.

140 Gregory (2009), p.6.

Implicit in Gregory's distinction between philosophical and sociological approaches to the question of authority is the idea that a philosophical approach is at least a reasonable enterprise, and is not rendered redundant by a sociological approach. That is, the distinction acknowledges the possibility that science really does have a distinct status in the field of knowledge, as internalists have always maintained – aside from its having been produced by people called scientists who have been able secure special status for themselves and their work. The question of science's authority can be posed, however, from a more radically relativist position, and the place of this thesis in relation to this relativist position needs to be established.

From this more radical, relativist position, scientific knowledge has no special status by comparison with other forms of knowledge – apart from the fact that it is the preserve of scientists. This position associated with the Edinburgh 'strong' programme in the sociology of science.[141] Barry Barnes and David Edge, two writers associated with this programme give the following characterisation of knowledge, which implicitly grants no special status to science:

> No particular ordering [of nature] is intrinsically preferable to all others, and accordingly none is self-sustaining. Specific orderings are constructed not revealed, invented rather than discovered....[142]

This view is hard to reconcile with an internalist view which sees the procedures of science as serving to establish not only assured knowledge, but the most assured knowledge.

Within the strong programme, the question of trust in, and authority of, science is no less significant than in a non-relativist position. Bloor and Edge write: '[science's] standing is inevitably bound up with such contingent factors as the degree of trust and authority possessed by its bearer, or by the institutions which sustain him and assert his competence and legitimacy.'[143]

In the present thesis, a choice between the strong programme or a weaker version is not required. In both schools, authority is socially constructed. What differs is the epistemological status of the body of scientific knowledge (or *lore*[144]) that is claimed as a basis for this authority. Thus the thesis takes no view on whether a philosophical (or internalist) search for the essential features of science is worthwhile or not. That

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141 Bloor (1991).

142 Barnes and Edge (1982) p. 5.

143 Barnes and Edge (1982) p. 6.

144 Barnes and Edge (1982) p. 6.

is to say, there is no commitment either to the view that scientific knowledge has no special status relative to other forms of knowledge, or to the view that scientific status does have special status.

A methodological feature of the strong programme, however, is certainly appropriate for this theses, and this is the notion of symmetry. This was framed by Bloor as a stance for discussing scientific controversies. When viewed historically, such controversies tend to be framed in such a way that the victors appear to be guided by rational processes, whereas the losers appear to be acted on by non-rational factors, such as sociological influences. In the strong programme, symmetrical explanations are demanded. 'The same types of cause would explain, say, true and false beliefs.'[145] That is to say, adherence to beliefs that are judged true and to those that are judged false need to be explained in the same kind of way.[146] The content of the beliefs does not amount to an explanation for whether that belief prevails or not. This is a controversial idea.[147] However, the central conflict of this thesis is not an intrascientific conflict over competing scientific accounts of the world. The principle of symmetry therefore appears entirely appropriate. That is to say, there is no presumption that one side or the other is the natural victor.

In post-Kuhnian sociology of scientific knowledge, a pertinent question is one identified by Gregory: 'Why does society accept scientific explanations as being authoritative and reliable accounts of the natural world?'[148] Authority, as Gregory indicates, cannot simply be imposed or asserted; it must also be negotiated and accepted. In this context, attention needs to be paid to the parties to the negotiation. Chapter 2 looks at the 'other' party in the interaction between the scientific and broadcasting worlds, and, in particular, how the legitimacy and authority of the professional groups is established.

Summary of Chapter 1

An elitist model of science sees scientists as self-policing, autonomous and as guarding the authority of scientists to adjudicate on scientific matters. It is a form of externalism, and contrasted with internalist, demarcationist philosophies such as those of the logical positivists, Popper and Lakatos. It is also contrasted with 'science and society' accounts which take science for granted and see it as potentially influencing society or in a weak way being influenced by society.

145 Bloor (1991), p.5.

146 Sismondo (2004), p. 42; Pinch (1990), pp. 89–90.

147 See for example, Flew (1982), Brown (1989), Worrall (1990).

148 Gregory (2009), p. 6.

From an externalist point of view, the authority of science is socially constructed, and scientists can use popularisation as a way of asserting their authority. Scientists have tried to control the stories told about science in popular media.

From the mid-nineteenth century to the early twentieth century, science popularisation was a success story. There was a large market for popular science in print, and the market was supplied by a diverse range of authors, including non-scientists as well as scientists.

A great deal of scholarly work has elaborated the ways in which popularisation of science, and science communication in general, can serve the interests of scientists.

Chapter 2
Professionalism, the BBC and public service

2.1 Introduction

Chapter 1 was concerned with theoretical ideas relating to science, and, in particular, to the sources of scientific authority and the nature of scientific autonomy. In this chapter my attention turns to the BBC. As in Chapter 1, I am concerned with questions of autonomy and authority. I begin with general ideas relating to the idea of a profession, and then move on to ideas of occupational autonomy and jurisdiction. Associated with these are the occupational functions of gatekeeping and framing. This is followed by a historical overview of the institution of the BBC: its development, its departmental structure, its constitutional position, its 'privileging' of certain areas of broadcasting output, and its concept of 'public service'.

For most of the period covered by this thesis, the right to broadcast within the UK was a monopoly held by the BBC. As shown below, BBC staff soon came to regard themselves as engaged in a new professional activity, rather than as operating within existing professions, such as publishing, education, or the Civil Service. For this reason, it is necessary to look at some ideas relating to the concept of 'profession', and at the types of professional values espoused by staff at the BBC.

2.2 Professions, social worlds and communities of practice

Macdonald refers to professions as 'occupations based on advanced, or complex, or esoteric, or arcane knowledge,' but concedes that his use of the term 'professional' is shorthand, and not closely defined.[1] This reflects the difficulty sociologists have had in defining 'profession'. Collins points out that although 'knowledge' often occurs in

[1] Macdonald (1995), p. 1.

definitions of profession, trades such as ‘mechanic’, in which knowledge is essential and which are indispensable to modern life, do not enjoy the status of a profession.[2]

Freidson suggest that the definitional problem arises from the fact that ‘profession’ is a changing historical concept,[3] and Collins points out that the term is also geographically variable. Thus, although in Britain and America much is made of autonomy as a characteristic feature of professions, both at the occupational and individual level,[4] in continental Europe the emphasis is likely to be on the élite nature of professional administration, in which office is gained through academic credentials.[5]

Johnson observes that a characteristic of professions is their ability to impose their own definition of the producer–client relationship.[6] An instance of this can be seen in the way professions retain the right to arbitrate on the performance of their work. This right is justified by the claim that only the profession is competent to evaluate itself.[7] For Johnson, a profession ‘is not ... an occupation, but a means of controlling an occupation.’[8] The medical profession, for example, controls the medical occupation. Control of the producer–consumer relationship is exercised through an institutional framework underpinned by professional authority, and this is a feature of all professions, not just the medical.[9]

The institutional framework of a profession is, in several respects, exclusionary. For example, the institution controls access to the occupation, to its markets, to its jobs, and sometimes to its knowledge. The profession itself is the gatekeeper to professional practice, controlling who may serve within it. (The term ‘gatekeeper’ is discussed more fully later, but essentially a gatekeeper has a filtering function, rejecting some inputs and admitting others.) These gatekeeping functions are associated with a monopoly on the provision of a particular service.[10] Such professional privileges are granted ultimately through state sanction.[11]

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2 Collins (1990), p.18.

3 Freidson (1983), p. 22.

4 Horobin (1983), p. 90. Horobin neatly summarises the autonomy of the medical profession: ‘Medical work is what medical workers say it is.’

5 Collins (1990), p. 15.

6 Johnson (1972), p.43.

7 Freidson (1994), p. 71.

8 Johnson (1972), p. 45.

9 Johnson (1972), p.51.

10 Macdonald (1995), p. 29.

11 Macdonald (1995), p. 34.

Professional monopoly signifies more than the right to be the sole provider of a service. It also serves an ideological purpose. The skills relevant to a profession are considered the exclusive preserve of that profession, and are not transferable.[12] Therefore any occupation that appears to offer the same service as a profession, but is situated outside the profession, condemns itself in professional eyes. Johnson writes:

> Charlatanism and quackery are, in this sense, a creation of professionalism and not the cause of it. That is to say that periods in which it is claimed that charlatanism is rife and needs to be stamped out are just those periods when an occupation is attempting to establish or struggling to maintain a monopolistic position.[13]

One of the most important assets of a profession is its jurisdiction. This is the area of activity over which it holds a monopoly, or aspires to hold a monopoly. To have professional jurisdiction over a particular field is to deny it to others: 'one profession's jurisdiction preempts another's.'[14] To some extent, professions compete for jurisdictions; and jurisdictions are apt to change as time passes. Technology can create new jurisdictions, which can be competed for (broadcasting, for instance). A profession cannot take its jurisdiction for granted. Abbott says that 'jurisdictional boundaries are perpetually in dispute.'[15] Thus, although professions are largely independent of market forces, they are not without competitors who can potentially supply similar or complementary services.[16] The notion of professional jurisdiction is thus similar to Gieryn's metaphor of geographical terrain representing science, discussed in Chapter 1. In both cases the border is contested, and its location is determined pragmatically.

One of the professional skills required by a practitioner is diagnosis. The meaning of 'diagnosis' is reasonably clear in a medical context. More generally, diagnosis consists of a professional assessment of evidence presented by a client. This assessment involves, among other things, discriminating between what is relevant and what is irrelevant in the way the client presents to the professional.[17] For example, for an employment lawyer handling a case of unfair dismissal, the client's

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12 Johnson (1972), p. 57.

13 Johnson (1972), p. 57.

14 Abbott (1988), p. 87.

15 Abbott (1988), p. 2.

16 Macdonald (1995), p. 34.

17 Abbott (1988), p. 41.

hatred of the job is irrelevant. To other professionals, though, it may be highly relevant. This winnowing of relevance from irrelevance in relation to a particular profession is known as colligation.[18]

Logically posterior to colligation, though in practice often inseparable from it, is classification.[19] This is where the professional deduces from the client's evidence a diagnostic category. Once again, in relation to the medical profession the meaning is clear. Typically, medical classification might consist of attaching a name to a condition, and possibly also the identification of the appropriate specialism to which the patient should be referred. In relation to professions in general, and not simply medicine, classification is an accommodation of the client's evidence to the structural elements of the professional knowledge system.[20] In law it might consist of identifying the particular legal concepts that are most appropriate, or the specialism most appropriate. A profession, then, among other things supplies a context for classification, and also a context for discounting or ignoring evidence. Commenting on the way institutions provide this context, the anthropologist Mary Douglas refers to '... the hold that institutions have on our processes of classifying and recognizing.'[21]

Two other concepts relating to professions are especially useful: reduction and delegation. Reduction is a strategy for claiming legitimate ownership of a contentious field of activity. (Contention may arise if a field of activity is new, and has therefore not fallen within the traditional jurisdiction of an existing profession.) In reduction, a profession argues that a contended field of activity is a version of what is already uncontroversially within its jurisdiction. In medicine, reduction can be seen in the way hyperactivity in children is brought within the medical jurisdiction by being related to other involuntary behavioural disorders.

Delegation is the transfer of routine remedial activity to fairly junior members of the profession once diagnosis by fairly senior members has been completed. In the medical profession this is seen in the way the practicalities of therapeutics are carried out by nursing staff.

Freidson likens a profession's purview to the Kuhnian view of normal science:

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[18] Abbott (1988), p. 41.

[19] Abbott (1988), p. 41.

[20] Abbott (1988), p. 41.

[21] Douglas (1986), p. 3.

> Embedded in the claims of each of the professions is what Thomas Kuhn (1962) called a 'paradigm' , a taken-for-granted conception of what the issue is, and how its is solvable.[22]

Professions therefore interpret the world in relation to their own understanding of problems and solutions. Politically, they argue for more resources, and justify the argument by reference to general, public good, rather than to the benefits that accrue to the profession.[23] An extreme form of professional authority, where the producer defines what the consumer needs and the way to meet those needs, is referred to by Johnson as 'collegiate'.[24]

Around the middle of the twentieth century, the increasing specialisation of work was considered by some writers to be leading towards a system of 'technocratic' management which would to some extent supersede the old professions.[25] These technocratic managers would form an élite based on merit, and bring a scientific or engineering orientation to social administration. Their authority would be greater than that of a previous ruling class.[26] According to Freidson, in a technocratic society, conflict over jurisdiction determines 'who is to be the technocrat and who not.'[27]

Professions are instances of a more general class of entity referred to as 'social worlds'. Clarke characterises social worlds as 'groups with shared commitments to certain activities, sharing resources of many kinds to achieve their goals, and building shared ideologies about how to go about their business.'[28] Social worlds are usually associated with a primary activity along with subsidiary activities.[29] Besides professions, other examples include recreational groups (for example sports teams and their followers), occupations, and social movements.[30] Social worlds characteristically have jurisdictions, and boundaries, and are often marked by disputes, both between internal factions and between worlds.[31]

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22 Freidson (1994), p. 69.

23 Freidson (1994), p. 70.

24 Johnson (1972), p.45.

25 Burnham (1945), Wright Mills (1956), Young (1958)

26 Johnson (1972), p. 16.

27 Freidson (1994), p. 70.

28 Clarke (1991), p. 131, quoted in Strauss (1993), p. 212.

29 Strauss (1993), p.212.

30 Strauss (1993), p. 160.

31 Strauss (1993), pp. 214–5.

Most of my earlier discussion of professions would fall in Strauss's category of a 'functional' analysis of social worlds. The functional approach concentrates on the 'mechanics' of cohesiveness, emphasising homogeneity within professions, the sharing of identity, beliefs, definition of roles and interests.[32] Strauss comments that the functional view tends to overlook difference within worlds – the differing values, identities and interests which can define identifiable 'segments' within a social world. New specialisms often arise from the growth of a particular segment within a social world.[33] Segments can have relationships with other social worlds outside their own.[34] In fact, disputes over jurisdiction and boundaries are often complicated by participants' multiple membership of different social worlds. Thus, an individual belonging to a segment in one social world could also belong to a different, and possibly competing social world. Areas where segments or social worlds come into contact are referred to by Strauss as 'arenas', and can be sites of competitive manoeuvring.[35] A profession, therefore, should not be assumed to be homogeneous. Internal factions can sit uneasily within a profession, and may look to groups outside the profession as kindred spirits.

For some occupational groups, the work of their members is characterised by a high degree of informality. This is not meant to suggest that their practice is disorganized or lacks any formal context, but that the life and work of the community are constructed though mutual engagement, and evolve in ways that are outside formal descriptions and control.[36] This type of occupational group has been named a 'community of practice' by Wenger.[37] In this type of group, the 'community', is often not congruent with the formal structures of the institution to which the members belong. The formal boundaries, divisions, sections, etc. of the institution cannot be ignored, but they do not represent the frames within which practitioners actually conduct their practice. Specialist expertise might be found in individuals who straddle boundaries, or who only partly belong to an institution. Membership of the community can be fluid, with some people partly insiders and partly outsiders.[38] In this respect, Wenger makes a distinction between boundaries and peripheries. Boundaries are discontinuities, making a sharp distinction between inside and

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32 Strauss (1971), pp.9–10.

33 Strauss (1971), pp.9–10.

34 Strauss (1971), p. 23.

35 Strauss (1993), p. 215–6.

36 Wenger (1998), p. 118.

37 Wenger (1998).

38 Wenger (1998), p.119.

outside, or between membership and non-membership. Peripheries are continuities – areas of overlap, allowing possibilities for interchange, dialogue and negotiation. Peripheries also enable casual participation by outsiders or newcomers.[39] Wenger's concept of periphery has much in common with Strauss's concept of arena, described above, and Kohler's concept of border (the permeable zone between territories), discussed in Chapter 1. As becomes clear later in this thesis, British broadcasting practice is characterised by a somewhat permeable periphery, or border, and by important inputs from border figures not formally belonging to the institution.

2.3 Cosmology, grid and group

Douglas has coined the term 'cosmology' to represent the view of the natural order held by a social group. The natural order enshrined in a particular cosmology becomes, for the social group, the 'hard currency' of explanation. As Douglas puts it, the cosmology of a group enshrines: 'the ultimate justifying ideas which tend to be invoked as if part of the natural order.'[40] For example, a group might claim that '[Such and such] is simply human nature', where 'such and such' is something the group seeks to put beyond debate. A cosmology, therefore, embodies a group's shared understanding of the natural order. Natural order requires no further explanation for the group.

A social group resorts to its cosmology to justify or legitimate its actions, to control or influence what other groups do, and to further the practical interests of the group.[41] Modern capitalist society, for example, tends to be highly individualistic, and the cosmology of groups aligned with this form of economic organisation will typically value the separation of society and nature. Members of such groups can be the masters of nature, for their own benefit.[42] Douglas's work alerts us to the styles of explanation used by groups, and the way those explanations will have a particular view of what the natural world consists of. These elements of the natural world underpin the favoured explanatory style of the group.

Douglas's ideas of cosmology and social group have much in common with concepts arising from scholarship relating to professions discussed above. In particular, the concept of professional jurisdiction can be seen as forming part of the cosmology of a profession. Similarly classification – the activity of referring to the available

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39 Wenger (1998), p.120.

40 Douglas (1982), p. 5.

41 Barnes (1990), p. 70.

42 Ostrander (1982), p.26–7. Ostrander uses the term 'symbolic framework' rather than 'cosmology'.

socially formed categories for framing a diagnosis – takes place within a particular profession's cosmology.

Douglas sees a group's cosmology as being shaped by the structural characteristics of the group, in particular by factors such as the autonomy of individual members of the group and the sense of boundedness of the group. Douglas devised a typology for the structural characteristics social groups with a view to elucidating how the group's characteristics shape its cosmology.[43] Her typology of groups uses the concepts of 'group' and 'grid'. These are independent sociological dimensions, and together they characterise the social organization of a group. The meanings of 'group' and 'grid' have shifted through the various publications and editions in which Douglas has elaborated her ideas.[44] 'Group' is the less problematic of the two dimensions. It captures the idea of social incorporation, and the 'experience of a bounded social unit'.[45] In a later evolution, the idea of 'group' also captured the normative character of group membership – the sense of obligation that group membership entails.[46] Describing a social group as 'strong group' means there is a strong sense of group membership, and a strong sense of boundedness to the group.

In contrast to group, 'grid' is an ego-centred or individualistic concept. It refers to the network of rules, or the structure, that relate one member to another. It covers such formal and informal arrangements as managerial hierarchies, degree of competition between members, and degree of autonomy of individual members.[47] Characterising a group as 'strong grid' means that there is a high level of order regulating the scope for action of members.

An example of a social group characterised by strong-group and strong-grid is a modern army. The group is clearly bounded, and individual members are obligated to each other through a well specified network of responsibilities which means that individuals have limited autonomy. However, it does not follow that a group characterised as strong-group, strong grid is synonymous with a modern army. Rather, a set of grid-group coordinates tell us something about the 'cosmology' of the group.

Weak-group and weak-grid characterise, among other groups, modern capitalist society, in which competitive, ego-centred entrepreneurs are to a large extent free

43 Douglas (1970); (1982)

44 Fardon (1999), pp. 110–22; 218–25.

45 Fardon (1999), p. 219.

46 Fardon (1999), pp. 219, 115.

47 Fardon (1999), pp. 110–20.

agents and do not belong to a formal group. ‘Strong group, weak grid’ characterise a form of social organisation with a strong group ethos, but with a low level of internal organisation. In such a group, the weak grid might be manifest in the high level of autonomy individuals enjoy. Such groups are likely to be menaced by unresolved internal problems (because a weak group usually lacks a means for resolving internal problems),[48] and beset by anxieties about the external boundary.[49] Internal problems are likely to be settled by demonization and expulsion of individuals from the group, rather than through formal procedures. Academic groups, such as staff within a university department, have been identified with this configuration of group and grid.[50]

2.4 The profession of broadcasting

Among BBC staff, the idea that broadcasting was a profession with its own jurisdiction and its own skills developed fairly quickly. Burns identifies changing views among BBC staff relating to what these skills entailed. Initially ‘professionalism’ within the BBC was closely bound up with the first Director General John Reith’s conception of broadcasting as a public service (on which there will be more later). Broadcasters set much store by ‘balancing’ the programme of broadcasts. This was the art of fashioning diverse strands of output into a balanced suite of offerings so that everyone would find something of interest at some point in the schedule. Balancing acquired more importance than the attainment of high standards in individual broadcasts, and was regarded as a task for BBC staff to satisfy within their own terms, without reference to other authority.[51] BBC staff saw themselves as responsible for balancing, and also as the judges whether it had been done satisfactorily.

By the 1950s, the public-service aspect of broadcasting had become ‘a set of conventions’.[52] Broadcasting was seen by its practitioners less as the performance of a public service, and more as the creation of a polished, ‘professional’ output.[53] This output could be created within a commercial or a non-commercial setting, and within a broadcasting career a practitioner could switch between commercial and non-commercial sectors, possibly more than once. Thus the word ‘professional’ came to

48 Fardon (1999), p.115.

49 Fardon (1999), p. 117.

50 Fardon (1999), p.117.

51 Burns (1977), pp. 47–8.

52 Burns (1977), pp. 122.

53 Burns (1977), pp. 124–6.

have an evaluative sense, in which work that was more or less well done could be located on a graduated scale of professionalism. 'Professional' (as an adjective) could be deployed to stand for any of a wide range desirable qualities in broadcasting.[54] To do bad work was to be a bad professional, or maybe not even a professional at all. This evaluative use of the term 'unprofessional' among BBC staff was different from its usage in the paradigmatic professions such as law and medicine, where 'unprofessional' suggested ethical infringement rather than incompetence.[55] Burns found that the BBC's use of the term 'professional' also embodied a moral frame of reference in relation to which judgements were validated. That is to say, although the professional was expected to obey contractual obligations, to be loyal to the employer, and to comply with whatever external demands were appropriate, these were not sufficient to qualify as professional. The term 'professional' implied judgement against an altogether higher set of principles, although these principles are not explicitly stated.[56]

All professions determine who can practise, but in the case of the BBC, where entry is not guarded in the same way as in the paradigmatic professions of law and medicine, a different sort of entry control operates based on the ability to deploy the medium responsibly and competently. According to Burns, as mentioned above, this sense of professionalism came to supplant the Reithian sense of public service broadcasting in the post-war period.[57] This extreme professional self-consciousness, according to Burns, could be seen in what he termed the broadcasters' self-created 'autistic' world constructed of the activities and beliefs of members of the profession.[58] Such an inward-looking attitude arose partly because the profession was perpetually acting to resist pressures, or the threat of pressure, from outside. According to Burns, the BBC 'sees itself as perpetually beleaguered, under pressure, being lobbied, or being compelled to lobby.'[59] A couple of examples of external pressure on the BBC (not from Burns's work) give force to Burns's comments.

In 1934 the wife of an unemployed man spoke on BBC radio of the difficulty of feeding her family adequately, and her presentation was followed by a doctor who said the diet available to the woman's family was inadequate for healthy living. Sir George Newman, the Chief Medical Officer of the Ministry of Health, who had

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54 Burns (1977), p. 124.

55 Burns (1977), p. 124.

56 Burns (1977), p. 126.

57 Burns (1977), p. 126.

58 Burns (1977), p. 32.

59 Burns (1977), p. 32

insisted on vetting all scripts relating to medical matters prior to broadcast, had proposed changes to this script prior to broadcast, and had questioned the use of this particular doctor, but the producer and doctor ignored his emendations. In the ensuing rumpus, the Director General John Reith insisted on the autonomous position of the Corporation, and Newman issued veiled threats about having medical broadcasts restricted. Although the BBC gained the upper hand in this battle, with the General Medical Council upholding the Corporation's right to select its own speakers, within a few years BBC producers were being reminded by their managers of the need to consult the British Medical Association and the Ministry of Health about medical subjects and the choice of speaker.[60] Several other examples of interference are supplied by Goldie, who recounts threats by the British government to take control of the BBC's news output during the Suez crisis in the 1950s.[61] Later in this chapter, Doctor's findings regarding attempts by the musical profession to control the BBC's music output in the 1930s are briefly summarised.[62] Scannell, however, reports an episode in the 1930s when Ramsay MacDonald's government attempted to silence the series *Time to Spare*, in which unemployed people spoke about their experiences of poverty and unemployment. In the face of resistance from John Reith, the BBC's Director General, the government climbed down.[63]

In the light of these and countless other episodes, it is clear that the autonomy of BBC production staff is not absolute. Ursell observes that the autonomy of media professionals '...has to be negotiated and renegotiated with others – it is a relative autonomy.'[64] Despite their negotiated and only relative autonomy, media producers (including those in public service broadcasting) according to Hesmondhalgh often believe themselves to operate with high levels of autonomy, and to be independent of powerful groups in society, judging by the comments they make in published interviews. However, 'the view of many media analysts is that media producers overestimate their autonomy, and instead tend to reproduce viewpoints that, on the whole, support existing patterns of power.'[65] Schlesinger, following ethnographic research in BBC newsrooms in the 1970s, comments on the way the concept of 'professionalism' is deployed in a self-serving way. He observes that 'professionalism' embodies notions of communication and effectiveness for which

60 Karpf (1988), pp. 39–41.

61 Goldie (1977). Grace Wyndham Goldie was a producer of current affairs broadcasts at the time of the Suez crisis, and her book is a memoir rather than as academic study.

62 Doctor (1999)

63 Scannell (1980).

64 Ursell (2006), p. 158.

65 Hesmondhalgh (2006), p. 53.

practitioners have no justification. Practitioners dismiss 'poor' use of the medium, such as talking heads in television, 'in terms of that pliable notion, professionalism.' Schlesinger considers that the news professionals

> assert their possession of the necessary knowledge for effective communication. Ultimately the newsman is his own audience. When he talks of his professionalism he is saying that he knows how to tell his story.[66]

Hendy finds that producers' autonomy is constrained by their need to interpret and anticipate audience needs, and also by institutional factors within the broadcasting organisation itself. Producers' ideas, then, are never conceived independently of the context in which those ideas are realised.[67]

2.5 Gatekeeping and framing

A function that broadcasting shares with other forms of publishing and dissemination is that of gatekeeping, a term used earlier.[68] It invokes the metaphor of a gate, operated by a gatekeeper who decides what to allow through and what to reject, and originated with social psychologist Kurt Lewin, in a paper from 1948 relating to domestic food choice[69] The gatekeeper idea has proved fruitful in media research. In 1950, D. M. White observed a wire editor at work in a small newspaper in the US, and identified diverse reasons why some stories were rejected and others accepted.[70] Much subsequent work has been concerned with refining the gatekeeper concept, extending it to other media, and, following White, elucidating the factors that affect gatekeepers' choices. Shoemaker comments that all communication workers are to some degree gatekeepers, as selection operates at almost every stage leading to publication,[71] and Redfern identifies the gatekeeping function of BBC radio science producers.[72]

As mass communications in the twentieth century has mainly been the province of large institutions, with their own ways of working, institutional culture has been reflected in the actions of gatekeepers. Hansen refers to the way in which, in British

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66 Schlesinger (1978/1987), p. 134.

67 Hendy (2000b), pp.71–3.

68 Bass (1969), Berkowitz (1990), Dimmick (1974), Willis (1987), and others.

69 Lewin (1948) 'Group decision and social change', republished in Lewin (1999), pp. 265–84.

70 White (1950).

71 Shoemaker (1991)

72 Redfern (2009), p. 183.

journalism, organizational constraints and professional practices of journalists strongly affect when and how science is covered.[73] Furthermore, Hansen finds that even when science journalists have had a scientific education, their values are at root those of journalists. That is, their gatekeeping activities are more informed by a journalistic ethos than by a scientific one.

In the publication of scientific journals, 'gatekeeping', in the form of the rejection of a large percentage of items submitted for publication, was an early practical necessity;[74] but has also served as a means by which an inner group controlled a body of knowledge, for example in the French Academy of Sciences.[75] In the era of digital communication, some journals have adapted gatekeeping procedures to the new technologies, by feeding stories related to articles within the journal directly to news agencies and newsrooms.[76] Professional practices can include gatekeeping. Freidson describes how, in the USA, primary practitioners function as gatekeepers by deciding which patients are referred to other practitioners or specialists.[77] Gatekeeping thus does not refer only to filtering of inanimate materials, such as news reports. Gatekeepers can determine who is allowed into a community and who is excluded.[78]

Allied to gatekeeping is framing, which relates to presentational style. Nisbet and Mooney write: 'Frames organize central ideas, defining a controversy to resonate with core values and assumptions.'[79] Hence newspaper stories are framed in ways that will play on the interests and concerns of the reader. Frames 'allow citizens to rapidly identify why an issue matters, who might be responsible, and what should be done.'[80] Framing might entail omitting certain elements of a story, and retaining others. Anderson *et al.* characterise science journalism as 'source driven and source framed', meaning that the scientific world in which these stories originate strongly influences the framing of the stories in popular media.[81] Allan discusses the ways in which science stories are framed to give them a quality of 'newsworthiness'.[82] The decline in editorial resources in conventional publishing channels in recent decades

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73 Hansen (1994), pp. 131–2.

74 Gregory (2009), p. 6.

75 Crosland (1992)

76 Trench (2009), pp.171–2.

77 Freidson (1975), p. 69.

78 Becher and Trowler (2001), pp. 84–5.

79 Nisbet and Mooney (2007), p.56.

80 Nisbet and Mooney (2007), p.56.

81 Anderson *et al*. (2005)

82 Allan (2009).

has made communication media ever more dependent on its sources.[83] Ulin provides first-hand experience of commercial influence on the framing of science in broadcasts in the USA.[84] Ulin wrote short science talks for the syndicated series *A Moment of Science*, which consisted of two-minute radio science items produced at Indiana University for commercial broadcasters to incorporate in their output. Ulin shows that this format pushed contributors to a style where the emphasis was on amazing the listener with surprising facts and feats of nature.[85] The lack of time for complex discussion fostered a politically and ethically neutral view of science. The style suited corporate sponsors who benefited from the promotion of an uncontentious view of science. It also suited proponents of a greater public understanding of science, who were inclined to equate a knowledge of science with a knowledge of disembodied facts of the kind the programmes dispensed.[86] Programmes like *A Moment of Science*, Ulin says, distort real science and promote an 'uncritical respect for scientific authority.'[87]

Silverstone gives an example from the UK. In the making of a science documentary for the BBC *Horizon* series, he observed a gradual taking over of the storyline by the television producers in such a way that the final product met the producers' needs rather than the scientists'.[88]

2.6 BBC History: From radio telegraphy to broadcasting company

For a fuller appreciation of the disputes between the world of science and the BBC it is necessary to understand the nature of the BBC, its autonomous status (and what this has meant in practice) and its constitutional position. These can be appreciated through an awareness of the historical circumstances of the BBC's creation and its development. Accordingly, the following sections of this chapter are historically based, and draw mainly on Briggs's *History of Broadcasting in the United Kingdom*.[89]

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83 Davis (2000) p.39

84 Ulin (2003).

85 Ulin (2003), p. 170.

86 Fuller (1997, p.1) characterises the science world's response to the public's ignorance of science as 'moral panic.'

87 Ulin (2003), p.174.

88 Silverstone (1984).

89 Briggs (1995).

Radio transmission in the UK and elsewhere was not originally regarded as a means of broadcast communication. That is, radio was not intended as a means of delivering an identical message simultaneously to a multitude of listeners. Early wireless transmissions consisted of telegraphic messages (that is, morse code), usually commercial or military in origin though sometimes from amateurs, sent from a single point for the attention of someone at another single point.[90] This point-to-point use of radio communication was well established in the first decade of the twentieth century. The broadcast nature of the medium, whereby a transmission could be received by multiple receivers, was regarded as a nuisance and a potential security risk.[91] When speech transmission became possible (that is, radio telephony, as opposed to radio telegraphy), from around 1906 onwards, the possibilities for broadcasting continued to be unrecognised.[92]

The First World War brought many technical and social developments in radio. From a technical point of view, the introduction of the thermionic valve, around 1915, brought improvements in transmitter and receiver design. From the social point of view, many military personnel were trained in the operation and maintenance of the new radio equipment, and developed an interest in it. In the United States, which did not enter the war until 1917, pioneers developed the idea of transmitting intentionally to multiple recipients – that is, broadcasting. At this time recipients were mainly amateur radio enthusiasts. With the entry of the US into the European war, the US government commandeered all wireless stations, as some European governments had in Europe, and these experimental broadcasts ceased.[93].

Following the end of hostilities in 1918, returning military personnel enlarged the pool of knowledgeable radio amateurs. The potential of radio as a means of mass communication became increasingly apparent. The Marconi Company began experimental entertainment radio broadcasts in the UK in February 1920, and, apart from a hiatus in 1921, other private broadcasting companies and amateur broadcasters soon followed. These broadcasts were licensed by the Post Office, which regulated all broadcasts within the UK. Permission to broadcast was granted grudgingly because of alleged interference with point-to-point military telegraphy.[94] The need for broadcasters to obtain a broadcasting licence, and to renew it from time to time, continues. Initially the BBC had to apply to the Post Office to renew its

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90 Hennessy (2005).

91 Gorham (1952), p.22.

92 Briggs (1961) pp. 32–36.

93 Briggs (1961), p 36

94 Paulu (1956) p 8, Briggs (1961) p 56

licence; now the Home Office grant the licence. Licence renewal is separate from the BBC's Charter renewal, which is essentially a renewal of the BBC's right to exist as a broadcasting organisation, rather than its right to transmit. However, the durations of the BBC's licences and charters are usually set to the same length so that they can be renewed together.

Broadcast radio had no obvious analogues as a mode of communication or as a means of providing a public service. The appropriate modes of regulation, and possibilities for, or ethics of, revenue generation, were not clear. Different countries tended to develop their own approaches.[95] In the USA, mass radio broadcasting, funded by subscription, sponsorship and advertising, expanded apace during the early 1920s. Trespassing of one broadcaster on another's frequency was common. Largely to prevent a repetition of the chaotic American situation,[96] the Post Office convened a series a meetings with UK broadcasting companies (actual and would-be) in 1922. Military and amateur users of radio were also represented. The Post Office's intention was to restrict severely the use of frequencies and the type of material that could be broadcast, a proposal that was not well received by the broadcasting companies. In the end, a compromise was reached which allowed for the licensing of a limited number of British broadcasting companies. These companies would be allowed to operate in designated cities, and there would be limits on their transmission power and the times of day at which they could operate.

The broadcasting companies sought a way to operate under the regulations laid down by the Post Office. The Post Office favoured co-operation between the companies rather than competition, and was unwilling to allow advertising. The companies themselves proposed that they form a consortium for broadcasting, and that the Post Office allow only receiving equipment made by members of the consortium to be sold in Britain. Broadcasting would be funded jointly through a royalty on sales of receiving equipment and from a portion of the licence fee which the Post Office would levy on owners of receiving equipment.[97] On this basis, the British Broadcasting Company came into existence on 15 December 1922. It received its licence to transmit a month later, on 18 January 1923. In its first incarnation, therefore, the BBC was a coalition of manufacturers who hoped to promote sales of their receivers by providing a service for buyers to listen to. Furthermore, when the BBC began, transmission technology was insufficiently developed for large-scale national or regional broadcasting of the kind now familiar. Broadcasts were directed at towns and cities. In modern terms, the first broadcasters in the UK were local

95 Leblebici *et al*. (1991) p.336.

96 Camporesi (2000), p.19.

97 Scannell and Cardiff (1991), p.5

radio stations, owned and operated by commercial companies, though not funded by advertising. Four years later, the British Broadcasting Company became the British Broadcasting Corporation.

One of the first technical challenges faced by the BBC was simply that of extending its coverage so that a larger part of the country could be reached. Given the city-based system of independent transmitters on which the BBC was founded, the initial method for increasing coverage was simply to build more transmitters. In 1923, there were transmitters at London, Manchester, Birmingham, Newcastle, Cardiff, Glasgow. More followed, at Bournemouth, Aberdeen, and Belfast (1924), with relay stations at Nottingham, Leeds Sheffield, Hull, Liverpool, Stoke-on Trent, Plymouth and Edinburgh. The transmitters were linked to London by land lines leased from the Post Office. These were low-power transmitters, with a range of about 25 miles (Figure 2.1).[98] The relay stations had a lower range, of the order five miles.[99] Programmes were a mixture of locally generated material and material produced in London.

[98] Briggs (1961, p.197) gives a radius of about 25 miles for the early city based transmitters, although in many parts of the country poor propagation characteristics of the terrain reduced the range considerably. Hennessy (2005, p. 168) says that around 1922 a 'good' range for a pre-BBC city-based transmitter was 10 miles for crystal-set reception, but at least 100 miles for reception by a two-valve receiver. Gorham (1952, p. 35) says that valve receivers were in general use by November 1926, but the BBC nevertheless still quoted range figures for crystal set reception. It seems likely that Briggs's 20-mile range is therefore for crystal-set reception.

[99] Briggs (1961), p. 200. Briggs states the 5-mile range is for crystal-set reception.

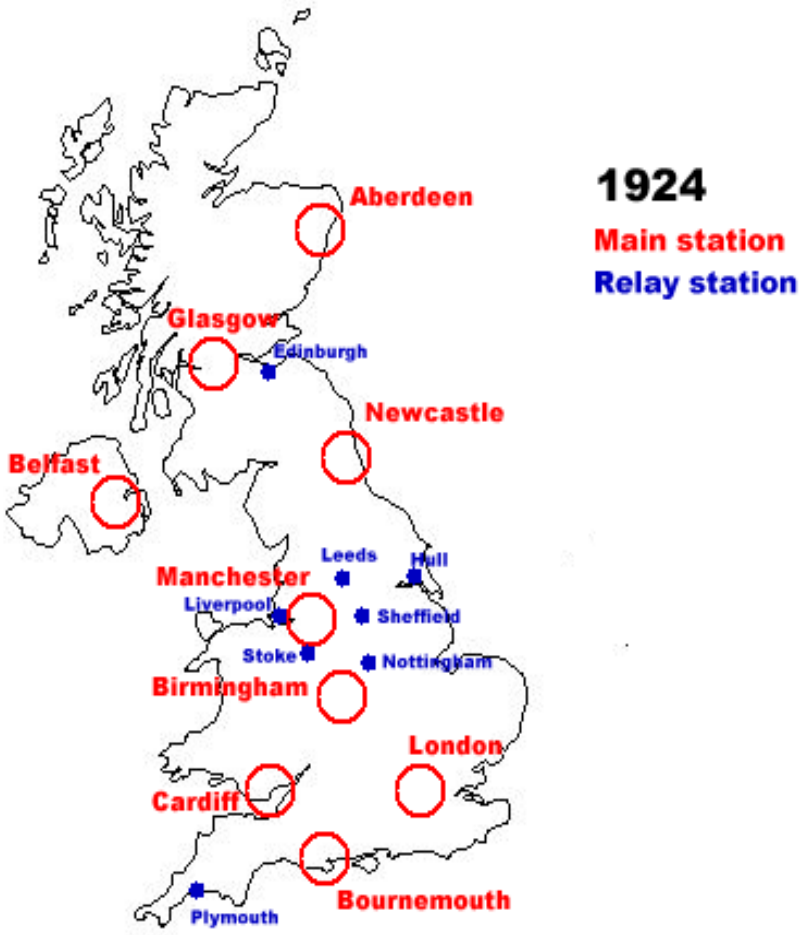

Figure 2.1 BBC transmitters and relay stations in 1924. Compiled by Jones from Briggs (1961). The circles indicate approximate zones of coverage for crystal-set reception

The small range of the transmitters left large tracts of the country unserved, especially rural areas. The gaps could not be filled by building more transmitters because, under international allocations, the BBC did not have sufficient frequencies. The solution was to use fewer, but higher powered, transmitters, which were now becoming feasible thanks to successful BBC research. In the second half of the 1920s, therefore, new transmitters were installed to serve regions rather than cities, and the older city-based transmitters were gradually removed. Figure 2.2 shows the administrative centres of the regional system devised in the second half of the 1920s. Substantially the same system remains today.

All the frequencies used in the regional system were in the medium waveband, as they had been in the city-based system. The BBC was also allowed one frequency in the long waveband, and this was used for a high-power, wide-coverage transmitter, initially at Daventry (Figure 2.3). It was replaced in the early 1930s by an even more powerful transmitter with increased coverage, which is shown by the larger circle in Figure 2.3. In 1934, long-wave transmission was transferred to Droitwich.

Long-wave transmissions filled the gaps left by the medium-wave transmitters. The quality of the long-wave service was considered inferior to that on medium wave, hence long wave was not regarded as the primary waveband, even though a single long-wave transmitter (after the upgrade in the early 1930s) could cover most of the population of the UK.

Figure 2.2 System of regional transmission of the BBC. Compiled from Briggs (1961)

Figure 2.3 Long-wave coverage. The larger circle was a result of upgrading the transmitter in the early 1930s. Compiled by Jones from Briggs (1961)

The early years of the BBC were characterised by a remarkably rapid growth of radio coverage and ownership. By the end of 1926, at least 70% of the British population was within range of a local station using a crystal set, and nearly 50% were within range of the Daventry long-wave transmitter.[100] The upward trend in radio ownership, as indicated by the number of licences held, continued, with occasional dips, through the 1930s and 1940s (Figure 2.4). Each licence was reckoned to represent three or four listeners.[101]

Figure 2.4 does not show the extent of penetration of radio ownership, as the number of households in the UK was not constant over the period shown. Pegg gives statistics for licence ownership per 100 households in the period 1922 to 1939, during which the estimated number of UK households rose from approximately 10.7 million to 12.5 million.[102] Pegg's statistics were used to plot Figure 2.5.

[100] Gorham (1952) p.39.

[101] BBC (1931a), p.32 and BBC (1939), p. 11.

[102] Pegg (1983), p. 7.

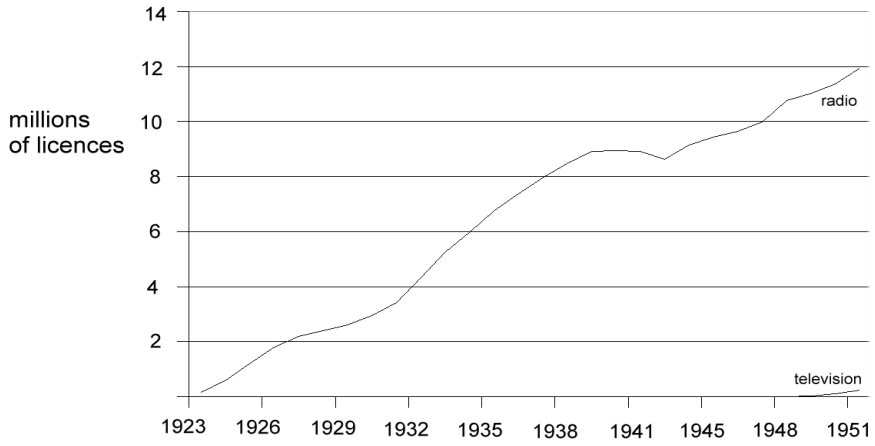

Figure 2.4 Growth of licence ownership (graph by Jones, based on data in *BBC Handbook*)

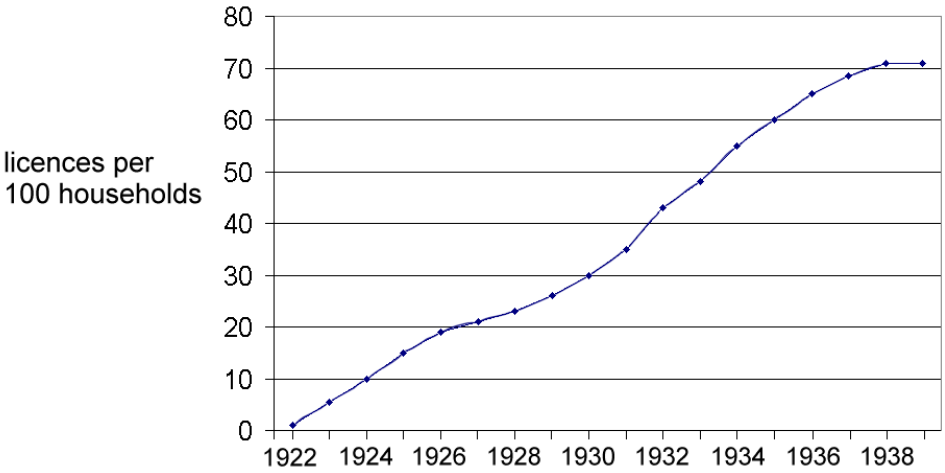

Figure 2.5 Growth of licence ownership per 100 households (graph by Jones, based on Pegg, 1983, p. 7)

The graph in Figure 2.5 shows that in the space of about 15 years, the penetration of licence ownership by UK households went from almost zero to over 70 percent. By the outbreak of war in 1939, the BBC had in the region of 30 million listeners and reached nearly three-quarters of households.[103] This was despite the fact that radio sets were not cheap, typically costing in the region of £10 by the mid-1930s. See Figure 2.6. (The prices in Figure 2.6 are given in guineas. A guinea was £1 and a shilling, or £1.05.) In the period between 1918 and 1939, weekly income for miners and agricultural workers (two of the largest occupational groups) fell into the range £1/10s (=£1.5) and £2.[104]

[103] Scannell (1992), p.319

[104] Pegg (1983), p. 47.

Figure 2.6 Radio advert from 1934 (*The Times* 'Broadcasting' supplement, 14 August 1934, p. xi) The 12½ guinea model is described as an 'Eight-stage superhet with bandpass tuning' and as having 'Full delayed automatic volume control (amplified)'. Output is rated as 3.5 watts

By the mid-1920s, the BBC's transmitters were carrying a single, national service called, appropriately, the National service, which mainly originated from London. However, the BBC's Director General John Reith wanted to offer listeners a choice. Because the newly developing system of regional transmitters was more economical with frequencies than the city-based system, it became possible to find frequencies for broadcasting alternative fare. Each of the new regional transmitters was in fact a double transmitter. One transmitter carried the National service and the other carried the so-called Regional service. By the early 1930s most listeners could choose between the National service and a Regional service. However, the distinction between the National and Regional services was not quite what their names suggest. The National service originated for the most part in London, and was heard throughout the UK. The Regional service originated largely in London and other Regions contributed to it. Parts of the London Regional output were included in the Regional service in other Regions. Thus, outside London, programmes carried by the Regional service would mostly have originated in London, but parts might have originated in the local region, or in another region.[105] To complicate matters further, the National service itself was subject to a certain amount of regional variation, although this was relatively small.

Regional programmes were planned to contrast as far as possible with those in the National service. Thus, when one service was offering music, there was an intention that the other would be offering speech, and so on. There was no fundamental difference between the *types* of service offered on the National service and the Regional service. For instance, one service was not 'serious' and the other 'light', nor was one mainly speech-based and the other music-based. The idea of tailoring a service to a particular type of listener was antithetical to Reith's idea concept of public service broadcasting, and only became standard practice during the Second World War, by which time Reith had left the BBC. (Reith resigned in 1938.)

Gradually the Regions developed specialisms. The North became associated with documentary features, the Midlands with industrial broadcasts and variety, and the West with agriculture.[106] The West region also developed a reputation for radio natural history broadcasts, centred on an informal grouping of radio producers and scientists in the Bristol area. In the early 1950s this loose, radio-based group began to experiment with televised natural history programmes, leading to the establishment of the Natural History Unit in 1957. [107] This informal arrangement between BBC

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105 Gorham (1952), p. 79, 89.

106 Gorham (1952), p. 79.

107 Davies (2000) pp. 439, 442.

producers, external scientists and natural historians appears to have been relatively unproblematic as regards the influence of non-BBC people on the work of the Natural History unit.[108]

The National and Regional services continued until the outbreak of the Second World War. By that time there was also an Overseas service on short wave, and a fledgling, and somewhat experimental, television service available only in the London area.[109] With the outbreak of war, the National service became the Home service, and the Regional service was replaced (after Dunkirk) by the entertainment-oriented Forces service, which proved popular both with civilian listeners and services personnel. Television stopped for the duration of the war, but overseas broadcasting was expanded. The war period brought a certain degree of 'Americanisation' of British radio, in the sense of the adoption of more popular styles and content. This was a response not only to the need to boost morale, but also to the increasing presence of US service personnel within Britain as the war progressed.[110]

After the war, the pre-war National and Regional system was not revived. It was felt that the war-time split of broadcasting along popular/serious lines had been a better match for what listeners wanted. Accordingly, the Home service was retained as a generally serious network, and the popular Forces service became the Light programme. On 7 June 1946 BBC television re-commenced, and the Third Programme was launched as a new radio service with an avowedly cultural remit on 29 September 1946.

The Third/Home/Light system remained in place until 1967, when Radios 1 and 2 replaced the Light Programme, Radio 3 replaced the Third Programme (though it was no longer called the Third Programme), and Radio 4 replaced the Home Service. Although they do not feature in this thesis, for the record, commercial television began in 1955, and BBC2 (the UK's first colour television service, based on 625 lines rather than the earlier 405 lines) began in the London area in 1964 and spread outwards over the following years. Local radio began in 1967 (in Leicester), and commercial radio started in 1973.

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108 Davies (2000).

109 Robson (2004)

110 Camporesi (2000)

2.7 BBC departmental structure

The BBC's internal structure changed several times during the 1920s and 30s. When the BBC became a corporation in 1927, programmes were created in the Programme Division, whose head was the Assistant Controller (Programmes). Other divisions were concerned with engineering, administration, and so on, and each had its own Assistant Controller.[111]

The Programme Division in 1927 was subdivided into four main departments:

Talks
Education
Music
Productions

The last of these, 'Productions', is not self-explanatory. The Productions department was concerned with dramatic presentations using actors. In addition to plays, the department's output included dramatic presentations scripted internally by members of the department's own staff. A few years later 'Productions' was re-named 'Features'.

The Talks department had no scriptwriters on its permanent staff, just producers (initially called Talks Assistants), administrators and secretarial support. Speakers, who were nearly always from outside the BBC, created their own scripts, which were developed in conjunction with a member of the Talks department, and then delivered on air by the speaker himself or herself. It is the work of the Talks department that concerns this thesis.

The proportion of BBC output devoted to Talks has fluctuated. In the 1920, 30s and early 40s it was in the region of 8% to 11%, as Table 2.1 shows.

Table 2.1 Percentage of BBC output as Talks, 1927–42[112]

Year	1927	1928	1929	1930	1934*	1937*	1939*	1942
% of output as Talks	9.13%	7.92%	8.87%	11.2% (National) 6.8% (Regional)	8.15%	8.2%	10.8%	11.3% (Home) 5.4% (Forces)

* For 1934, 1937 and 1939, National and Regional are aggregated.

[111] The designations 'division', 'department' and 'branch' were changed more than once in the 1920s and 30s. For ease of comparison with later structures, I am using the terms 'division' and 'department' with meanings that were attached to them in 1935. See Briggs (1995a), p. 408.

[112] Figures for 1927–30 are from Briggs (1995a), pp. 34–5. Figures for 1934 and 1937 are from Cardiff (1983), p. 379. Cardiff's figures appear to aggregate National and Regional, and to cover a whole year. Briggs's figures (i.e. 1927–30) are for the third week of October in each year. An indication of the variability is given by the fact that the BBC Handbook for 1928, p. 70, gives the Talks output for 'a typical winter month' as 14.5%. The winter months were when the adult education programme was at its most active and when talks could be expected to assume a larger place in the schedules. The 1939 figure is for January of that year and is calculated from data in Briggs (1970), p.87. (By 1939 the BBC's Adult Education provision was greatly reduced from that of the early 1930s.) Figures for 1942 are from Briggs (1970), p. 539.

Establishing the percentage of Talks output devoted to science is beset with difficulties, as I explain in Chapter 3, owing to the problems of determining what counts as a science broadcast and also because of 'hidden' science in general-interest programmes. However, some tentative figure are offered in Table 2.2. Figures for 1930 and 1934 are my own estimates, derived in Chapter 3. The figure for 1931/32 is not an estimate, but is implicit in the adult education syllabus for the winter of 1931 and spring of 1932, as Chapter 3 explains. For 1930, 1931/32 and 1934, the figures relate only to science talks in the adult education programme.

Table 2.2 Percentage of Talks output as science, 1930–4
(see text above for important qualifications)

Year	1930	1931/32	1934
% of Talks as science	11.5%	17%	6%

Two further statistic are relevant here. In 1949, an official BBC statistic covering all radio output (not just talks) quotes science as occupying 7.5% of output;[113] and in 1962, a group of scientists arguing for more science broadcasts (and therefore not disinterested) calculated, on the basis of BBC data, that 5% of radio output and 6% of television output were devoted to science.[114]

At various times in the first decade of the BBC, adult education moved in and out of the Talks department. Initially it was part of Talks, but in 1931 became a separate department. It was restored to Talks in 1932, retaining its separate identity. In 1934 it merged fully with Talks.[115] Generally, the most ambitious series of talks produced by the BBC in the early 1930s were part of the adult education stream. Although adult education talks were intended to appeal to the general listener, for the more systematic follower of the broadcasts there were additional resources, such as printed materials and (sometimes) local listening groups.

With the exception of the Music department, the departments listed earlier were not differentiated from each other by programme content but by style of presentation. This was to remain true throughout the many subsequent reorganisations of the BBC. Thus, on the whole, programmes did not originate from subject-specific departments such as Arts, History or Sport. Any of the departments named, or their successors, could, and did, produce science broadcasts. The introduction of further divisions for Overseas Broadcasting and for Television in the 1930s extended the number of

[113] WAC, R6/34, letter to Sir John Anderson from M. G. Farquharson, 25 November 1949

[114] WAC R6/239/1, note of a meeting held at Burlington House 12 December 1962

[115] Briggs (1995a) p. 206.

divisions that had an interest in science, or almost any other subject. By 1938, the departments which could tackle science were:

Television

Features and Drama

Outside Broadcasts

Talks

News

Schools

Overseas services

Although the work of the Features department hardly figures in this thesis, it is worth mentioning here two specialist producers with interests in science. They were Isa Benzie, who specialised in medicine and health, and Nesta Pain, who specialised in science.[116]

As the BBC added additional programme networks, such as the Regional network in the 1930s to complement the National network, or, in the post war period, the Home Service, Light Programme and Third Programme, the departments above (or their descendants) operated as supply departments to all the networks. Thus, for instance, in the post-war period, each of the Home, Light and Third programmes would have a Controller and a small number of supporting staff. The controller would decide on the programmes needed for that network with the appropriate supply department. Producers of radio programmes were attached to supply departments, and each department had its own head (for instance, Head of Talks). Producers were thus in the position of having to satisfy two masters – the Head of their own department, and the Controller of the Network who had commissioned the programme.

Officially, the supply departments, such as Talks, were of equal standing with the output departments, but they had a 'de facto subordinate relationship'[117] in which the initiative for new programming ideas lay with network controllers, on the output side, as opposed to the departmental heads on the supply side.

2.8 Advisory councils

Since the earliest days of the BBC, there have been BBC advisory councils. They exist to advise the Director General and BBC managers, and meet three or four times

[116] WAC R51/529, paper for conference at Cambridge 18–19 May 1946 (Science and Radio).

[117] Burns (1977), p. 50.

a year.[118] They have no role in formulating programme policy. Typically a meeting will involve a survey of forthcoming broadcasts in a particular subject area, or retrospective survey of recent broadcasts. Members of the council will include BBC staff and appointed members from outside the BBC. The BBC's charter requires the corporation to have such bodies.[119]

Among the earliest advisory councils were those relating to religious broadcasting and to children's programmes.[120] However, prior to the institution in 1964 of the Science Consultative Group (an advisory council in all but name), the BBC had no advisory body specifically for science programming.[121] Scientists have, however, figured in the membership of the General Advisory Council[122] (the largest of the advisory councils) and the Talks Advisory Council. Until the outbreak of the Second World War, when the advisory councils were discontinued for the duration of the war, the BBC regarded these two bodies as supplying whatever high-level scientific advice was required by programme planners and producers.

Although from an official point of view the BBC values the contribution of these advisory bodies, production staff have been critical. Stuart Hood, a producer who has worked for both the BBC and ITV, made a submission to the Annan Committee in the 1970s in which he spoke of them providing '... not a reflection of public taste so much as a constant stream of pressures – generally from some section or some sub-section of the Establishment.' Hood says that members of advisory committees '... cheerfully castigate programmes they will then admit to not having seen,' and: 'Like all amateurs they are prolific in advice to professional programme makers, who require a high degree of patience when listening to and then rejecting programme ideas any trainee director would know to be boring or impossible.'[123] Gorham writes that some of the advisory councils were devices to give a 'semblance of consultation', and, far from enabling outsiders to influence broadcasts, they served 'to acquaint influential people with the problems and policies of the BBC'[124]

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[118] Paulu (1981), pp. 139–41.

[119] Paulu (1981), p. 139–42.

[120] Paulu (1956), pp. 195, Paulu (1981), p. 141.

[121] The BBC has, in fact, at various times had an advisory body called the Scientific Advisory Committee, but its function has been to advise the technical departments of the BBC on engineering matters relating to broadcasting. It has not been concerned with science broadcasts.

[122] In the pre-War period, Lord Rutherford was on the General Advisory Council. Following his death, his place was taken by Sir William Bragg. WAC R51/523/4, memo 18 December 1943.

[123] Stuart Hood, quoted in Paul (1981), p. 140.

[124] Gorham (1952), pp. 74–5.

2.9 Constitutional position and public service broadcasting

John Reith was the British Broadcasting Company's Managing Director and later the Corporation's first Director General (1927–38). Throughout his period as Managing Director, Reith was uncomfortable with the quasi-commercial nature of the Company. Although Reith was adamant in a 1924 publication that there was no conflict of interest between the status of the BBC as a commercial company and its roles as a 'public utility service' (the term 'public service broadcaster' was not yet attached to the BBC), he conceded that on any rational view this commercial connection would arouse suspicion.[125] His conception of public service, however, entailed independence from both business and government.[126] The BBC's eventual conversion from Company to Corporation was precipitated by financial difficulties. These led to a review of the financial basis of the organisation by the Sykes Committee, which began meeting in 1923.

The Sykes Committee was the forum in which the issue of the BBC's independence was first raised in a significant way. One of the BBC's grievances, aired in the Sykes Committee, was that the Post Office was doing little to prevent licence evasion among the listeners. Many listeners declined to buy a licence, which meant that the BBC was losing income.[127] Other listeners were exploiting a legal loophole by buying the licence intended for experimenters, and constructing radio sets from imported kits. This reduced the sales of sets manufactured by member companies of the BBC, and consequently reduced the BBC's income from the royalty charged on new sets. Yet another grievance was the radio interference from amateur broadcasters.[128]

In the course of the Committee's discussions, the BBC sought clarification over whether its own licence to broadcast also conferred on it a monopoly of broadcasting, and whether the Postmaster General could interfere with its output. On the latter point, the verdict of the Post Office's solicitor was that the BBC was subject to common law, but could broadcast political speeches or religious matters if it wanted to.[129] Already, however, the BBC had fallen foul of the Postmaster General by broadcasting controversial views from guest speakers. The BBC complained that its position was vulnerable as the Postmaster General could decline to renew the

[125] Briggs (1961), p.215

[126] Briggs (1961), p.215

[127] At this time the BBC only received 50% of the 10-shilling licence fee, the other 50% being retained by the Post Office and the Government. (Briggs, 1961, p. 117).

[128] Briggs (1961), pp.133–6.

[129] Briggs (1961), pp.151–3.

BBC's licence to transmit. Another member of the Sykes committee pointed out that some sections of the public did not trust a private company (which the BBC was) to be unbiased.[130]

The BBC's autonomy, and other troubling issues, were not satisfactorily resolved, from Reith's point of view, by the Sykes committee in 1923. Reith felt that the Company's status as an independent, trustworthy broadcaster was compromised in a number of directions: by its vulnerability to licence non-renewal by the Post Office, by its status as a private company, and by government-imposed restrictions on what it could broadcast. An idea floated during early meetings of the committee was that of a Broadcasting Board which would organise broadcasting 'in the public interest', but this proposal did not proceed any further.[131]

The following year, 1924, Reith published a book entitled *Broadcast over Britain*. It amounts to a manifesto for Reith's version of public service broadcasting, although at no point is 'public service broadcasting' defined.[132] What Reith describes, to a great extent, is what he was already doing, or trying to do, with the British Broadcasting Company. The conception of public service broadcasting adopted by the BBC as a company, and continued as a corporation, was almost entirely the work of John Reith himself[133]. Reith writes in his book of the 'high conception of the inherent possibilities of the service'.[134] For Reith, the high-conception of broadcasting was to be realised in a number of ways. One was through the provision of what he and his staff, albeit with the benefit of advisory committees, thought best for the listeners. In acknowledging the apparent arrogance of this attitude, Reith shows that there was little doubt for him that the hierarchy of cultural values he sought to promote was securely grounded:

> It is occasionally indicated to us that we are apparently setting out to give the public what we think they need – and not what they want, but few know what they want, and very few what they need. [...] In any case it is better to over-estimate the mentality of the public, than to under-estimate it.[135]

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130 Briggs (1961), p. 156.

131 Briggs (1961), p.159.

132 Reith does not use the exact term 'public service broadcaster', but refers to the British Broadcasting Company as a 'public service', which was 'catering for the public interest' (Reith, 1924, p.57).

133 Burns (1977), p.36

134 Reith (1924), p.32

135 Reith (1924), p.34

In a later book, Reith was to refer to his programme policy as one of 'elevating as well as entertaining'.[136] The approach is paternalistic. It eschews commercial motivation, or the market, and 'entertainment' is tolerated as a route to higher intellectual satisfactions: through popular music, listeners might be encouraged to develop a taste for serious music. Reith also speaks in his 1924 book of the many social benefits that broadcasting can bring if done as a public service. One of these is creating a better informed citizenry, who will thus be able to exercise their democratic rights more responsibly.[137] Reith was writing at a time when the extension of the franchise to women aged 30 and older was a recent event (1918), and when moves to lower the age of women's suffrage below 30 were afoot. (These bore fruit in 1929.) The flowering of adult education at the BBC in the late 1920s and early 1930s was symptomatic of the same concern, as was the development of documentary film making.[138]

The official acknowledgement of the BBC's role as a public service broadcaster came with the company's change of status from a company to a corporation on 1 January 1927, on the recommendation of the Crawford Committee, which met in 1925.[139] During the deliberations of the Crawford committee, the options of transferring the service to direct management by the state or of funding it commercially were rejected. The major recommendation of the committee's report, after strong lobbying from Reith, was that broadcasting should be conducted by a public corporation. The Corporation's Charter, which appeared as a result of the Crawford committee, specified that the new authority would broadcast 'in the national interest'.[140] This was the first appearance in official documents of this phrase. However, the meaning of 'national interest' remained undefined in the report. The term presupposes that there is a national interest, but the BBC's Charter leaves unclear what sort of interest it is, whether economic, educational, intellectual, political, cultural, or spiritual.

Although public service broadcasting in the UK was largely the invention of Reith, his conception was related to broader cultural trends present in the UK at the time broadcasting began. Burns identifies a prevailing concern among intellectuals in the early twentieth century with the potentially corrupting influence of popular, commercial culture, especially cinema, recorded popular music and the popular

136 Reith (1949), p.299

137 Reith (1924), pp.18–19

138 Boon (2004).

139 Paulu (1981), pp. 27–8

140 Briggs (1961), p.327

press.[141] However, other early twentieth-century intellectuals, Reith among them, saw in mass media the possibility of widespread cultural improvement, if the media could be harnessed in the right way.[142] LeMahieu sees Reith's concept of public service broadcasting as demonstrating one of the ways in which cultivated élites responded to the growth of popular, commercial culture and writes of them striving to 'enlighten and uplift the tastes of their countrymen.'[143]

The mission to enlighten and to uplift taste, according to LeMahieu, was rooted in the conviction that there was a hierarchy of culture. In this hierarchy, standards were absolute, and knowledge of the status of hierarchical levels was vouchsafed to the educated élite. Thus, opera and serious music were superior to jazz and variety. The élite's task was to wean the public from the popular and towards the refined. Reith's notion of a cultural hierarchy owed much to Matthew Arnold's concept of culture: 'the best that had been thought and written'.[144] Reith considered that the BBC should lead audiences to an appreciation of 'the best'. Le Mahieu's analysis sees public service broadcasting as improving listeners' cultural appreciation and education in order to make them better citizens. It fits naturally with Habermasian ideas of the 'public sphere' and responsible citizenship in a representative democracy.[145] Habermas defines the public sphere as 'a domain of our social life where such a thing as public opinion can be formed'.[146] The public sphere can be accessed, in principle, by all citizens. Habermas sees the concept as having developed in the eighteenth century in the coffee houses frequented by merchants and manufacturers (a somewhat limited section of the citizenry). Garnham has argued that national public service broadcasting created a public sphere, but the proliferation of commercial alternatives has destroyed it.[147]

Taking a different approach, Bailey looks to the effect of public service broadcasting in rendering the population more tractable to being governed. Drawing on the work of Foucault and Bennett, he associates Reithian public service broadcasting with the concept of 'governmentality'.[148] Governmentality relates to the factors that render a

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141 Burns (1977), p.38

142 Bailey (2007), p. 100.

143 LeMahieu (1988), p.103.

144 Quoted in Gregory and Miller (1998), p.48.

145 Butsch (2007), pp. 1–14; Scannell (1992), p.318.

146 Habermas (1996), p. 55.

147 Garnham (1992), p.362.

148 Bailey (2007), p. 97–9; Foucault (1991); Bennett (1992).

population governable – aside from the ones conventionally cited in political analysis, such as power and sovereignty. One factor in governmentality is culture, which was held in the nineteenth and early twentieth centuries to have a civilising effect. Public service broadcasting, by extending to popular masses cultural resources that had hitherto only been enjoyed social élites, makes the population at large more governable.[149] Public service broadcasting, then, is seen as 'a technology of cultural governance', alongside public museums, parks, galleries, and libraries.[150]

In both of the points of view outlined above, the importance of 'culture' is clear, taking 'culture' as both a set of shared attitudes and goals, and as a set of aesthetic and recreational resources associated with social élites. How science fits into Reith's view of culture is difficult to establish. Reith had practised as engineer before joining the BBC, having been coerced into an engineering apprenticeship by his father following an undistinguished school career.[151] As a result, he did not attend university, and in particular did not attend Oxford or Cambridge. According to LeMahieu this left him with a sense of being an outsider and with 'an outsider's exaggerated respect for the arts.'[152] LeMahieu's diagnosis is borne out by Reith's book *Broadcast Over Britain*. In its 230-odd pages, there are short chapters on the enormous potential of the new medium for music, literature, religion, and general education, but only a single sentence refers to the potential of the new medium for covering science.[153] In his later book, *Into the Wind*, Reith similarly says nothing about science – unlike religion and music, about which he has much to say.

2.10 Public corporations

A recurring mischaracterisation of the BBC, particularly by critical commentators (but not exclusively by them), is that it is a state broadcasting organisation of the British government. American scholar Squier, for example, refers to the mixture of commercial and non-commercial radio broadcasting in contemporary Britain as a duopoly allowing for two sorts of ownership: 'state-owned and private ....', implying that British non-commercial broadcasting is state-owned.[154] In fact, constitutionally the BBC is an unusual type of organisation even in Britain, so confusion over its

149 Bailey (2007), p. 97–9.

150 Bailey (2007), p. 97–9.

151 McIntyre (2004)

152 LeMahieu (1988), p.114).

153 'Talks on popular lines by eminent scientists, physicists, chemists, astronomers, have already been found eminently acceptable.' (Reith, 1924, p.152)

154 Squier (2003), p.12.

status in relation to the government and the state is probably to be expected. It is useful to clarify what kind of organisation the BBC is.

'Incorporation', in the context of businesses, means creating a legal entity that is separate from the people who run it or own it. This legal entity can own property, employ staff, have bank accounts, be taxed and fined etc., in much the same way as an individual can.[155] The entity might be either a company or a corporation.[156] For companies, the various Companies Acts lay down how they are created and their legal obligations. Corporations, however, although they may be subject to parts of company law, come into existence either by Royal Charter or by Act of Parliament. Corporations are usually created because a government wants a body that is more independent than a government department would be, but less independent than a company would be.[157] Other examples of corporations are the British Waterways Board, the Port of London Authority and the Royal Mint.[158]

In principle, a corporation has a perpetual existence, and can only cease to exist by law. The BBC, however, is unusual among corporations in having a charter with limited duration, subject to periodic renewal by Parliament.[159] Generally, the BBC's charters have had a duration of 10–15 years, and towards the end of this time a committee of enquiry has customarily been set up to review the terms under which the BBC operates. The report of the committee usually bears on whether the government will renew the charter, and if so, what the charter's terms will be. The reports issued by these committees of enquiry have often signalled major changes in official broadcasting policy. For instance, the Ullswater Committee's report (1935) led to a charter renewal in 1937 which endorsed the BBC's overseas broadcasting, although the BBC had already been broadcasting to foreign countries for some time.[160] In the early 1960s, the report of the Pilkington Committee advocated the BBC's opening of a second television channel (BBC2) and its development of local radio.[161] Committees of enquiry associated with charter renewal take evidence from interested parties. Thus, for an organisation or individual wishing to influence BBC broadcasting policy, charter renewal provides a forum in which representation can be

155 Norkett (1986), pp. 6–7.

156 Norkett (1986), pp. 6–7.

157 Norkett (1986), pp. 6–7.

158 Norkett (1986), pp. 6–7.

159 Briggs (1979), pp. 22–5

160 Paulu (1981), p. 376.

161 Paulu (1981), p.11

made. However, the relative infrequency of the process makes this at best a medium- to long-term strategy.

Corporations do not have shareholders; instead they usually have governors. For most of the BBC's existence it has had a Board of Governors, appointed by the King or Queen on the advice of Government ministers.[162] The number of Governors on the Board of Governors has fluctuated, and by the year 2000 was around twelve. In 2007, following the most recent Charter renewal, the Board of Governors was replaced by a Board of Trustees. However, for the period covered by this thesis, the Board of Governors was the relevant body at the head of the BBC, and I shall add nothing further about the new Board of Trustees.

The Board of Governors 'controlled' BBC policy, but had a non-executive function.[163] Traditionally the Governors have been 'trustees of the national interest in broadcasting', but the interpretation of 'national interest', has varied with the constitution of the Board. [164] The Director General(DG) was immediately responsible to Board of Governors.[165]

As finally published, the BBC's first Charter and related documents required the corporation to broadcast official announcements by government departments.[166] In addition, the Government had power of veto over BBC broadcasts, and in a state of emergency BBC facilities could be taken over by Government..[167] Other restrictions on the Corporation remained in force from its earlier existence as a private company. The BBC could not broadcast its own opinions on matters of public policy, nor on political, industrial or religious controversy.[168] These restrictions were lifted in 1928.[169] The Charter did not grant the BBC a monopoly, although the BBC was understood by all concerned to have a monopoly, and Reith fought hard and unsuccessfully for the BBC to be officially granted a monopoly during the deliberations of the Crawford committee.[170]

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162 Briggs (1971), p.13–8

163 Briggs (1971) p. 14

164 Briggs (1971), pp. 17–22.

165 Briggs (1971), p. 14.

166 Paulu (1981), pp. 30–1.

167 Paulu (1981), p. 31.

168 Scannell and Cardiff (1991), pp. 23–38

169 Scannell and Cardiff (1982), p. 172.

170 Briggs (1961), pp.328–9.

2.11 Privileged BBC departments

Since the BBC's earliest days there have been areas of broadcasting that have enjoyed special privileges, in the sense that they were treated differently from, and sometimes more favourably than, most other subjects on the BBC. In the following sections I will look at these 'privileged' areas. The purpose of this examination, however, is not simply to concentrate on privileged areas of broadcasting, but also to look at types of relationships formed between the BBC and outside organisations for programme creation, and also at the way control was distributed between the BBC and these outside organisations.

Music

The Music Department was founded in 1923, and staffed mainly by musicians.[171] From 1925 the Department had a committee of outside music advisors exclusively drawn from British music-education establishments, and by the mid-1920s, *Radio Times* had a Music Editor.[172]

'Music' here means western serious 'classical' music. Popular forms, such as dance music and jazz, were not the province of the BBC's Music Department.[173] The high status of classical music reflected the common assumption among the cultivated élite in the late nineteenth and early twentieth century that this was one of the highest forms of culture, and ought to be more widely appreciated. However, Reith is reputed to have acknowledged that his favourite music was in a more popular vein: Vincent Youman's musical *Hit the Deck*.[174] The musical inclinations of other high-ranking officials within the BBC also lay in other directions than the ones the Corporation channelled listeners along .[175] The BBC's belief in the cultural value of music is therefore not necessarily simply the expression of the tastes of its own managers.

Music (of all kinds) has dominated the BBC's output almost from the beginning. In October 1925, for example, 67% of the 249 hours of broadcasting contained music.[176] Music programming could draw on an abundant supply of material, using performers who had already learned the material and were used to performing it. Talks, on the other hand, were nearly always newly created. Aside from an

171 Doctor (1999), pp. 59, 80, 81.

172 Doctor (1999), pp. 61 and 66.

173 Scannell (1981), p. 243.

174 LeMahieu (1988), p.152.

175 LeMahieu (1988), p.152.

176 Doctor, (1999), p.39.

abundance of supply, music, according to Reith, was a type of listening the majority of the radio audience was predisposed towards.[177] In the sample broadcasting schedules dotted throughout this thesis, music will be seen to dominate. However, the sort of music administered by the BBC's Music Department (that is, 'classical' music) has always remained a minority interest among radio audiences, listened to by typically 1% or less of the radio audience.[178] It appears, then, that in this area at least the BBC has been unable to force its listeners (or its own staff) into developing a taste for fare they find uncongenial.

Of particular significance to this thesis is the fact that the relationship of the BBC Music Department to the wider musical world has been fraught. In the later 1920s and for much of the 1930s the BBC's Music Department was at loggerheads with the BBC's Music Advisory Committee. This Advisory Committee, created in 1927 and staffed by outside musicians,[179] attempted to influence the Department's artistic decisions in a way that, for the BBC, went beyond the proper function of an advisory committee. The Music Advisory Committee argued that the BBC should promote mainly British music and musicians.[180] Staff in the Music Department found this encroachment on their professional competence intolerable. As result, the Committee was dissolved in 1929, and reconstituted with a different membership. However, the arguments continued during the next decade.[181] As with the earlier Music Advisory Committee, the members of the reconstituted Musical Advisory Committee wanted to see the interests of the British music profession promoted by the BBC. This was to be achieved by devoting more broadcasting time to music by British composers, and played by British performers. Some members of the Music Advisory Committee, in addition, regarded staff in the Music Department as not competent for their work, and demanded that practising, professional musicians should participate in programme planning.[182] The BBC's Music Department, however, regarded itself as under no obligation to favour the British music profession. In its view, its primary obligation was to the maintenance of musical quality.[183]

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177 Reith (1924, p.173.

178 LeMahieu (1988), p.187.

179 Pegg (1983), p.96.

180 Kenyon (1981), p.11.

181 Doctor (1999), p.62.

182 Doctor (1999), p.234.

183 Doctor (1999), pp.232–3.

The Music Department did make some concessions to the Music Advisory Committee. A small Advisory Panel of professional musicians, selected by the Music Department, was set up to advise Adrian Boult (the BBC's Musical Director) and the programme planners, an arrangement which proved satisfactory.[184] However, the Music Advisory Committee itself was not satisfied, and when the Ullswater Committee took evidence on the BBC's work in 1935, the Incorporated Society of Musicians (ISM), some of whose members were on the Music Advisory Committee, recommended that more statutory power be given to external musical advisors to control what happened with the Corporation regarding music.[185] Furthermore, the ISM recommended that one of the BBC's Board of Governors be a music specialist who would be responsible to the Board of Governors for the BBC's music policy.[186] The BBC's Music Department, in particular in the person of Adrian Boult, vigorously defended itself against the alleged shortcomings that the ISM's proposals were designed to rectify. The report of the Ullswater Committee contained no recommendations that were in line with those submitted by the ISM.

Given that interventions from scientists are discussed later in this thesis, it is worthwhile summarising the main features of these musical interventions.

1 An outside professional body was involved, the Incorporated Society of Musicians.

2 Programme planning in music was regarded by the interventionists as to some degree the proper function of their profession, rather than that of the broadcasting profession.

3 A proposal was advanced for a high ranking member of the music profession to be installed in the BBC to supervise broadcasting in the area concerned.

4 'National interest' was cited by the outside music body as an argument for its proposals.

5 The music body that lobbied the BBC did so on behalf of one faction within music, not on behalf of the whole profession. The ISM was a conservative faction within a profession where there were also progressives.

184 Doctor (1999), p.240.

185 Doctor (1999), p.302.

186 Doctor (1999), p.302.

Religion

From the start of broadcasting, John Reith regarded religion as a special area of broadcasting, to which special considerations applied. In his book *Broadcast over Britain* Reith justified the place of religion in the schedules by referring to the universality of religion.[187] However, despite these appeals to universality, the importance attached to religious broadcasting was a reflection of Reith's personal inclinations.[188]

However, what was meant by 'religion', as far as broadcasting was concerned, was Christianity. Reith pointed out that the established status of Christianity in the UK gave it a special position, although the BBC did not associate itself with any denomination.[189] The special status of Christianity in the early BBC was justified, in the end, not by reference to the Church of England as the established church of the country, but by Reith's personal conviction.[190] Reith was known for his piety.[191] For early listeners, one manifestation of the high regard for religion in the BBC was the sombre listening fare on Sundays, when the schedule was given over almost entirely to religiously themed programmes and 'classical' music.[192] The lack of lighter programming prompted some foreign stations from 1933, such as Radio Luxembourg, to beam commercially sponsored English-language programmes to the UK at times when listeners were felt to be most in need of an alternative to the BBC's offerings.[193]

From an organisational point of view, the high status of religion was seen in the early formation of the Central Religious Advisory Committee, in May 1923 – the first of the BBC's advisory councils. By 1931, this Committee had fourteen members, mostly clergymen, representing the major Christian denominations. The function of the committee was to ensure that the spread of broadcast religious speakers and services was fair. This ecumenical approach was the one favoured by Reith, but many influential divines held that the BBC should be less ecumenical, and the matter

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187 Reith (1924), p.191.

188 Briggs (1995a), hp. 211

189 Reith (1924), pp.192 and 194.

190 Reith (1924), p.192.

191 When Reith interviewed R. S. Lambert for an educational post at the BBC, one of the first questions he asked was whether Lambert accepted 'the fundamental teachings of Jesus Christ.' (Lambert, 1940, p.9)

192 Taking Sunday 6 March 1927 as a random example, the broadcasting schedule from *The Times* (for Saturday 5 March 1927) shows that programmes began in the middle of the afternoon, and from then until close down consisted of classical music, news, *Tales from the Old Testament*, *On the Road to El Dorado* (by Rev. Frank Nichol), and a broadcast religious service from the studio.

193 Briggs (1995a) pp. 335–7; Cardiff (1983), p. 382.

of the BBC's approach to religion became highly controversial in the early 1930s.[194] The Central Religious Advisory Committee itself, however, operated with a high level of unanimity.[195] The BBC's ecumenical philosophy did not extend to all groups and sects. Fundamentalists, Freethinkers, Unitarians, Mormons and Christian Scientists were not given air time, nor was the National Secular Society.[196]

In 1933, the first Director of Religious Broadcasting, Rev. F. A. Iremonger, was appointed, although the idea of having a supervisor of religious broadcasts went back to 1926. Iremonger had held a variety of ecclesiastical posts prior to his BBC appointment, and he later became Dean of Lichfield. Reith appointed him not because of pressure from outside the BBC, but because of Iremonger's ecclesiastical ecumenical outlook.[197] On his appointment he became a member of BBC staff. It was not the case, therefore, that the BBC's religious provision was entrusted to someone outside the Corporation.[198]

In view of the scientific interventions to be described later, it is worth re-iterating that the high status of religion within the BBC was not justified by reference to an audience demand (or even by reference to a deficit in the audience's appreciation). Instead, it was accorded a high status through personal conviction of the Director General of its importance in the BBC's output, as was music.

Schools

Schools broadcasting developed from unpromising early attempts at educational broadcasting for schools made around 1927.[199] The transformation of the service from faltering beginnings to a successful and much used service was largely due to Mary Somerville, a recruit to the BBC in the mid-1920s. She took a particular interest in experimental schools broadcasting in 1927.[200] Following a year-long experiment in Kent during that year, a report on the experiment proposed setting up a system to ensure continuous liaison between the BBC and several bodies with a concern for education, specifically the Board of Education, the Local Education

194 Briggs (1995a), pp.221–3.

195 Briggs (1995a), pp.221 and 223.

196 Briggs (1995a), pp.223 and 224.

197 Briggs (1995a), pp.224–6.

198 Briggs (1995a), p.225.

199 Briggs (1995a), pp. 177–81

200 Briggs (1995a), pp.180–1

Authorities, and the teaching profession.[201] This proposal was realised in February 1929 with the setting up of the Central Council for School Broadcasting (CCSB), which replaced the earlier National Advisory Committee on Education. The CCSB planned the schools programmes, and the BBC made them. Thus firm links with outside professional bodies were built into the system from very early days. The membership of the CCSB consisted of nominees of the Board of Education, local education authorities, and teachers' associations and unions. It also included subject specialists and officials of the BBC. Its constitution was devised by a small committee which also contained non-BBC staff.[202]

The CCSB was quite different in function from the several advisory councils the BBC had, and was to have. Its network of subcommittees devised educational programmes on various topics. There were subcommittees for geography, history, modern languages, English literature, music and science.[203] Advisory Committees, by contrast, had no role in devising programmes. A number of innovative programmes emerged from the subcommittees of the CCSB. However, the system of subcommittees became unwieldy, and the interdisciplinary approaches the BBC hoped to see developing failed to materialise.[204] Concerning the control exercised by the CCSB, however, there was no misgiving. Reith commented in 1932: 'The machinery for ensuring that the Council should control the educational content of the programmes and pamphlets was apparently satisfactory ...'[205]

Modifications were made to the CCSB to streamline its working, and also to set up the CCSB as a more autonomous body, with more separation from the BBC. Reith commented that he favoured giving the Council as much autonomy as possible because 'the BBC is not a recognised educational instrument'.[206] However, the BBC retained over-riding powers.[207]

Although the CCSB planned school broadcasts, the BBC remained the final arbiter – the ultimate gatekeeper – as the following extract from the Council's minutes shows:

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201 Briggs (1995a), p.182.

202 Briggs (1995a), pp.182–3.

203 Briggs (1995a), p.183.

204 Briggs (1995a), p.185–6.

205 Briggs (1995a), p.185–6.

206 Quoted in Briggs (1995a), p.194.

207 Mary Somerville, quoted in Briggs (1995a), p.194.

> It was decided that there was a place in the teaching of natural science for broadcast lessons of three different kinds
>
> (a) agriculture and horticulture
>
> (b) seasonal lessons on natural history designed to promote observation
>
> (c) biology and physics applied to everyday life
>
> It was decided to ask the BBC's permission to plan the next year's programme on the assumption that there should be three periods a week devoted to science instead of two as at present.[208]

BBC schools broadcasts were differentiated in the schedules from mainstream broadcasts. In this respect they were quite different from adult education broadcasts during the 1920s and 30s, which were integrated into mainstream broadcasting, and were expected to form part of most listeners' radio diet.

This brief survey shows that within the BBC there has been a long history of treating certain subjects or areas of broadcasting in a special way. For instance, Music and Religion were allocated their own subject-specific departments, and Schools broadcasting allowed an unusually high degree of external control. In the case of Music and Religion, the special status accorded these subjects reflect John Reith's personal convictions. The special status of Schools broadcasting reflects an acknowledgement that this area of the BBC's output complemented existing national educational arrangements.

Summary of Chapter 2

This chapter has highlighted a number of crucial concepts. One of these is autonomy, which was associated with Reith's conception of the BBC. Autonomy is also associated with professions in general, including the broadcasting profession. In broadcasting, autonomy is part of the ideology of the profession, and professionalism itself is part of the way in which occupational identity is constructed.

Professions have paradigm-like conceptions of the world and their own place in it. Professional jurisdictions are perpetually in dispute. In the case of the BBC there is a body of work showing that the Corporation has been subject to encroachment on its jurisdiction and autonomy, mostly by government departments but also, in the 1930s, by the musical profession. One of the purposes of such interventions was to influence the gatekeeping process by which material was selected for broadcasting. At an

[208]WAC R6/161, minutes of meeting, 25 October 1929.

institutional level, influence from outside the BBC is mediated through a range of advisory councils, which have no executive power.

Public service broadcasting as invented by Reith was paternalistic, and associated with cultural enlightenment and responsible citizenship. Scholars have seen it as a form of Habermasian public sphere.

Chapter 3 Pre-war science broadcasting

This chapter is the first of the historical chapters in the thesis, based mainly on unpublished archive documents. It looks at science broadcasting from the beginning of the BBC to the outbreak of war in 1939. Scientific interventions of the kind that dominate the rest of this thesis do not figure largely in this chapter. Instead, the chapter concentrates on the main BBC producers associated with science talks in this period: Hilda Matheson, Mary Adams and Ian Cox. By looking at the work of these producers and their ways of working I intend to show principally what was likely to be at stake in a challenge to the BBC's professional jurisdiction in science broadcasting. My examination will look at these producers' professional concerns, their autonomy, and their views of their role in relation to audiences and scientists. The chapter ends with a brief look at a contrasting example of pre-war science broadcasting – in the USA.

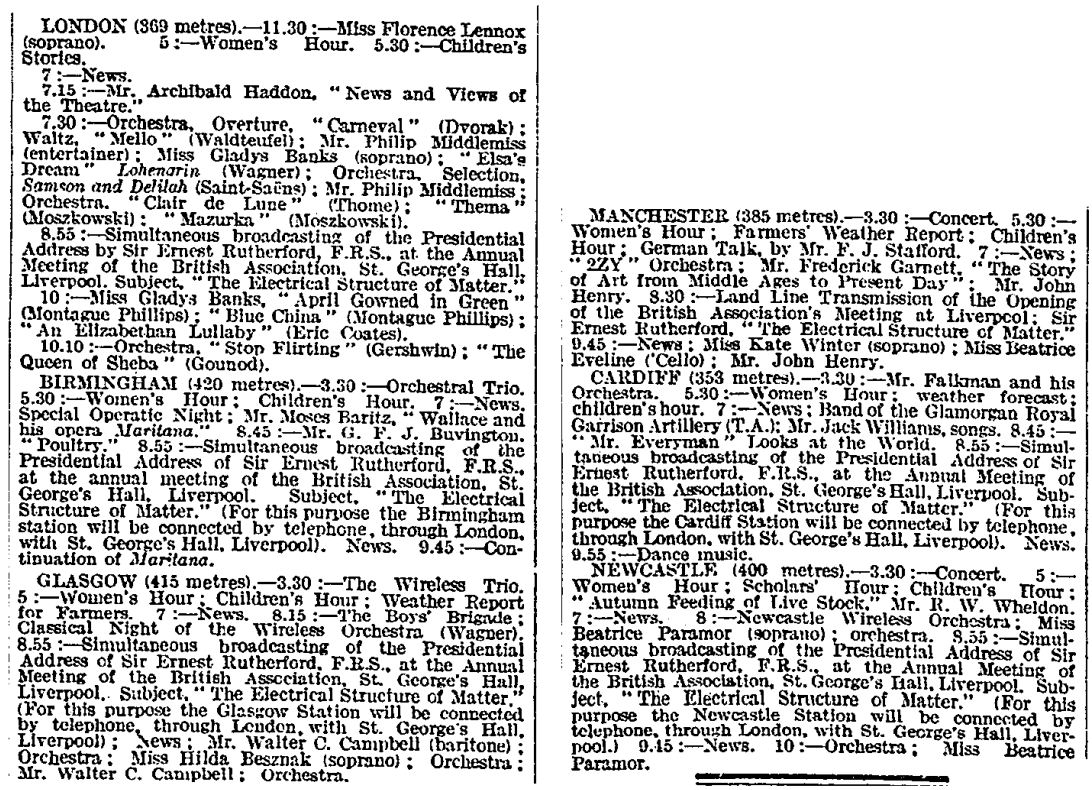
3.1 Hilda Matheson and J. G. Crowther

Science broadcasting by the BBC is almost as old as the organisation itself. On 17 May 1923 Sir Frank Dyson (Astronomer Royal) spoke on *Astronomy*, and on 5 February 1924 he spoke on the *Standardisation of Time*. On 12 September 1923, Sir Ernest Rutherford's talk to the British Association on the nature of the atom was broadcast nationally using the new development of 'simultaneous broadcasting', which enabled transmitters outside London to carry the London programme live.[1] The schedule in Figure 3.1 shows the broadcast being carried by the city-based transmitters which were, at this time, the usual way of disseminating radio programmes.

William Bragg, though, was probably the first scientist to gain a reputation for broadcasting excellence.[2] Bragg came to John Reith's attention as a potential broadcaster following his successful series of public Christmas lectures *On the Nature of Things* at the Royal Institution in 1923. Reith invited him to the broadcast, and in the spring of 1924, he gave a series of talks on air with the same title as his Royal Institution Christmas lectures.

1 Hennessy (2005), p.282.

2 Friday (1974), p. 59



LONDON (369 metres).—11.30 :—Miss Florence Lennox (soprano). 5 :—Women's Hour. 5.30 :—Children's Stories.
7 :—News.
7.15 :—Mr. Archibald Haddon, "News and Views of the Theatre."
7.30 :—Orchestra, Overture, "Carneval" (Dvorak); Waltz, "Mello" (Waldteufel); Mr. Philip Middlemiss (entertainer); Miss Gladys Banks (soprano); "Elsa's Dream" *Lohengrin* (Wagner); Orchestra, Selection, *Samson and Delilah* (Saint-Saëns); Mr. Philip Middlemiss; Orchestra. "Clair de Lune" (Thome); "Thema" (Moszkowski); "Mazurka" (Moszkowski).
8.55 :—Simultaneous broadcasting of the Presidential Address by Sir Ernest Rutherford, F.R.S., at the Annual Meeting of the British Association, St. George's Hall, Liverpool. Subject, "The Electrical Structure of Matter."
10 :—Miss Gladys Banks, "April Gowned in Green" (Montague Phillips); "Blue China" (Montague Phillips); "An Elizabethan Lullaby" (Eric Coates).
10.10 :—Orchestra, "Stop Flirting" (Gershwin); "The Queen of Sheba" (Gounod).

BIRMINGHAM (420 metres).—3.30 :—Orchestral Trio. 5.30 :—Women's Hour; Children's Hour. 7 :—News. Special Operatic Night; Mr. Moses Baritz, "Wallace and his opera *Maritana*." 8.45 :—Mr. G. F. J. Buvington. "Poultry." 8.55 :—Simultaneous broadcasting of the Presidential Address of Sir Ernest Rutherford, F.R.S., at the annual meeting of the British Association, St. George's Hall, Liverpool. Subject, "The Electrical Structure of Matter." (For this purpose the Birmingham station will be connected by telephone, through London, with St. George's Hall, Liverpool). News. 9.45 :—Continuation of *Maritana*.

GLASGOW (415 metres).—3.30 :—The Wireless Trio. 5 :—Women's Hour; Children's Hour; Weather Report for Farmers. 7 :—News. 8.15 :—The Boys' Brigade; Classical Night of the Wireless Orchestra (Wagner). 8.55 :—Simultaneous broadcasting of the Presidential Address of Sir Ernest Rutherford, F.R.S., at the Annual Meeting of the British Association, St. George's Hall, Liverpool. Subject, "The Electrical Structure of Matter." (For this purpose the Glasgow Station will be connected by telephone, through London, with St. George's Hall, Liverpool); News; Mr. Walter C. Campbell (baritone); Orchestra; Miss Hilda Besznak (soprano); Orchestra; Mr. Walter C. Campbell; Orchestra.

MANCHESTER (385 metres).—3.30 :—Concert. 5.30 :—Women's Hour; Farmers' Weather Report; Children's Hour; German Talk, by Mr. F. J. Stafford. 7 :—News; "2ZY" Orchestra; Mr. Frederick Garnett, "The Story of Art from Middle Ages to Present Day"; Mr. John Henry. 8.30 :—Land Line Transmission of the Opening of the British Association's Meeting at Liverpool; Sir Ernest Rutherford, "The Electrical Structure of Matter." 9.45 :—News; Miss Kate Winter (soprano); Miss Beatrice Eveline ('Cello); Mr. John Henry.

CARDIFF (353 metres).—3.30 :—Mr. Falkman and his Orchestra. 5.30 :—Women's Hour; weather forecast; children's hour. 7 :—News; Band of the Glamorgan Royal Garrison Artillery (T.A.); Mr. Jack Williams, songs. 8.45 :—"Mr. Everyman" Looks at the World. 8.55 :—Simultaneous broadcasting of the Presidential Address of Sir Ernest Rutherford, F.R.S., at the Annual Meeting of the British Association, St. George's Hall, Liverpool. Subject, "The Electrical Structure of Matter." (For this purpose the Cardiff Station will be connected by telephone, through London, with St. George's Hall, Liverpool). News. 9.55 :—Dance music.

NEWCASTLE (400 metres).—3.30 :—Concert. 5 :—Women's Hour; Scholars' Hour; Children's Hour; "Autumn Feeding of Live Stock," Mr. R. W. Wheldon. 7 :—News. 8 :—Newcastle Wireless Orchestra; Miss Beatrice Paramor (soprano); orchestra. 8.55 :—Simultaneous broadcasting of the Presidential Address of Sir Ernest Rutherford, F.R.S., at the Annual Meeting of the British Association, St. George's Hall, Liverpool. Subject, "The Electrical Structure of Matter." (For this purpose the Newcastle Station will be connected by telephone, through London, with St. George's Hall, Liverpool.) 9.45 :—News. 10 :—Orchestra; Miss Beatrice Paramor.

Figure 3.1 Broadcast schedule for 12 September 1923, as printed in *The Times*, p. 8 (columns rearranged). Schedules for city-based transmitters are shown. At 8.55, nearly all stations are shown relaying Sir Ernest Rutherford's address to the British Association

In the next few years, as the adult education output of the BBC developed, the science output increased. Among the more celebrated scientific broadcasters were physicist J. Arthur Thomson (twenty broadcasts between1925 and 1932), psychologist Cyril Burt (around forty broadcasts from 1927 to 1933), physicist Oliver Lodge (over fifteen broadcasts between 1923 and 1934) and zoologist D'Arcy Wentworth Thompson (six broadcasts in May and July 1927).[3] Not all science broadcasters were so eminent; many talks were given by figures who are now all but forgotten.

These science talks came under the aegis of the BBC's Talks department, which from 1926 to 1931 was directed by Hilda Matheson. She was recruited to the BBC in 1926,[4] initially as an assistant to the Head of Education, later becoming Head of Talks – a position she held until her departure.[5] Matheson had formerly been secretary to Nancy Astor, Britain's first woman MP, and was known for her left/liberal sympathies. Prior to that, during the First World War, she had worked in intelligence in London and Rome.[6] At the BBC, Matheson used her political contacts to bring eminent figures such as H. G. Wells, George Bernard Shaw and Harold Nicholson to the microphone.[7]

In December 1926, Matheson received a six-page letter proposing radical changes to the BBC's science broadcasting from James Gerald Crowther (usually referred to as J. G. Crowther).[8] Crowther, born in 1899, had assisted the physiologist A. V. Hill during the latter part of the First World War in experimental work on anti-aircraft guns. In 1919 he commenced his undergraduate study of mathematics at Trinity College Cambridge, but dropped out after one term, subsequently taking up a variety of teaching posts and being drawn to left-wing politics. [9]

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3 Statistics in this paragraph are my own compilations.

4 Carney (1999), p.23.

5 Hunter (2004).

6 Carney (1999), p.10.

7 Hunter (2004)

8 WAC J. G. Crowther file, memorandum from Crowther to Matheson 6 December 1926.

9 Gregory (2006)

Figure 3.2 Talks Director Hilda Matheson, from Carney (1999)

In 1924 Crowther became a scientific publisher's representative for Oxford University Press, and in 1926 (the year that he wrote to Matheson) he began to publish short, topical science items in the *Manchester Guardian,* initially anonymously. In the space of a few years, science popularisation, through articles and books, became his principal occupation, and remained so until his retirement.[10]

Crowther's letter to Matheson, which I discuss below, was not his first contact with the BBC. In 1925 he had approached the Editor of *Radio Times*, Walter Fuller, to suggest the inclusion of a weekly science page in *Radio Times*, and to propose himself as its editor. The role Crowther envisaged for himself was similar to that of *Radio Times*'s recently appointed Music Editor in relation to music. Fuller encouraged Crowther, and the *Radio Times* Science Page project progressed as far as the creation of a typeset dummy page in September 1926, shown in Figure 3.3.[11] Crowther described the main components of his page.[12] The largest item was to be a 600-word abridgement of a science talk due for broadcast in the forthcoming week, condensed 'in such a way that it will not spoil the speaker's points by anticipation'. At the bottom right of the page would be answers to readers' queries, with book recommendations. At the top left would be a 200-word editorial usually dealing with 'the BBC's efforts to foster interest in scientific affairs', beneath which were 'Science News and Notes'.

The Science Page project came to a halt with the sudden death of Fuller in September 1927. Fuller's successor at *Radio Times* did not pursue the idea, and no Science Page was published.

[10] Gregory (2006) and Crowther (1970).

[11] Crowther Archive (Sussex University), Box 159, has correspondence relating to Crowther's proposed *Radio Times* page and several copies of the dummy page. An attached printer's compliments slip dates them to September 1926.

[12] Crowther Archive (Sussex University), Box 159, draft letter, Crowther to Fuller, 12 September 1926.

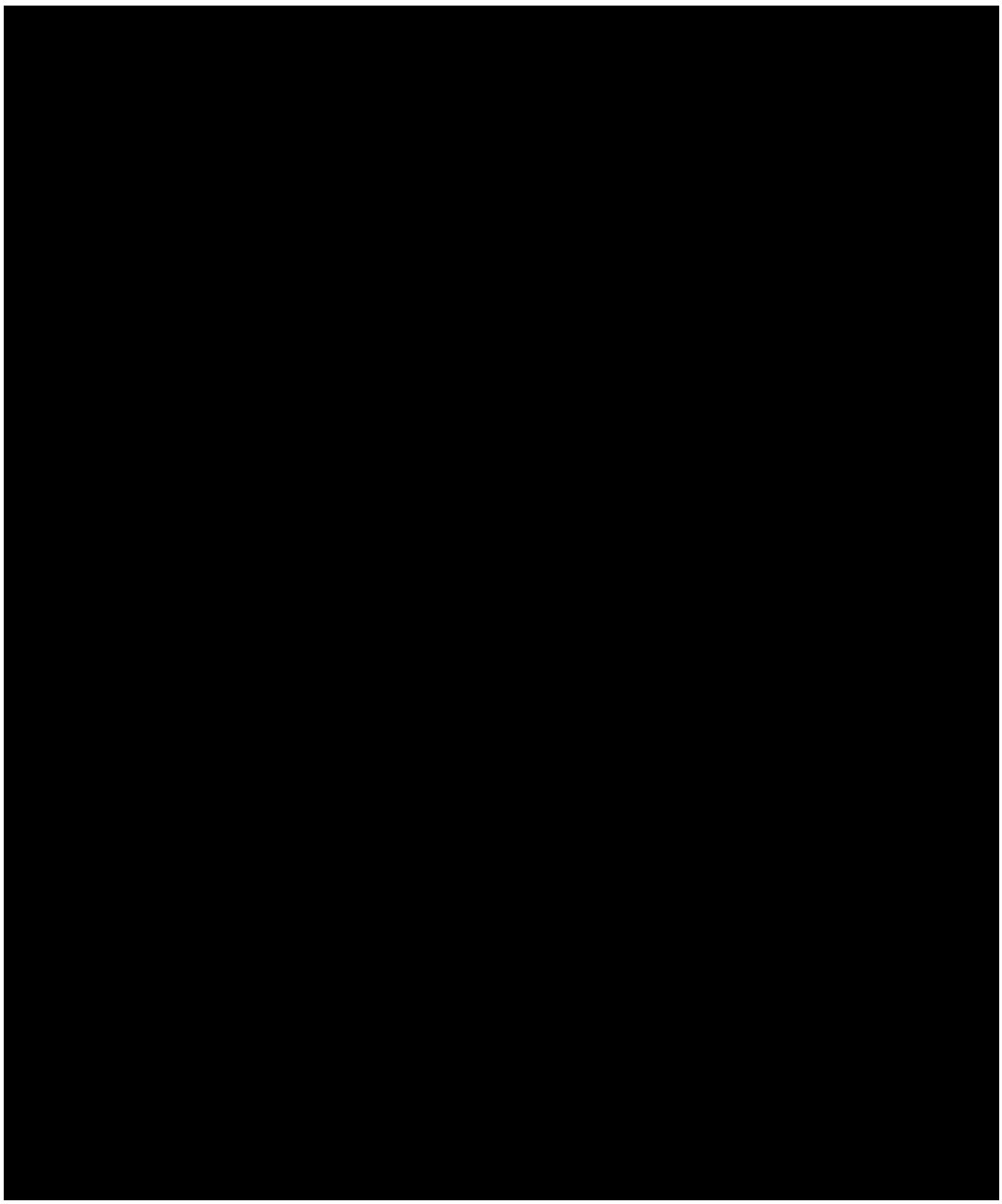

Figure 3.3 J. G. Crowther's 1926 dummy science page for *Radio Times.* (Crowther Archive)

Crowther's dummy Science Page shows how science might have been presented if he had had his way. It portrays the world of science as a superior realm. Listeners should support science whole-heartedly, and if they did so would be amply rewarded:

> If the body of radio-listeners firmly resolve, in return for past services, that science shall hold the place of honour in modern thought, many of the problems which beset modern life will disappear, for these problems would rapidly be solved if science were resolutely applied to them.

Crowther reveals here the vision that Edgerton associates with 'futurism' (see Chapter 1) – the sense that the present is the start of a new epoch in which science will resolve countless problems, and for which science deserves special regard.

Possibly Crowther indulged his enthusiasm for science in his dummy page more than he would have in a published item. Nevertheless, his view of the special importance of science revealed in the Science Page is consistent with the extract quoted in Chapter 1 from his 1928 book *Science for You*, in which he spoke of a knowledge of science as 'one of the necessities of the hour'. In the same book Crowther wrote that: 'The public should be made to realize that their own existence is largely the result of the application of science to the old domestic manufacturing arts ...' [13] Crowther's implicit cosmology (in Mary Douglas's sense of the term outlined in Chapter 2) is one where the structural and economic importance of science in the modern world is invoked as an ultimate justification for according science higher status in the public consciousness. Furthermore, there is no sense here of applied science being a separate realm of science from pure science. Rather, the central importance of science is evidenced by its suffusion of modern life.

Crowther's six-page letter to Matheson observed that science programming was unsystematic.[14] It did not follow a syllabus designed to develop a progressive understanding of a subject in the listeners. According to Crowther, talks should be planned coherently, and graded according to the degree of knowledge assumed of the audience.[15] Instead of isolated talks, there should be series designed to give progressive coverage of a scientific discipline. Crowther pointed out that he himself was well suited to manage a centralised science production department, and he cited his many contacts in the scientific world, his teaching experience, his writing, and his

[13] Crowther (1928), p.vii, 235.

[14] WAC J. G. Crowther file, memorandum from Crowther to Matheson 6 December 1926.

[15] WAC J. G. Crowther file, memorandum from Crowther to Matheson 6 December 1926.

attendance at meetings of the British Association for the Advancement of Science.[16] Crowther was in effect arguing for an elaborated system of formal education by radio lectures, designed to take listeners progressively through a subject. His letter goes on to suggest programmes and speakers. There were to be talks on the place of science in farming, bridge-building, food preparation, and the cleaning of cities, as well more theoretical, research-based and historical presentations. Potential speakers were to be found among 'the great experimenters in the Cavendish Laboratory'; and listeners would be able to perform experiments at home 'under the direction of such masters of experiment as, for example, Sir William Bragg, FRS.'[17] Listeners were framed as being directed by authoritative figures from the scientific world.

Hilda Matheson responded to Crowther by saying that the BBC had no place for a science specialist, but that the position might change when the BBC had sufficient wavelengths to offer alternative simultaneous programming (that is, two services operating simultaneously, which started to happen around 1930, with the introduction of the Regional service). However, to her colleagues, Matheson was sceptical. In a handwritten note to Crowther's letter she said: 'Almost everyone is interested in science when it's shoved under their noses. But I think not quite so much as this man suggests'.[18] Matheson's cosmology was thus based her own finely judged understanding of what the audience could accept.

Crowther's proposals were not taken up. A Science Department was not created, nor was he offered a job at the BBC. Following his 1926 letter, he plied Matheson with cuttings of his newspaper articles and ideas for talks he could give. His persistence bore fruit a year later, when Matheson was planning three short monthly astronomical talks entitled *Stars of the Month*. She asked Crowther to recommend a speaker, or to consider doing it himself. He volunteered.[19] The broadcasts went out in January, February and March 1928. They were among the earliest instances of scientific broadcasts on the BBC by a science populariser rather than by a practising scientist.

Subsequent events suggest that Crowther's broadcasting style did not suit some members of the scientific world. Following the first broadcast, Matheson received two letters from 'eminent astronomers' complaining that Crowther's talk contained inaccuracies.[20] On being told of these letters, Crowther assured Matheson that his scripts had been vetted by the Astronomer Royal, Sir Frank Dyson. This was true of

16 WAC J. G. Crowther file, memorandum from Crowther to Matheson 6 December 1926.

17 WAC J. G. Crowther file, memorandum from Crowther to Matheson 6 December 1926.

18 WAC J. G. Crowther file, memorandum from Crowther to Matheson 6 December 1926.

19 Crowther Archive (Sussex University), Box 159, Matheson to Crowther, 16 November 1927.

at least one script.[21] However, Dyson's response to another script (probably the second) suggests that he and his associates found it problematic:

> I have consulted several members of my staff but they are not willing to revise your MS for BBC. They say, and I concur in this, that what you write may be quite correct, but cannot be put in the form in which they themselves would give it, without a good deal of rewriting and altering the emphasis.[22]

Dyson's objection, then, was not that Crowther was inaccurate, but that his approach was not one the scientists themselves would have used. For this reason the scientists withdrew their co-operation.

For his third script, Crowther appears to have turned for advice to physicist Herbert Dingle, who made some corrections but cautioned: 'The final point seems to me to be all wrong because of the wrong direction given at the beginning.'[23] It is not clear, in this case, whether accuracy was the issue. An equally plausible interpretation is that, once again, the objection was to style rather than content.[24]

Crowther received no further work from Hilda Matheson. She entrusted a series of astronomical talks later in 1928 to Sir James Jeans, although in her view he was not a good broadcaster.[25] Broadcasting merit, then, was not always paramount, but was a factor to be weighed, or traded with others, in choosing a speaker. Being a gatekeeper could require the comparison of incommensurable qualities. In this case. scientific authority appears to have counted for more than popularising skill, as Jeans was favoured over Crowther despite, in Matheson's eyes, his limitations as a broadcaster. Ironically, Jeans's 1928 broadcasts proved popular with listeners, and were subsequently published as the book *The Universe Around Us*.[26] This suggests

[20] WAC, J. G. Crowther file, letter from Matheson to Crowther, 13 January 1928. The 'eminent astronomers' are unnamed.

[21] Crowther Archive, Box 159, letter from Dyson to Crowther, 2 December 1928.

[22] Crowther Archive, Box 159, Dyson to Crowther, 18 January 1928.

[23] Crowther Archive, Box 159, Dingle to Crowther, 24 February, 1928.

[24] The physicist Herbert Dingle notoriously became a renegade from relativity. However, it is unlikely that his objection to Crowther was due to a putative pro-relativistic tone in Crowther's script. Chang (1993, p. 743) dates Dingle's dissent from relativity to 'at least 1939 and lasting until is death in 1978,' eleven years after his criticism of Crowther's script. Prior to that, Dingle had himself been a populariser of Einstein's work (Chang, 1993, p.743).

[25] WAC, Crowther file, Matheson's annotations on letter from Crowther to BBC, 6 December 1926. Despite Jeans's shortcomings as a broadcaster, his series on astronomy in the autumn of 1928 proved extremely popular with listeners, and was published in 1929, with additional material, as *The Universe Around Us*. (Matheson, 1933, p. 243).

[26] Matheson (1933), pp. 243–4.

that Matheson's judgement of listeners' taste in science broadcasts was not entirely secure.

The episode of Crowther's astronomy broadcasts, with scientific experts asserting their authority, resonates with the 'dominant model' view of science popularisation. Crowther, who had himself wanted to establish scientific authority at the BBC by creating a Science department and by giving managerial power to scientists, was on the receiving end of scientific authority as approval was withdrawn from his work. In terms of Gieryn's work, he saw himself rapidly transported across the science boundary from insider to outsider.

Whatever the misgivings of professional scientists (and possibly Matheson) about Crowther's broadcasts, two listeners at any rate were moved to express their appreciation:

> Last Monday week I was a delighted listener-in to you in your fascinating lecture entitled Stars of the Month.[27]

and

> May I take the liberty of sending a line to say how much I enjoyed your brief talk on Stars of the Month at 6.15 today? I shall certainly try to hear you talk next month.[28]

In 1928, at a talk given at the British Association for the Advancement of Science meeting in Glasgow, J. C. Stobart, Director of the Education Department of the BBC, spoke on 'Wireless in the Service of Education'. His address mentioned the BBC's success in promoting an appreciation of 'educational talks, general and specific, good music, religious features, literature, etc.' He also mentioned grand opera, literary plays and readings, and topical talks, which were 'selected so as to give an understanding of current problems in politics, economics etc. and to keep listeners in touch with progress and achievement in every line of human activity.'[29] Science is not mentioned once, despite the fact that Stobart was addressing the British Association.

Stobart's talk was an instance of a tendency among BBC managers (and John Reith himself) to overlook science when reflecting on BBC output. The evidence of the BBC's output shows that science was not neglected. I will demonstrate this shortly,

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[27] Crowther Archive, Box 159, letter from Jennings to Crowther, 12 January 1928.

[28] Crowther Archive, Box 159, 'A Listener' to Crowther, 2 January 1928.

[29] Stobart (1929).

but first it is necessary to appreciate the growing importance of adult education during the second half of the 1920s. From the start, Reith had seen the BBC's public service remit as having a strong educational thrust. The significance of adult education was boosted by the publication in 1928 of *New Ventures in Broadcasting*, subtitled 'A Study in Adult Education'. This was the report of a committee of enquiry, chaired by Sir Henry Hadow, Vice Chancellor of Sheffield University.[30] The report concluded that broadcasting had an important role in adult education:

> it can widen the field from which students are drawn... it can provide a means of education for those beyond the reach of other agencies; it can put listeners in touch with the leaders of thought and the chief experts in many subjects; and it can lead on to more intensive study.[31]

Although the report largely endorsed what the BBC was already doing, two initiatives followed in its wake. These were

- the establishment in 1929 of the BBC's weekly journal *The Listener*, which reprinted a selection from each week's broadcasts;
- the setting up around the country of listening groups which would meet to listen to and discuss broadcasts.

From 1930 to 1935 *The Listener* had a 'Science Notes' column supplied by the chemist A. S. Russell.[32] Inspection shows this was less elaborate than Crowther's proposed science page for *Radio Times*.

At this period, adult education broadcasts were transmitted at prime listening times, such as early evening, and were intended to appeal to all listeners. The adult education 'year' was divided into three twelve-week terms. Figure 3.4 shows a plan of a term's-worth of adult-education broadcasts, from April to July 1930. It is taken from the published syllabus covering that period.[33] (Syllabuses were published three time per year.)

One of the first points to appreciate from Figure 3.4 is the nature of the broadcasts given, which in many cases do not have equivalents in mainstream broadcasting today. In most cases the programmes are given by scientists, literary figures or

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30 In the 1920s and early 30s Hadow chaired a number of other committees concerned with national education policy. His 1926 report *The Education of the Adolescent* recommended a change of schooling for children around the age of 11 or 12 from junior school to what became known as secondary school, although this seems to have been confirmation of existing practice rather than new policy. (Hearnshaw, 1979, p. 113–5)

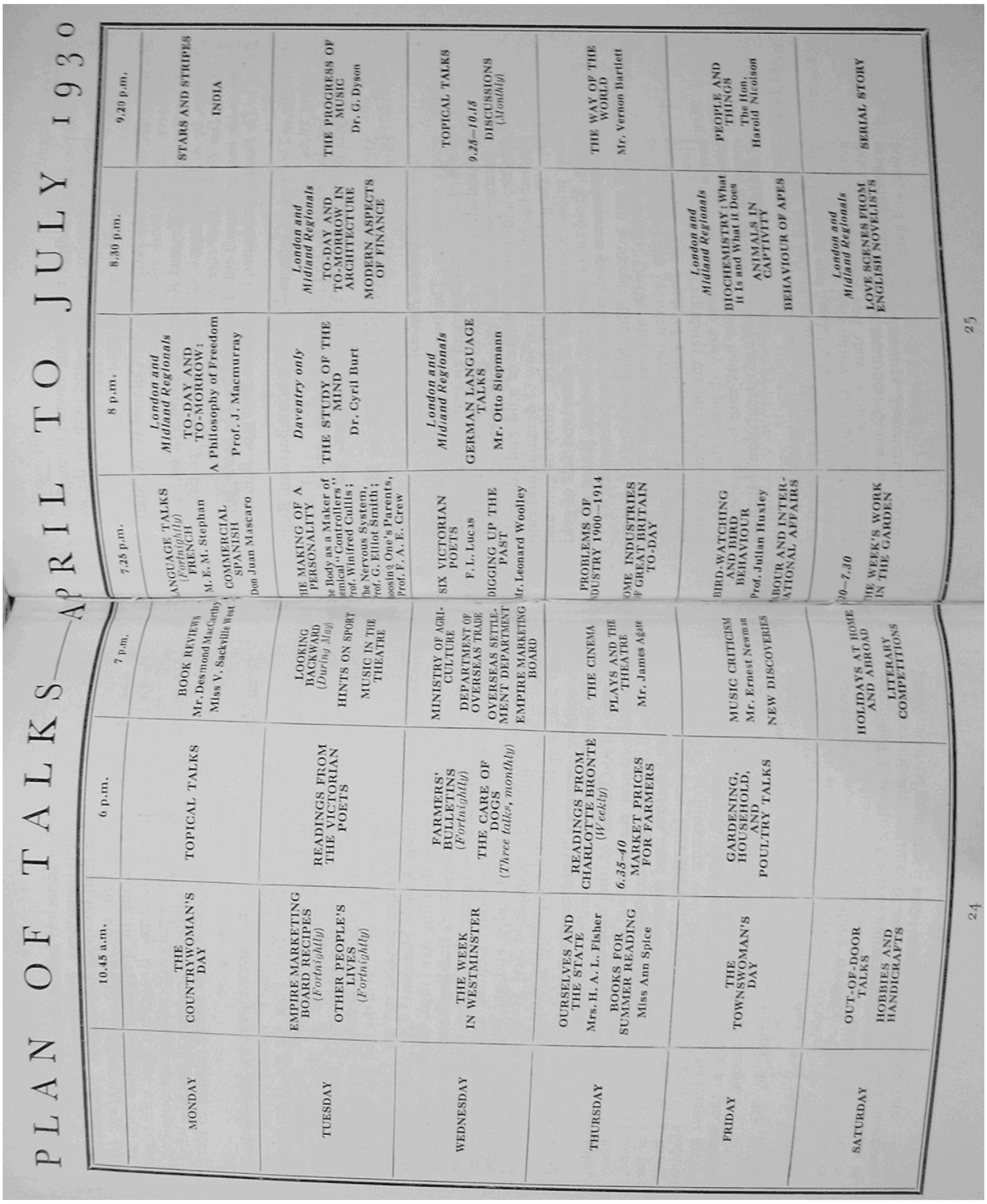
31 Hadow (1928), p. 87.

32 Desmarais (2004), p. 14.

33 BBC (1930)

academic figures themselves, unmediated by interviewers, journalists or interpreters. Julian Huxley, Cyril Burt, James Agate and Harold Nicolson are clear examples. A second point to notice is that the programmes are for the most part not related to contemporary issues or research. This is unsurprising given the origination of most of these broadcasts in the Adult Education area of the BBC. However, these broadcasts were intended to be of general interest to all listeners, not just to those who were actively following them as adult education students.

Figure 3.4 shows how broadcasts were distributed in an adult education 'term'. Each box in Figure 3.4 represents 12 weeks' worth (i.e. a term's worth) of broadcasting at a particular time. There are 35 boxes containing programme material, so the total number of talks in the period covered is $12 \times 35 = 420$.



PLAN OF TALKS—APRIL TO JULY 1930

	10.45 a.m.	6 p.m.	7 p.m.	7.25 p.m.	8 p.m.	8.30 p.m.	9.20 p.m.
MONDAY	THE COUNTRYWOMAN'S DAY	TOPICAL TALKS	BOOK REVIEWS Mr. Desmond MacCarthy Miss V. Sackville West	ANGUAGE TALKS *(Fortnightly)* FRENCH M. E. M. Stephan COMMERCIAL SPANISH Don Juan Mascaro	*London and Midland Regionals* TO-DAY AND TO-MORROW: A Philosophy of Freedom Prof. J. Macmurray		STARS AND STRIPES INDIA
TUESDAY	EMPIRE MARKETING BOARD RECIPES *(Fortnightly)* OTHER PEOPLE'S LIVES *(Fortnightly)*	READINGS FROM THE VICTORIAN POETS	LOOKING BACKWARD *(During May)* HINTS ON SPORT MUSIC IN THE THEATRE	HE MAKING OF A PERSONALITY e Body as a Maker of emical "Controllers"; rof. Winifred Cullis; he Nervous System, rof. G. Elliot Smith; oosing One's Parents, Prof. F. A. E. Crew	*Daventry only* THE STUDY OF THE MIND Dr. Cyril Burt	*London and Midland Regionals* TO-DAY AND TO-MORROW IN ARCHITECTURE MODERN ASPECTS OF FINANCE	THE PROGRESS OF MUSIC Dr. G. Dyson
WEDNESDAY	THE WEEK IN WESTMINSTER	FARMERS' BULLETINS *(Fortnightly)* THE CARE OF DOGS *(Three talks, monthly)*	MINISTRY OF AGRICULTURE DEPARTMENT OF OVERSEAS TRADE OVERSEAS SETTLEMENT DEPARTMENT EMPIRE MARKETING BOARD	SIX VICTORIAN POETS F. L. Lucas DIGGING UP THE PAST Ir. Leonard Woolley	*London and Midland Regionals* GERMAN LANGUAGE TALKS Mr. Otto Siepmann		TOPICAL TALKS *9.25—10.15* DISCUSSIONS *(Monthly)*
THURSDAY	OURSELVES AND THE STATE Mrs. H. A. L. Fisher BOOKS FOR SUMMER READING Miss Ann Spice	READINGS FROM CHARLOTTE BRONTË *(Weekly)* *6.35–40* MARKET PRICES FOR FARMERS	THE CINEMA PLAYS AND THE THEATRE Mr. James Agate	PROBLEMS OF DUSTRY 1900—1914 OME INDUSTRIES F GREAT BRITAIN TO-DAY			THE WAY OF THE WORLD Mr. Vernon Bartlett
FRIDAY	THE TOWNSWOMAN'S DAY	GARDENING, HOUSEHOLD, AND POULTRY TALKS	MUSIC CRITICISM Mr. Ernest Newman NEW DISCOVERIES	BIRD-WATCHING AND BIRD BEHAVIOUR Prof. Julian Huxley BOUR AND INTER-ATIONAL AFFAIRS		*London and Midland Regionals* BIOCHEMISTRY: What it Is and What it Does ANIMALS IN CAPTIVITY BEHAVIOUR OF APES	PEOPLE AND THINGS The Hon. Harold Nicolson
SATURDAY	OUT-OF-DOOR TALKS HOBBIES AND HANDICRAFTS		HOLIDAYS AT HOME AND ABROAD LITERARY COMPETITIONS	*30—7.30* HE WEEK'S WORK IN THE GARDEN		*London and Midland Regionals* LOVE SCENES FROM ENGLISH NOVELISTS	SERIAL STORY

24 25

Figure 3.4 Plan of Talks for April–July 1930, from BBC (1930)

Talks were usually presented in series of twelve or six thematically linked talks. For example, Figure 3.4 shows that on Tuesdays at 7.25 p.m. there was a series entitled *The Making of a Personality*. This series comprised twelve weekly talks broadcast from Tuesday 29 April to Tuesday 15 July 1930. The plan also shows that the slot on Fridays at 7.25 p.m. was split between *Bird-watching and Bird Behaviour* and *Labour and International Affairs*. *Bird-watching and Bird Behaviour* comprised the first six talks in this slot, transmitted from Friday 2 May to Friday 6 June, and this series was followed by the six *Labour and International Affairs* broadcasts, from Friday 13 June to Friday 18 July. The fact that the split was an equal one is established from other parts of the *Syllabus*. Splits could be organised in other ways too. For example, the slot on Fridays at 7 p.m. was split between *Music Criticism* and *New Discoveries* (a topical science series). In this case the two programmes alternated, each appearing fortnightly through the twelve week period. Splits could also be unequal, with say, eight broadcasts being on one subject and the remaining four being on another.

The table illustrates some of the difficulties of estimating how much of the BBC's output was 'scientific'. One problem is deciding what counts as scientific. For example, some of the talks shown are clearly psychological, but might be regarded as scientific. The series *Digging up the Past* (Wednesday, 7.25) concerned archaeology, and might have had some scientific content. Similarly, the series *Some Industries of Great Britain Today* (Thursday, 7.25) might have had some scientific content.

To arrive at an estimate of the amount of science broadcasting in this term, I have chosen to count as scientific programmes those relating to discovery, mathematics, physics, chemistry and biology, as well as any relating to the mind and natural history. On that basis, the following broadcasts count as scientific: *New Discoveries* (6 broadcasts), *The Making of a Personality* (12 broadcasts), *Bird-watching and Bird Behaviour* (6 broadcasts), *The Study of the Mind* (12 broadcasts), *Biochemistry* (4 broadcasts), *Animals in Captivity* (4 broadcasts) and *Behaviour of Apes* (4 broadcasts). That gives a total of 48 science broadcasts, which, as a percentage of the total in this period (420), is about 11.5%. It is immediately evident from the above list that what I choose to call scientific consists largely of topics outside the physical sciences, and is to a large degree constituted by psychology and natural history.

For comparison, literary talks in the table comprise *Book Review* (12 broadcasts), *Readings from the Victorian Poets* (12 broadcasts), *Six Victorian Poets* (6 broadcasts), *Readings from Charlotte Bronte* (6 broadcasts) and *Love Scenes from English Novelists* (12 broadcasts), again totalling 48 broadcasts, or 11.5% of the total.

Other cautions need to be taken into account when trying to estimate output of science talks (or any other kind of talk) in this way. One is that this method relates only to broadcasts during term time within the adult education scheme. Outside term time, and outside the adult education programme, there might well have been other science (or literature) talks, but they are missed. Another caution is that this method ignores relevant material from other departments than Talks, and output that might only have been limited to particular regions.

Figure 3.4 indicates indirectly the scale of the broadcasting operation as a whole. To elaborate this point a little, I have shown that Figure 3.4, representing a single term's worth, consisted of 420 talks. A year's worth therefore amounted to three times this, or 1260 separate broadcasts. There were also talks not associated with adult education to be planned and created, and also non-Talks output (such as drama and music). Broadcasting also happened through the afternoon, and for part of the morning, and by 1930 there was a Regional service in addition to the National service. These considerations show that within ten years of the commencement of broadcasting, the BBC output was vast. A producer employed in the pre-war Talks department wrote of producing talks at the rate of 400 a year.[34]

Hilda Matheson left the BBC in 1931/2. Her departure has been interpreted variously as a consequence of her being difficult to work with[35] or of Reith's capitulation to conservative critics outside the BBC[36]. In 1933 she published *Broadcasting*, in which she set out her thoughts on the new medium.[37] There are chapters on literature and drama, music, entertainment, and education, but science, as a broadcasting subject, is confined to a paragraph on the popularity of astronomy, as demonstrated by the publication, mentioned earlier, of Sir James Jeans's 1928 astronomy broadcasts as the book *The Universe Around Us*, and a paragraph on the popularity of Sir Oliver Lodge with listeners.[38] Matheson's virtual ignoring of science in her book is another instance of the tendency, also found with Stobart in his address to the British Association in 1928, for managers to overlook this significant part of BBC output.

Following publication of her book, Matheson became a contributor to, and secretary of, the editorial team of *An African Survey*, published by Oxford University Press in 1938. During 1939/40, she worked for the Joint Broadcasting Committee, a small

[34] Bloomfield (1941), p.183.

[35] Briggs (1995a), pp. 133–4.

[36] Hunter (2004)

[37] Matheson (1933).

[38] Matheson (1933), pp. 243–4.

organisation independent of the BBC which produced scripts and recordings of pro-Allied propaganda for distribution to radio stations abroad. She died in October 1940, at the age of 52, during an operation to remove part of her thyroid gland as a remedy for Graves disease, from which she had suffered for some time.[39]

Matheson's departure from the BBC in the early 1930s did not significantly alter the Talks Department's style in the short term. Her successor, Charles Siepmann, who had joined the BBC in 1927 and moved up through the ranks of Adult Education,[40] increased the size of the department, bringing in several new producers with socially progressive views.[41]

An incident from around the time of Matheson's departure gives an insight into John Reith's thinking on the special skills and responsibilities of the broadcaster. During a visit to New York in the spring of 1931 to attend an educational conference, he heard of an attempt by educationalists to appropriate radio in the USA for their own purposes. They had demanded that either wavelengths or broadcasting time be handed over to them 'to use as they thought best.'[42] Reith was not in favour:

> To hand over wavelengths or time to people who were not broadcasters was a sin against the principle of good coverage. [43]

For Reith, the problem with the educationalists' demand was that they lacked the skill of broadcasters such as himself and his American colleagues. Part of the broadcaster's skill was the ability to cater for the whole audience, not necessarily within a single broadcast. This was not a matter of dutifully supplying each specialist interest, but a creative process of combining diverse ingredients. Broadcasters were practitioners of 'a unique art'. Non-broadcasters were not.[44] The 'unique art' at the heart of broadcasting lay in the broadcaster's skill in sifting, selecting and combining:

> [Broadcasters] were under the necessity of selecting limited programmes from unlimited material. [45]

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[39] Carney (1999), pp. 114–21, 135.

[40] Briggs (1995a), p.133.

[41] Scannell and Cardiff (1991), pp. 155–6.

[42] Reith (1949), p.145.

[43] Reith (1949), p.146

[44] Reith (1949), p. 146.

[45] Reith (1949), p.146

According to Reith, the mistake non-broadcasters made when they tried to appropriate broadcasting for their own purposes was to think that broadcasting was simply a distribution mechanism. Rather:

> [Broadcasters] should be treated not as publishers, still less as printers, but as editors.[46]

The skill of the broadcaster, then, lay not simply in administering the broadcasting system, but in working creatively with the content: selecting, editing, juxtaposing, rejecting, commissioning, and so on, and fashioning the diverse broadcasting strands into a balanced composition. In short, broadcasters acted as gatekeepers. Furthermore, as the quotation from Reith indicates, broadcasters rejected far more than they accepted. Hence the process of gatekeeping, in this context, incidentally conferred exclusivity on what was chosen. An example of the process at work was Matheson's selection of James Jeans in preference to Crowther, even though she had reservations about his broadcasting skill. The broadcaster had to make judgements, based on a professional assessment.

For Reith, then, broadcasting had its own jurisdiction, and its own skills, which were to a large degree a matter of responsible gatekeeping. Administration of this jurisdiction should only be in the hands of the broadcaster. Only the broadcaster could use the medium responsibly, serving all the interests of the listener by virtue of being unattached any interest group. Broadcasters also knew when the job was done properly. In essence, Reith was staking a claim for broadcasting as a profession, distinct from other professions and occupational groups such as publishers and printers (both entrepreneurial and commercial operations), but similar to publishing editors. Publishing editors too acted as gatekeepers, selecting from a multitude of sources to create a coherent suite of offerings. The role of the professional broadcaster was a high calling, requiring the broadcaster to use the medium responsibly for the benefit of all the listeners. It was also an autonomous role, answerable to no other group for the standard of its performance.

The problem with giving outsiders influence over broadcasting was not simply their lack of requisite professionalism. There was also a danger of factions within a group or occupation claiming to speak for the whole group or occupation.[47] Partisanship, could lead to what Reith referred to as 'ballyhoo':

> There was a risk of educational ballyhoo [...] – an assertion that this labelled brand of culture was the only culture, as this labelled brand of

[46]Reith (1949), p. 146

[47]Reith (1949), p.145.

soap was the only soap. That was not the way to sell goods, material or spiritual, to the radio audience. [48]

'Ballyhoo' would not succeed, according to Reith, because there was a significant fraction of the audience whose starting point was not indifference to the message being promoted, but 'definite aversion'.[49] Reith considered that this was often the part of the audience with most to gain from the broadcast. Hence another virtue of the professional broadcaster was that, by virtue of being detached from factional rivalries, it could cater for all groups. If the medium were appropriated by a faction, it lost credence within other factions. The autonomy of the professional broadcaster, therefore, underpinned the authority and the impartiality of the broadcaster.

3.2 Mary Adams, 1930–6

In the spring of 1928, Mary Adams (1898–1984), a 30-year old biologist with experience in adult education, gave a series of six talks on the BBC on *Problems of Heredity*. In 1930 she joined the BBC as an adult education officer.[50] In the same year she also gave a series of six talks on *Pioneers of Health* and a series of five eugenically themed talks on *A1 or C3? The Future of the Race*. For the next six years she supervised science broadcasting at the BBC, though appears not to have broadcast again herself. She is the first producer whom we know by name to have been regarded as a specialist science producer. However, it appears there were specialist science producers by about 1928, two years before Adams joined the BBC. The evidence for this comes from a note from Matheson to J. G. Cowther in 1928 in which she refers to a science specialism within the Talks Department.[51]

The Adams era was notable for a number of 'science and society' broadcasts, often given by politically left-leaning or liberal scientists, some of them associated with the developing Social Relations of Science movement, for example mathematician Hyman Levy, biologist Julian Huxley and physicist Patrick Blackett. However, not all science broadcasts in this period had this social dimension, and not all science talks were given by left-leaning scientists. One of the broadcasters Adams favoured was the biologist John R. Baker (at least seventeen broadcasts between 1931 and 1935), who was unsympathetic to the Social Relations of Science movement.[52]

[48] Reith (1949), p. 145.

[49] Reith (1949), p. 145.

[50] Adams (2004)

[51] WAC J. G. Crowther Contributor's file. In a letter to Crowther dated 31 February [sic] 1928, Matheson says: 'Regular science talks are not my domain, but I learn from the section responsible for them...'.

[52] In an audio interview recorded in 1972 Baker spoke of the influence of the movement on the British Association for the Advancement of Science: 'The British Association was very much affected by this new

One innovative type of science broadcast introduced under Adams, entitled *Science in the Making*, ran for two series, in 1931 and 1932. Each week, listeners were asked to participate in research activities, albeit of a homely sort. In one broadcast, John R. Baker asked listeners to report when blackbirds laid their first eggs. In another, natural historian and geographer Ivan Margary asked for observations of the time of flowering of the first blackthorn; and physicist Dr John Shaxby conducted perceptual experiments to investigate masking of one sound by another. Nearly 1000 listeners sent in accounts of what they had heard in the broadcast.[53] This style of listener-experimentation is quite different from that envisaged by Crowther in his 1926 letter to Matheson. Whereas Crowther envisaged listeners performing experiments under the direction of eminent scientists, in effect establishing their subordinate role to the distinguished scientist who delivered the broadcast, the style of *Science in the Making* was participative, acknowledging the role of the listener as a potential contributor.

A frequent broadcaster from the Adams period was Gerald Heard (Figure 3.5), by training a historian and theologian. From 1930, he broadcast regularly on topical science matters, first in the fortnightly series *Research and Discovery* and then in *This Surprising World*.[54] The latter series continued to 1934. For *This Surprising World*, Heard drew on advice from a number of scientists and organisations, including (to name a few) Sir William Bragg, Sir Walter Fletcher (of the Medical Research Council) and Sir Richard Gregory (editor of *Nature*)[55]

movement, and at one of their early meetings, it was in 1933, it was evident that a change had come about, namely a change towards the idea that the central planning of science was good, and a second idea, that all science should be devoted towards practical ends.' (Baker 1972).

[53] BBC (1932), pp 170–1.

[54] Moseley (1933), pp. 73–4.

[55] WAC R6/288/1, undated memo. This question of Heard's advisers re-surfaced in the 1940s when the BBC defended its policy of not appointing a scientific advisory committee.

Figure 3.5 Gerald Heard, science populariser and frequent broadcaster from 1930–6. (Picture from www.geraldheard.com)

However, Heard was himself in some respects an adviser to BBC staff, and his comments and suggestions were welcomed. In 1934, Heard, proposed that the psychoanalyst Jung be invited to speak.[56] In the same year, he recommended to a producer that journalist Peter Ritchie Calder (later to be a science populariser) be invited to broadcast.[57] In 1935, Heard was sounded out by a staff member for his views on a proposed new series.[58] Heard therefore, for a time, occupied a border position in relation to the BBC. He was officially an outsider, not being an employee. On the other hand, in terms of actual practice, he was partly an insider and partly an outsider, offering ideas and advice, being consulted for suggestions, giving broadcasts, and so on.

Heard's BBC broadcasting career came to an end with his departure for the USA in 1937, where he remained for the rest of his life, becoming a public intellectual, an early proponent of 'alternative' spirituality and mysticism, and a writer of science fiction.[59] In relation to the BBC and science, Heard was not the only border figure. Around the mid 1930s another was the chemist Henry Tizard, who made suggestions for science programmes that were taken up.[60]

Mary Adams on one occasion praised Heard's performance in an unrehearsed broadcast debate against the motion that 'Life a hundred years ago is preferable to life a hundred years hence'.[61] Adams's note to Heard after the broadcast suggests that his merits as a broadcaster included quickness of perception and forcefulness of expression:

> Just a note to let you know how very brilliant we all thought you were last Saturday. Praise pours in on all sides, and I just want to turn it towards you. I think the way you leapt on to their points was staggering. Thank you very much.[62]

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56 WAC Gerald Heard contributor file, letter from Heard to Mr Salt, received 28 October 1934.

57 WAC, Gerald Heard contributor file, letter from JS (probably Joe Salt) to Heard, 23 November 1934. Salt thanks Heard for the recommendation, and says he might use Calder for the 'Prophesy' [sic] programme. *Radio Times* confirms that Calder, along with other contributors, participated in 'Here are Prophets: a Broadcast Forecast' on 29 December 1934, on London Regional. Calder was later to become a prolific broadcaster.

58 WAC Gerald Heard contributor file, memo from JSAS [Joe Salt?] to Heard 15 November 1935. The author of the letter begins: 'We have got a new series of programmes starting in the spring in which you may be interested and I should very much like your help ...'

59 Falby (2004).

60 WAC R51/523/1, letter from Director of talks to Sir Henry Tizard, Imperial College of Science and Technology, 29 June 1936. WAC R51/523/2, memo 10 June 1937 from Ian Cox to Director of Talks.

61 The broadcast was on 5 October 1935 on the Regional service. The motion was defended by G. A. Street.

62 WAC Gerald Heard contributor file, memo from Adams to heard, 7 October 1935.

Adams's enthusiastic cultivation of Heard shows her shaping of the kinds of science broadcasting she favoured, through her choice of speaker and through programme styles. She found in Heard a kind of dynamism that engaged listeners' attention, and helped form a particular view of science. Her response to Heard can usefully be contrasted with her response to J. G. Crowther, who gave his next BBC broadcast under her supervision. In 1931 Adams saw a short filler item in *Nature* [63] in which an unnamed commentator observed that the tails of sparrows in London appeared to be frequently misshapen. Adams invited Crowther to speak on the matter, but he was reluctant. Adams suggested to Crowther that the sparrow story could appeal to listeners because it had 'human interest', and because it could be used as a peg for introducing weightier evolutionary matters.[64] That is to say, the main business of the talk could be evolution, and the sparrows could merely serve as bait. Crowther remained reluctant, although he eventually did the broadcast, maintaining that scientific exposition ought not to be motivated by 'entertainment'.[65] Adams responded:

> I am afraid bitter experience has shown me that it is only by this round about method that the great B.P. [British Public] will listen to a wireless talk on science.[66]

[63] The story in question is Anon (1931).

[64] WAC Crowther Contributor File, Adams to Crowther, 2 September 1931.

[65] WAC Crowther Contributor File, Crowther to Adams, 3 September 1931. Crowther gave the broadcast, under the title *City Sparrow Economics*, on 22 September 1931 on the National service.

[66] Crowther Archive, Box 159, Adams to Crowther, 7 September 1931.

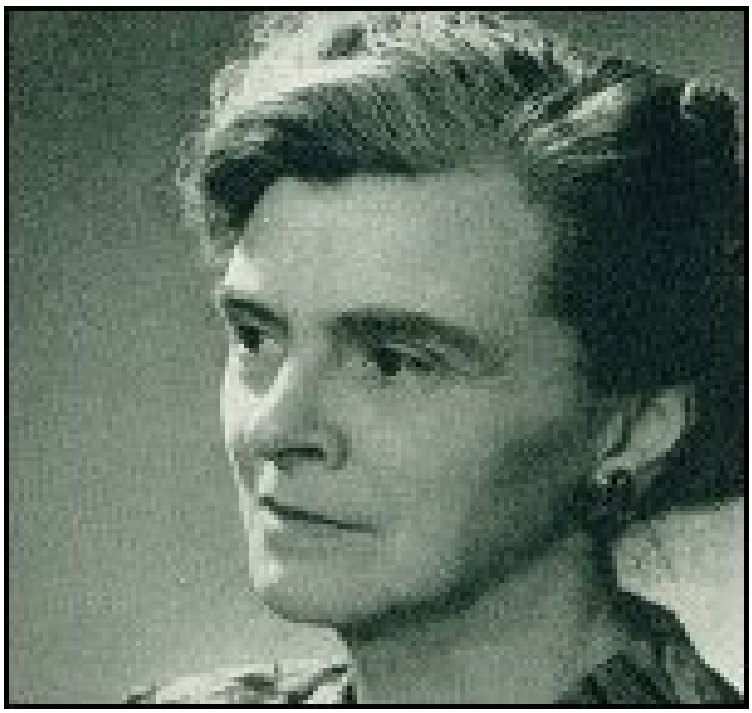

Figure 3.6 Mary Adams, radio science producer in Talks from 1930–6. Except for the duration of the Second World War she spent the remainder of her career in television. Following retirement in 1958 she worked at the Consumers Association[67]

(Picture from www.teletronic.co.uk/herestv8.htm)

[67] Adams (2004)

Adams, therefore, did not see her role as simply one of providing a platform from which scientific experts could deliver their message as they pleased. She shaped the type of message that was delivered through her choice of speaker and through her promotion of certain styles of presentation. This 'framing' role suggest that, for her, science and scientists were the raw materials of science broadcasting. Putting a scientist before a microphone did not by itself constitute science broadcasting. The broadcasting professional had to frame the broadcast through advice, encouragement, advocacy of particular styles of presentation, and other editorial input. As Charles Hill, the BBC 'Radio Doctor' during the Second World War, commented:

> The responsibility for talks rested entirely on the producer of a particular talk or series and, because of the remarkably high quality of producers, the system worked very well.[68]

In one the few published comments about science broadcasting at this period, Adams's colleague Richard Lambert, wrote:

> [Mary Adams] raised high the level of broadcast science talks, through her contacts with scientists at the universities, and her ability to pick out the latest scientific developments and have them presented in a lively and informative way. [...] when she was transferred to Television [1936], the light she had lit in the Talks Department grew dim again.[69]

Lambert highlights Adams's gatekeeping and framing functions – her choice of speakers and topics, and her skill in finding engaging styles of presentation. Lambert implicitly also suggests that her job was one where the incumbent could make a significant difference. That is to say, in her role as a producer, Adams had a degree of autonomy such that the results of her endeavours stood as evidence of her own creative contribution, rather than simply as the implementation of a policy determined elsewhere. Her function, then, was not to be an administrator of broadcasting, but to be a creator of broadcasts, even though she herself was not a speaker by this stage. However, as her correspondence with Heard showed, she drew on advice from non-BBC staff whom she trusted. Charles Hill's remark above about the responsibility for talks resting 'entirely on the producer' does not mean that producers were unaided.

In Autumn 1931 and Spring 1932, Adult Education broadcasts were subsumed under the umbrella title *The Changing World*. The motivation for this was a sense that, in a

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68 Hill (1964), p. 118, quoted in Briggs (1970), p.25.

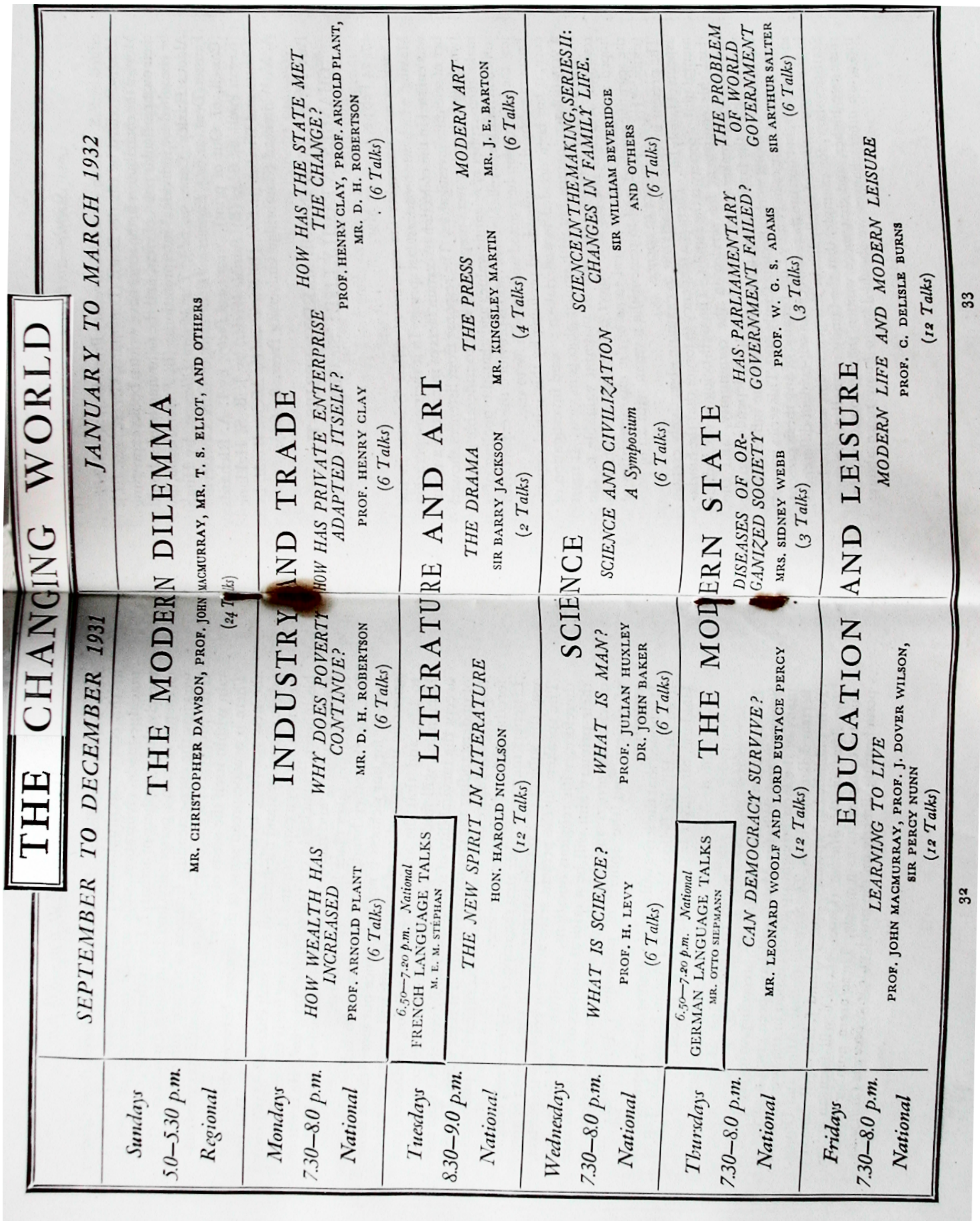
69 Lambert (1940), p.75.

time of economic crisis, some attempt to comprehend the forces at play in the world was required. As the preface to the Talks syllabus put it:

> For some time past a sense of crisis has been abroad, which has led many to wonder what can be the outcome of our present troubles. This perplexity goes to the very roots of life, and affects us, not only in the economic and social sphere, but is all-pervasive, setting its seal on art and upon literature, and upon all expressions of the human spirit. [...] In this programme, an attempt is, therefore, made to face up squarely to the present situation, and to provide a survey of the many changes in outward circumstance, and in the evolution of thought and of values, which have brought into being the world as it is to-day. [70]

The resulting schedule of broadcasts is shown in Figure 3.7. Each of the six horizontal bands contained 24 talks. As science had a band to itself, it comprised one-sixth of the talks, or approximately 17 per cent. The titles of the science series, *What is Science?*, *What is Man?*, *Science and Civilization* and *Science in the Making: Changes in Family Life* again showed a framing of science that was not tied to conventional science disciplines, but rather suggested a reflection on what science meant in contemporary life.

[70]BBC (1931b), pp. 1–2.



THE CHANGING WORLD

SEPTEMBER TO DECEMBER 1931 — JANUARY TO MARCH 1932

Sundays 5.0–5.30 p.m. Regional
THE MODERN DILEMMA
MR. CHRISTOPHER DAWSON, PROF. JOHN MACMURRAY, MR. T. S. ELIOT, AND OTHERS
(24 Talks)

Mondays 7.30–8.0 p.m. National
INDUSTRY AND TRADE
HOW WEALTH HAS INCREASED — PROF. ARNOLD PLANT (6 Talks)
WHY DOES POVERTY CONTINUE? — MR. D. H. ROBERTSON (6 Talks)
HOW HAS PRIVATE ENTERPRISE ADAPTED ITSELF? — PROF. HENRY CLAY (6 Talks)
HOW HAS THE STATE MET THE CHANGE? — PROF. HENRY CLAY, PROF. ARNOLD PLANT, MR. D. H. ROBERTSON (6 Talks)

Tuesdays 8.30–9.0 p.m. National
6.50—7.20 p.m. National — FRENCH LANGUAGE TALKS — M. E. M. STÉPHAN
LITERATURE AND ART
THE NEW SPIRIT IN LITERATURE — HON. HAROLD NICOLSON (12 Talks)
THE DRAMA — SIR BARRY JACKSON (2 Talks)
THE PRESS — MR. KINGSLEY MARTIN (4 Talks)
MODERN ART — MR. J. E. BARTON (6 Talks)

Wednesdays 7.30–8.0 p.m. National
SCIENCE
WHAT IS SCIENCE? — PROF. H. LEVY (6 Talks)
WHAT IS MAN? — PROF. JULIAN HUXLEY, DR. JOHN BAKER (6 Talks)
SCIENCE AND CIVILIZATION — A Symposium (6 Talks)
SCIENCE IN THE MAKING, SERIES II: CHANGES IN FAMILY LIFE. — SIR WILLIAM BEVERIDGE AND OTHERS (6 Talks)

Thursdays 7.30–8.0 p.m. National
6.50—7.20 p.m. National — GERMAN LANGUAGE TALKS — MR. OTTO SIEPMANN
THE MODERN STATE
CAN DEMOCRACY SURVIVE? — MR. LEONARD WOOLF AND LORD EUSTACE PERCY (12 Talks)
DISEASES OF ORGANIZED SOCIETY — MRS. SIDNEY WEBB (3 Talks)
HAS PARLIAMENTARY GOVERNMENT FAILED? — PROF. W. G. S. ADAMS (3 Talks)
THE PROBLEM OF WORLD GOVERNMENT — SIR ARTHUR SALTER (6 Talks)

Fridays 7.30–8.0 p.m. National
EDUCATION AND LEISURE
LEARNING TO LIVE — PROF. JOHN MACMURRAY, PROF. J. DOVER WILSON, SIR PERCY NUNN (12 Talks)
MODERN LIFE AND MODERN LEISURE — PROF. C. DELISLE BURNS (12 Talks)

32 — 33

Figure 3.7 Centre spread of the ‘Changing World’ Adult Education syllabus, 1931/32

In the science strand of 'The Changing World', two of Adams's favoured science broadcasters are shown, Julian Huxley and John Baker. As mentioned earlier, Baker gave some seventeen broadcasts between February 1931 and March 1935; Huxley, who became something of a 'house' scientist for the BBC, being both a radio personality and a member of the Talks Advisory Committee,[71] gave over 30 broadcasts between May 1930 and November 1935. (He gave many other broadcasts before and after this period also.[72])

Invited by Adams to comment on the 1931 series 'The Changing World', J. G. Crowther criticised its:

> .... dreadful atmosphere of 'fair mindedness'. I expect you know far better than I that directness is one of the first qualities in style and until the BBC allows more directness its performances will lack the distinction and sincerity which attract without invoking the 'entertainment' motive.[73]

Crowther's comment on 'fair mindedness' refers to the strategies adopted by producers when dealing with controversial issues. In its earliest years, the Corporation had been forbidden by Parliament from broadcasting on 'controversial' matters.[74] In 1928, the ban was lifted experimentally, following pressure from Reith. Scannell and Cardiff write that there was an understanding in government and among BBC managers that 'this new freedom might be revoked if it was not discharged with due responsibility'.[75]

Adams responded to Crowther's criticism:

> We thought [The Changing World] more frank than some of our previous efforts. But I'm afraid unlike you, I do not object to 'fairmindedness' in principle. It is not possible to compel the listener to hear both 'A' and 'B' holding forth on diametrically opposite opinions, and so, for the present, it seems better to make A plus B broadcast simultaneously.[76]

This was, in fact, one of the preferred ways within the BBC of handling controversy: opposing speakers spoke within the same broadcast, and the BBC endorsed neither

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[71] WAC, R6/204

[72] Figure based on my own compilation of data from BBC records.

[73] WAC Crowther Contributor File, Crowther to Adams, 3 September 1931.

[74] Scannell and Cardiff (1982), p. 171.

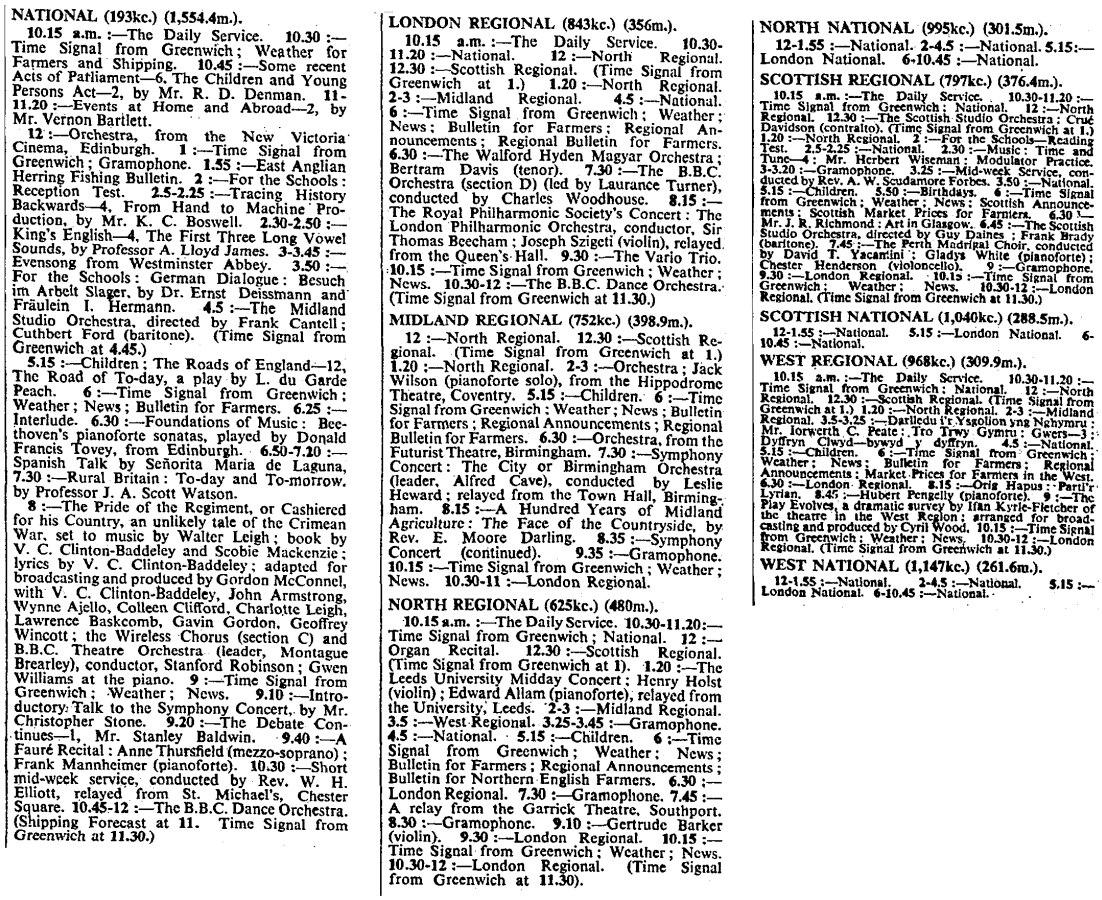
[75] Scannell and Cardiff (1982), p. 172.

[76] Crowther Archive, letter from Adams to Crowther, box 159, 7 September 1931.

view.[77] Crowther's advocacy of unbalanced 'direct' speaking suggests that he did not appreciate the delicacy of the BBC's position.

A later episode, concerning the left-wing mathematician Hyman Levy, shows Adams using framing as a way of coping with controversy.

[77] Scannell and Cardiff (1982), p. 172.



NATIONAL (193kc.) (1,554.4m.).

10.15 a.m. :—The Daily Service. 10.30 :—Time Signal from Greenwich; Weather for Farmers and Shipping. 10.45 :—Some recent Acts of Parliament—6. The Children and Young Persons Act—2, by Mr. R. D. Denman. 11-11.20 :—Events at Home and Abroad—2, by Mr. Vernon Bartlett.

12 :—Orchestra, from the New Victoria Cinema, Edinburgh. 1 :—Time Signal from Greenwich; Gramophone. 1.55 :—East Anglian Herring Fishing Bulletin. 2 :—For the Schools: Reception Test. 2.5-2.25 :—Tracing History Backwards—4, From Hand to Machine Production, by Mr. K. C. Boswell. 2.30-2.50 :—King's English—4, The First Three Long Vowel Sounds, by Professor A. Lloyd James. 3-3.45 :—Evensong from Westminster Abbey. 3.50 :—For the Schools: German Dialogue: Besuch im Arbeit Slager, by Dr. Ernst Deissmann and Fräulein I. Hermann. 4.5 :—The Midland Studio Orchestra, directed by Frank Cantell; Cuthbert Ford (baritone). (Time Signal from Greenwich at 4.45.)

5.15 :—Children; The Roads of England—12, The Road of To-day, a play by L. du Garde Peach. 6 :—Time Signal from Greenwich; Weather; News; Bulletin for Farmers. 6.25 :—Interlude. 6.30 :—Foundations of Music: Beethoven's pianoforte sonatas, played by Donald Francis Tovey, from Edinburgh. 6.50-7.20 :—Spanish Talk by Señorita Maria de Laguna. 7.30 :—Rural Britain: To-day and To-morrow, by Professor J. A. Scott Watson.

8 :—The Pride of the Regiment, or Cashiered for his Country, an unlikely tale of the Crimean War, set to music by Walter Leigh; book by V. C. Clinton-Baddeley and Scobie Mackenzie; lyrics by V. C. Clinton-Baddeley; adapted for broadcasting and produced by Gordon McConnel, with V. C. Clinton-Baddeley, John Armstrong, Wynne Ajello, Colleen Clifford, Charlotte Leigh, Lawrence Baskcomb, Gavin Gordon, Geoffrey Wincott; the Wireless Chorus (section C) and B.B.C. Theatre Orchestra (leader, Montague Brearley), conductor, Stanford Robinson; Gwen Williams at the piano. 9 :—Time Signal from Greenwich; Weather; News. 9.10 :—Introductory Talk to the Symphony Concert, by Mr. Christopher Stone. 9.20 :—The Debate Continues—1, Mr. Stanley Baldwin. 9.40 :—A Fauré Recital: Anne Thursfield (mezzo-soprano); Frank Mannheimer (pianoforte). 10.30 :—Short mid-week service, conducted by Rev. W. H. Elliott, relayed from St. Michael's, Chester Square. 10.45-12 :—The B.B.C. Dance Orchestra. (Shipping Forecast at 11. Time Signal from Greenwich at 11.30.)

LONDON REGIONAL (843kc.) (356m.).

10.15 a.m. :—The Daily Service. 10.30-11.20 :—National. 12 :—North Regional. 12.30 :—Scottish Regional. (Time Signal from Greenwich at 1.) 1.20 :—North Regional. 2-3 :—Midland Regional. 4.5 :—National. 6 :—Time Signal from Greenwich; Weather; News; Bulletin for Farmers; Regional Announcements; Regional Bulletin for Farmers. 6.30 :—The Walford Hyden Magyar Orchestra; Bertram Davis (tenor). 7.30 :—The B.B.C. Orchestra (section D) (led by Laurance Turner), conducted by Charles Woodhouse. 8.15 :—The Royal Philharmonic Society's Concert: The London Philharmonic Orchestra, conductor, Sir Thomas Beecham; Joseph Szigeti (violin), relayed from the Queen's Hall. 9.30 :—The Vario Trio. 10.15 :—Time Signal from Greenwich; Weather; News. 10.30-12 :—The B.B.C. Dance Orchestra. (Time Signal from Greenwich at 11.30.)

MIDLAND REGIONAL (752kc.) (398.9m.).

12 :—North Regional. 12.30 :—Scottish Regional. (Time Signal from Greenwich at 1.) 1.20 :—North Regional. 2-3 :—Orchestra; Jack Wilson (pianoforte solo), from the Hippodrome Theatre, Coventry. 5.15 :—Children. 6 :—Time Signal from Greenwich; Weather; News; Bulletin for Farmers; Regional Announcements; Regional Bulletin for Farmers. 6.30 :—Orchestra, from the Futurist Theatre, Birmingham. 7.30 :—Symphony Concert: The City or Birmingham Orchestra (leader, Alfred Cave), conducted by Leslie Heward; relayed from the Town Hall, Birmingham. 8.15 :—A Hundred Years of Midland Agriculture: The Face of the Countryside, by Rev. E. Moore Darling. 8.35 :—Symphony Concert (continued). 9.35 :—Gramophone. 10.15 :—Time Signal from Greenwich; Weather; News. 10.30-11 :—London Regional.

NORTH REGIONAL (625kc.) (480m.).

10.15 a.m. :—The Daily Service. 10.30-11.20 :—Time Signal from Greenwich; National. 12 :—Organ Recital. 12.30 :—Scottish Regional. (Time Signal from Greenwich at 1). 1.20 :—The Leeds University Midday Concert: Henry Holst (violin); Edward Allam (pianoforte), relayed from the University, Leeds. 2-3 :—Midland Regional. 3.5 :—West Regional. 3.25-3.45 :—Gramophone. 4.5 :—National. 5.15 :—Children. 6 :—Time Signal from Greenwich; Weather; News; Bulletin for Farmers; Regional Announcements; Bulletin for Northern English Farmers. 6.30 :—London Regional. 7.30 :—Gramophone. 7.45 :—A relay from the Garrick Theatre, Southport. 8.30 :—Gramophone. 9.10 :—Gertrude Barker (violin). 9.30 :—London Regional. 10.15 :—Time Signal from Greenwich; Weather; News. 10.30-12 :—London Regional. (Time Signal from Greenwich at 11.30).

NORTH NATIONAL (995kc.) (301.5m.).

12-1.55 :—National. 2-4.5 :—National. 5.15:—London National. 6-10.45 :—National.

SCOTTISH REGIONAL (797kc.) (376.4m.).

10.15 a.m. :—The Daily Service. 10.30-11.20 :—Time Signal from Greenwich; National. 12 :—North Regional. 12.30 :—The Scottish Studio Orchestra: Cruc Davidson (contralto). (Time Signal from Greenwich at 1.) 1.20 :—North Regional. 2 :—For the Schools—Reading Test. 2.5-2.25 :—National. 2.30 :—Music: Time and Tune—4: Mr. Herbert Wiseman; Modulator Practice. 3-3.20 :—Gramophone. 3.25 :—Mid-week Service, conducted by Rev. A. W. Scudamore Forbes. 3.50 :—National. 5.15 :—Children. 5.50 :—Birthdays. 6 :—Time Signal from Greenwich; Weather; News; Scottish Announcements; Scottish Market Prices for Farmers. 6.30 :—Mr. J. R. Richmond: Art in Glasgow. 6.45 :—The Scottish Studio Orchestra, directed by Guy Daines; Frank Brady (baritone). 7.45 :—The Perth Madrigal Choir, conducted by David T. Yacamini; Gladys White (pianoforte); Chester Henderson (violoncello). 9 :—Gramophone. 9.30 :—London Regional. 10.15 :—Time Signal from Greenwich; Weather; News. 10.30-12 :—London Regional. (Time Signal from Greenwich at 11.30.)

SCOTTISH NATIONAL (1,040kc.) (288.5m.).

12-1.55 :—National. 5.15 :—London National. 6-10.45 :—National.

WEST REGIONAL (968kc.) (309.9m.).

10.15 a.m. :—The Daily Service. 10.30-11.20 :—Time Signal from Greenwich; National. 12 :—North Regional. 12.30 :—Scottish Regional. (Time Signal from Greenwich at 1.) 1.20 :—North Regional. 2-3 :—Midland Regional. 3.5-3.25 :—Darlledu i'r Ysgolion yng Nghymru: Mr. Iorwerth C. Peate: Tro Trwy Gymru: Gwers—3: Dyffryn Clwyd—bywyd y dyffryn. 4.5 :—National. 5.15 :—Children. 6 :—Time Signal from Greenwich; Weather; News; Bulletin for Farmers; Regional Announcements; Market Prices for Farmers in the West. 6.30 :—London Regional. 8.15 :—Orig Hapus: Parti'r Lyrian. 8.45 :—Hubert Pengelly (pianoforte). 9 :—The Play Evolves, a dramatic survey by Ifan Kyrle-Fletcher of the theatre in the West Region; arranged for broadcasting and produced by Cyril Wood. 10.15 :—Time Signal from Greenwich; Weather; News. 10.30-12 :—London Regional. (Time Signal from Greenwich at 11.30.)

WEST NATIONAL (1,147kc.) (261.6m.).

12-1.55 :—National. 2-4.5 :—National. 5.15 :—London National. 6-10.45 :—National.

Figure 3.8 Broadcast schedule for 4 October 1933 (during the Mary Adams era), as printed in *The Times*, p. 4 (columns re-arranged). National service is shown on the left, and Regional services in the second and third columns. Third column also show regional variations in the National service: 'North National', 'Scottish National' and 'West National'

The series *What is Science?*, shown in the 'Changing World' programme (Figure 3.7), were the first broadcasts given by Hyman Levy, and on the strength of them he was invited to collaborate with Julian Huxley on the series *Scientific Research and Social Needs*,[78] transmitted in the autumn of 1933. One of Hyman Levy's scripts contained ideas about the social relations of science. Adams was apprehensive about it. She sent a note to William Bragg, who had been asked to supply an introductory talk for this series, asking him to put Levy's views 'in perspective' and added that 'Scientific progress seems ... to have magnified rather than minimised social instability.'[79] Her qualified and cautious view of science differentiates her from 'extensivists' such as Crowther for whom science, and scientific progress, in its methods and rationality, offered a model for social amelioration. Adams therefore used Bragg's introductory talk as a way of framing Levy's views by supplying a context which would make them less contentious.

In the following year, 1934, Levy broadcast a series of interviews with experts from various fields (including a manual worker), transmitted between April and June 1934 under the title *Web of Thought and Action*. These took a 'Marxist perspective on how people come to know the world.'[80]

The fortunes of Adult Education at the BBC took a turn for the worse in 1934, and thereafter a decline set in. From the late 1920s the BBC had been supporting adult education activities at local level around the country in the expectation that other adult-education organisations would eventually set up Area Councils to assume responsibility for local activities.[81] Few of these Councils came into existence, leaving the BBC to carry administrative and other costs for local activities[82]. This was a major factor in the curtailing of the BBC's adult-education activities.[83] This curtailment was especially notable after 1935, but was already evident in 1934. Figure 3.9 shows the plan of adult-education talks for April–July 1934.[84]

78 Wersky (1978), p.170.

79 Friday (1974), p.71.

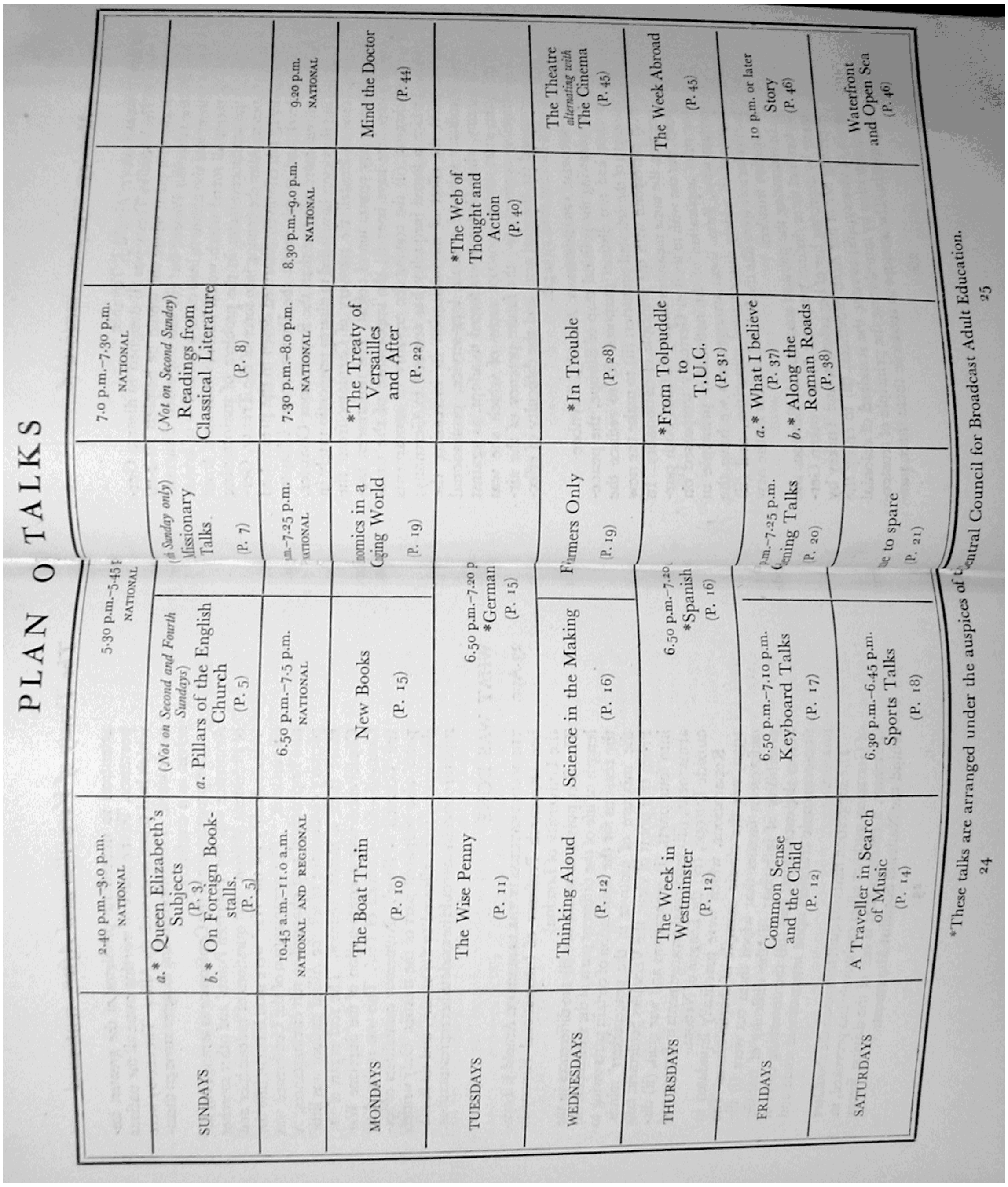
80 Wersky (1978), p.170. Wersky incorrectly implies that the series 'Web of thought and action' preceded the series 'Scientific research and social needs'. In fact 'Scientific research and social needs' came first.

81 Briggs (1995a) pp. 206–7.

82 Briggs (1995a) pp. 206–7.

83 Briggs (1995a) pp. 206–7.

84 BBC (1934), pp. 24 and 25.



PLAN OF TALKS

	2.40 p.m.–3.0 p.m. NATIONAL	5.30 p.m.–5.45 p.m. NATIONAL		7.0 p.m.–7.30 p.m. NATIONAL		
SUNDAYS	a.* Queen Elizabeth's Subjects (P. 3) b.* On Foreign Bookstalls. (P. 5)	(*Not on Second and Fourth Sundays*) a. Pillars of the English Church (P. 5)	([illegible] *Sunday only*) Missionary Talks (P. 7)	(*Not on Second Sunday*) Readings from Classical Literature (P. 8)		
	10.45 a.m.–11.0 a.m. NATIONAL AND REGIONAL	6.50 p.m.–7.5 p.m. NATIONAL	[illegible]m.–7.25 p.m. NATIONAL	7.30 p.m.–8.0 p.m. NATIONAL	8.30 p.m.–9.0 p.m. NATIONAL	9.20 p.m. NATIONAL
MONDAYS	The Boat Train (P. 10)	New Books (P. 15)	[illegible]nomics in a [illegible]ging World (P. 19)	*The Treaty of Versailles and After (P. 22)		Mind the Doctor (P. 44)
TUESDAYS	The Wise Penny (P. 11)	6.50 p.m.–7.20 p.m. *German (P. 15)			*The Web of Thought and Action (P. 40)	
WEDNESDAYS	Thinking Aloud (P. 12)	Science in the Making (P. 16)	Farmers Only (P. 19)	*In Trouble (P. 28)		The Theatre *alternating with* The Cinema (P. 45)
THURSDAYS	The Week in Westminster (P. 12)	6.50 p.m.–7.20 p.m. *Spanish (P. 16)		*From Tolpuddle to T.U.C. (P. 31)		The Week Abroad (P. 45)
FRIDAYS	Common Sense and the Child (P. 12)	6.50 p.m.–7.10 p.m. Keyboard Talks (P. 17)	[illegible]m.–7.25 p.m. [illegible]ning Talks (P. 20)	a.* What I believe (P. 37) b.* Along the Roman Roads (P. 38)		10 p.m. or later Story (P. 46)
SATURDAYS	A Traveller in Search of Music (P. 14)	6.30 p.m.–6.45 p.m. Sports Talks (P. 18)	[illegible]e to spare (P. 21)			Waterfront and Open Sea (P. 46)

*These talks are arranged under the auspices of [illegible]entral Council for Broadcast Adult Education.

24 25

Figure 3.9 Plan of talks for April–July 1934, from BBC (1934)

Here, in Figure 3.9, the number of slots is (depending on how the 'wide' slots are counted) around 30, giving a total of around 360 talks. This is a significant reduction from the 420 talks in Figure 3.4 from 1930. Sundays, which had no talks in 1930, by 1934 have some talks, but two of the slots are given over to religious talks, which reduces the slots available for other subjects.

Science appears to be less well represented in 1934 than in 1930, consisting only of *The Web of Thought and Action* (12 broadcasts) and *Science in the Making* (12 broadcasts), which amounted to about 6% of the talks (as opposed to 11.5% in 1930). But literature had declined too, consisting of just *Readings from Classical Literature* (12 broadcasts).

Counting broadcasts shows the difficulty of trying to infer changes in science-broadcasting policy from fluctuations in science output.[85] Fluctuations in science output mean very little without reference to fluctuations in total output, and without reference to changes in relative amounts of science and other subjects.

In 1936, at around the time she transferred to the new television service, Mary Adams set down her thoughts on the various ways of framing science broadcasts that she had overseen. Her observations have a downbeat tone. She considered that reflective talks by celebrated scientists, such as James Jeans or Arthur Eddington, who took a philosophical or semi-philosophical look at science, attracted listeners only because of the speakers' celebrity and achieved little in terms of scientific education:

> In the nature of things such talks have little educational value: but they have presentation & publicity value & are at any rate unharmful. We have had a good many such series in the past. Many of this kind frankly speaking are certainly not understood but the broadcasts have a spurious appeal.[86]

Adams says she hated this sort of talk.[87]

Talks that were scientific in a technical sense were, in Adams's view, 'practically impossible' for general listeners.[88] The same applied to specialised talks on, say,

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[85] Le Masurier (1997) does this, and associates the decline in science broadcasting with the more conservative regime in Talks from about 1935.

[86] WAC R51/523/1, undated memo from Mary Adams to Ian Cox, probably June 1936.

[87] WAC R51/523/1, undated memo from Mary Adams to Ian Cox, probably June 1936.

[88] WAC R51/523/1, undated memo from Mary Adams to Ian Cox, probably June 1936.

problems of evolution.[89] 'Factual' talks, which seems to have meant talks heavily based on observations of natural phenomena, were only viable if they could be attractively presented. [90]

Of the many types of science broadcast there had been, the most widely appreciated, according to Adams, were 'controversial' ones, that is, ones dealing with the social applications of science. The social application was usually the controversial part of the talk:

> The speaker competent to [discuss the relevance of scientific facts to social affairs] is generally a Marxist & therefore 'biased'.[91]

Adams says talks of this kind are in many ways 'the least satisfactory & difficult to arrange', the problem being that the 'biased' Marxist speakers were not always competent to speak on the facts.[92] This brings to mind the episode with Hyman Levy, and Adams's request to Bragg to frame Levy's views and thereby put them 'in perspective'.

What Adams liked best were, firstly, talks where factual content was presented attractively by virtue of a novel or entertaining style of presentation – for which the episode of the sparrow's tail in Crowther's broadcast looks like a plausible example. Secondly, she favoured talks which engaged the listener in making their own observations. Programmes of this sort, such as the *Science in the Making* series mentioned above, were only ever a small part of the BBC's general science output (as opposed to Schools Science). What Adams valued in this sort of broadcast was the exposition of the scientific method.

Several insights emerge from Adams's comments. First of all, and most obviously, framing mattered. The broadcast medium was not simply a neutral delivery channel for conveying scientists' thoughts to listeners. On the contrary, the medium, in the sense of the framing devices used, was integral to the process. Secondly, scientific broadcasting emerges as problematic. Every one of the several framing modes she enumerated was beset with difficulties, and she regarded general scientific broadcasting as virtually hopeless if the intention was to 'educate' the public in the findings of science – in effect to promote the public understanding of science (as that term is now conventionally understood). Thirdly, her concern with what the audience

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89 WAC R51/523/1, undated memo from Mary Adams to Ian Cox, probably June 1936.

90 WAC R51/523/1, undated memo from Mary Adams to Ian Cox, probably June 1936.

91 WAC R51/523/1, undated memo from Mary Adams to Ian Cox, probably June 1936.

92 WAC R51/523/1, undated memo from Mary Adams to Ian Cox, probably June 1936.

could and could not understand, with finding attractive and novel styles of presentation, and with the problems of finding good speakers, showed a broadcaster's concern with the best way to deploy her resources, and an awareness of her own role as gatekeeper. For Adams, the first priority was to be entertaining. This was in marked contrast with the science populariser Crowther who saw the role of the speaker as not to entertain but to instruct, and who disparaged the use of 'entertainment'. Fourthly, Adams was not especially sympathetic to the 'social relations' approach of underscoring the relationship of science and society, despite herself being a eugenicist who had broadcast on the potential of science to improve the genetic stock of society.

In summary, Adams worked creatively with the several resources at her disposal, principally scientists and framing techniques, to find ways of engaging listeners' attention and, in the process, informing them about science. As with Matheson and Reith, part of her role was to act as a gatekeeper. She also shaped her contributors' work by through framing devices – for instance, changing the context in which it was heard, as with Bragg's introductory talk designed to make Levy's talk more acceptable. Unlike Crowther, she did not see her role as the promotion of 'science' as an abstract cause; rather, her focus was on the listener, and science was the context in which she operated.

Adams left the Talks Department in 1936 to join the new television service, where she remained until her retirement, producing children's programmes, arts and sciences programmes, and eventually becoming Head of Talks for television. Her departure from Radio Talks in 1936 was part of the general exodus that accompanied what Scannell refers to as 'the wholesale dismantling of the [Talks] department.'[93] Charles Siepmann, the departing Head of Talks, went, in 1937, to study educational broadcasting in America under the auspices of the Rockefeller foundation, and during the first few years of the Second World War was both a lecturer at Harvard and a Presidential adviser on radio developments. Remaining in the USA after the war, he was involved with a number of official bodies associated with broadcasting and education.[94]

The new Head of Talks (following a short interregnum with a temporary Head) was Sir Richard Maconachie, who was brought into the BBC to fill the post from a ministerial position in overseas administration. Cardiff and Scannell see his appointment as signalling 'a marked retreat from dealing with contentious issues in

93 Scannell (1980), p. 26

94 Meyer (1964).

talks programmes'.[95] Talks dealing with the major political and social themes of the time became notable for their absence.[96] The decline of the BBC's involvement in adult education is another element in the decline of the Talks department.

A third strand in the decline of Talks is emblematically represented in a complaint by Member of Parliament Sir Alfred Knox to the Postmaster General. He lamented the BBC's neglect of 'the wants of the ordinary man, who, after a hard day's work, wants some amusement and not instruction.'[97] The widespread public preference for amusement over instruction was demonstrated from the mid-1930s as the BBC began to face significant commercial competition for the first time. This came from foreign stations directing commercially sponsored English-language transmissions of popular material at the UK (primarily Radio Luxembourg). The popularity of these broadcasts demonstrated that there was an unsatisfied demand for this kind of material. In response, the BBC increased significantly its expenditure on popular entertainment in the second half of the 1930s, and the format of radio talks became lighter.[98]

3.3 Ian Cox, 1936–40

Mary Adams's successor was Ian Cox, by training a geologist.[99] Like Mary Adams, he set down his thoughts on the framing of science broadcasting, although, unlike Adams, Cox did it twice, with a gap of roughly ten years between. The marked difference in philosophy between Adams and Cox gives yet another indication of producer autonomy. These two producers appear to have had a considerable power to determine the style of science broadcasting that the BBC produced, rather than being required to implement a policy decided at higher managerial level.

Cox's first exposition of his thoughts comes from the mid-1930s, when he was a new recruit, with relatively little experience as a broadcaster. Whereas Adams classified science talks by type of speaker and the objective of the talk, Cox based his classification on a socio-historical view of science. The influence of Cox's geological training is evident in his classification, which generalises from nineteenth-century geology and palaeontology. In essence, Cox divided science into 'amateur' and 'professional' (although he did not use those terms). For Cox, science unfolded

95 Cardiff and Scannell (1991), p. 69.

96 Cardiff and Scannell (1982), p. 174.

97 Knox (1935).

98 Cardiff (1983); Cardiff (1980), p. 34.

99 WAC General Advisory Council papers, Special Subcommittee to Consider Broadcasts on Science, 4 July 1949.

though three stages. First came the amassing of facts or observations. This was amateur or 'popular' science, in the sense that it was performed by the people rather than by specialists. An example was the early days of fossil collection, when anyone could participate. Cox considered that this stage of scientific development held possibilities for science talks.[100]

The next stage, according to Cox, was when a field became the province of experts who engaged in 'intensive systematic work and the working out of innumerable details, so that a fairly complete picture of that field emerges'.[101] This kind of work was usually the province of the professional scientist, and because it was esoteric held little interest for the public.[102] Nevertheless, Cox considered that, of the three stages he had identified, this was the most fruitful for science talks. Talks related to this stage would have the merit of revealing what the day-to-day life of a professional scientist was like:

> ... how much time the scientist is bound to waste trying all possibilities, although probably he is convinced that 99% will prove no good. The value of negative results, a thing never appreciated by the public, ...[103]

Cox's third stage was when a scientific field was more or less worked out. Here findings and conclusions were fairly uncontroversial. The field came back into the non-specialist domain as people exploited scientific findings practically, but without knowing or caring how they had been derived. One of the dangers of this stage for broadcasters was that:

> it awakens the longing (latent in most people) for the 'Universal Panacea'[104]

Cox thus saw a danger during the third stage that society would put too much faith in science as a remedy for its ills. Furthermore:

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100 WAC R51/523/1, memo Cox to Director of Talks (Rose Troup), 25 June 1936. Johnson (2007, pp.246) observes that in the nineteenth century, the accumulation of facts 'unfettered by speculative attempts at explanation' was regarded by many scientists as good practice. Only later was this approach disparaged as mere 'stamp collecting'.

101 WAC R51/523/1, memo Cox to Director of Talks (Rose Troup), 25 June 1936.

102 WAC R51/523/1, memo Cox to Director of Talks (Rose Troup), 25 June 1936.

103 WAC R51/523/1, memo Cox to Director of Talks (Rose Troup), 25 June 1936.

104 WAC R51/523/1, memo Cox to Director of Talks (Rose Troup), 25 June 1936.

> The talks from this group would concern themselves with the applications of scientific results to the layman's life and philosophy. I am very frightened of this.[105]

What alarmed Cox was the overlooking of qualifications and provisos that need to be applied to scientific findings if they were to be properly appreciated.[106] This third stage was the one Cox saw as least fertile for science talks.

Thus, at this early stage of his career, Cox was more disposed towards talks that either concentrated on science as an activity people could engage with almost at a hobby level, or ones that showed what scientists actually did from day to day. He was inclined to be suspicious of 'science and society' talks, which had been a feature of Adams's tenure. An early series he produced, *Scientists at Work*, broadcast in autumn 1936, featured scientists from a range of disciplines.[107] It related to the second stage of his three-stage development of science.

In 1937 the Talks Advisory Committee was established, replacing the now defunct Adult Education Advisory Committee. Membership of the new committee was by invitation from the BBC.[108] Among its members was the biologist Julian Huxley. He became an unofficial science advisor, and indeed in May 1937 the Director of Talks urged Ian Cox to consult Huxley for help and advice on a series that eventually became *What More Do You Want from the Scientist?* (concerning what was and was not scientifically feasible) broadcast in the autumn of 1937.[109] Huxley was effectively a border figure, like Heard, being not quite an insider and not quite and outsider in relation to the BBC.[110]

Although under Ian Cox science programmes were no longer produced as part of a formal adult education stream, the 'adult education' type of programme developed in the Matheson and Adams eras continued. It was a style in which scientists addressed listeners directly, rather than via an interviewer, on topics not tied directly to contemporary issues or research developments. This was demonstrated by series such as *What More Do You Want from the Scientist?* (referred to above), *The Story*

105 WAC R51/523/1, memo Cox to Director of Talks (Rose Troup), 25 June 1936.

106 WAC R51/523/1, memo Cox to Director of Talks (Rose Troup), 25 June 1936.

107 *Scientists at Work* comprised twelve broadcasts, from 6 October 1936 to 22 December 1936, and featured among its speakers zoologist D. M. S. Watson, embryologist C. H. Waddington, physicist P. M. S. Blackett, archaeologist Louis S. B. Leakey and physiologist A. V. Hill. WAC R51/523/1, memo 26 August 1936 to Regional Directors.

108 WAC R203/1, letter from C. G. Graves to Sir Walter Moberly, 24 December 1936.

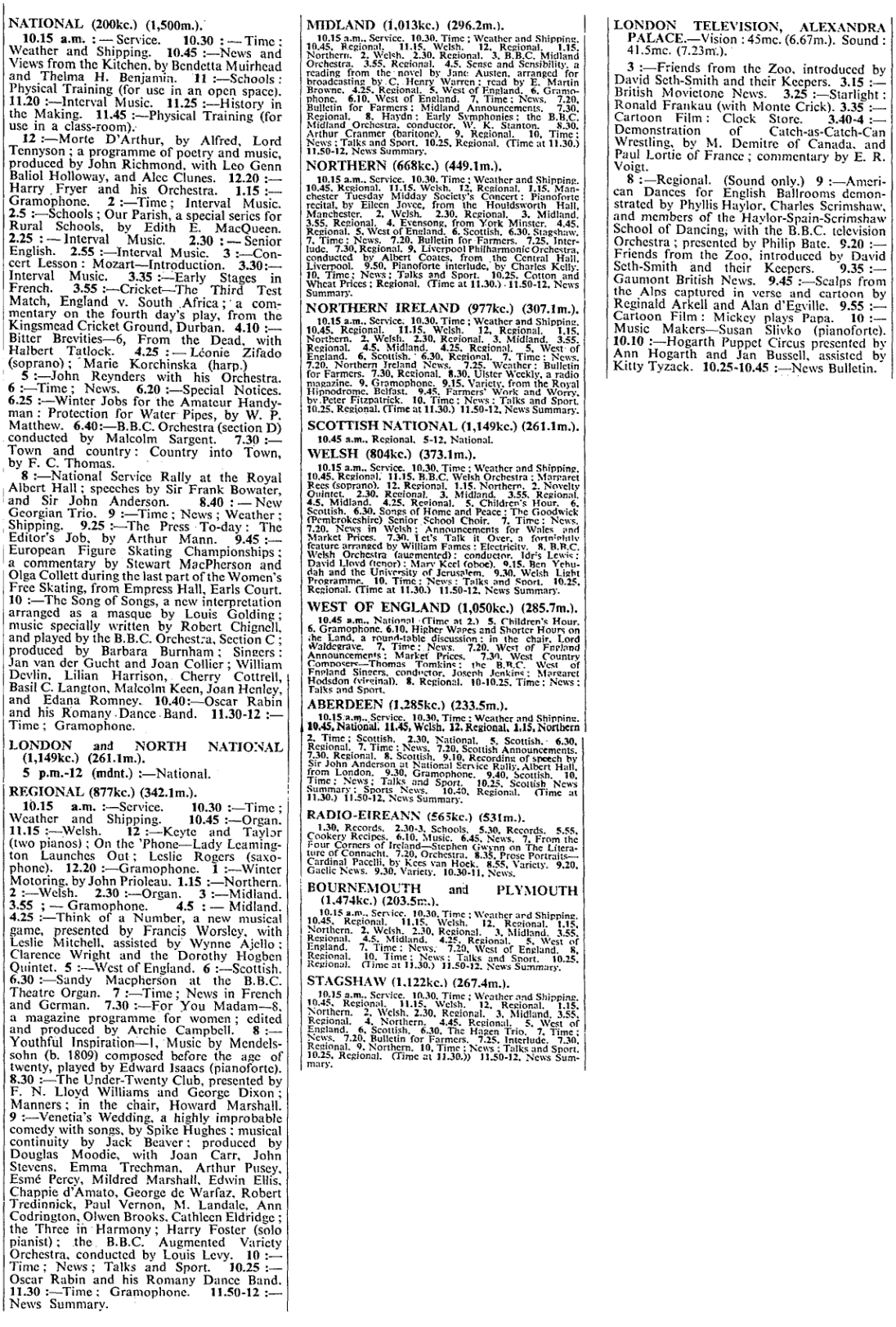
109 WAC R51/523/2, memo from Director of Talks to NRD for the attention of Mr Cox, 10 May 1937.

110 WAC R51/523/2, memo from Director of Talks to NRD for the attention of Mr Cox, 10 May 1937.

of the Rocks (on geology) in the autumn of 1938, as well as individual programmes such as Ambrose Fleming's reflecting, in spring 1938, on *The Early Days of Wireless*, or a pair of programmes in the summer of 1938 on *Science and Gardening*.[111]

However, besides maintaining the 'adult education' style, Cox also sought a more topical treatment of science. In the spring of 1939, he produced a series of six broadcasts on *Modern Inventions* which included television, the cyclotron, and recent improvements in internal combustion engines. More significantly, in 1939 he revived regular, topical science programming, which had languished since the cessation of Gerald Heard's *This Surprising World* series in 1934. Cox's *Science Review* ran fortnightly from 9 January 1939 to 17 March 1939 on the London Regional service. It consisted of a number of short scientific talks, about 8 minutes in length, of current interest. The aim of the programme was to provide first-hand information about scientific developments, and was designed to interest a wide audience with no scientific training.

[111] *What More Do You Want from the Scientist?* was broadcast weekly from 15 October to 12 November 1937. *The Story of the Rocks* was broadcast weekly from 10 October 1938 to 2 January 1939. Fleming's *The Early Days of Wireless* was broadcast on 18 May 1938. B. A. Keen's *Science and Gardening* were broadcast on 20 and 27 June 1938.



NATIONAL (200kc.) (1,500m.).

10.15 a.m. :—Service. **10.30** :—Time; Weather and Shipping. **10.45** :—News and Views from the Kitchen, by Bendetta Muirhead and Thelma H. Benjamin. **11** :—Schools: Physical Training (for use in an open space). **11.20** :—Interval Music. **11.25** :—History in the Making. **11.45** :—Physical Training (for use in a class-room).

12 :—Morte D'Arthur, by Alfred, Lord Tennyson; a programme of poetry and music, produced by John Richmond, with Leo Genn Baliol Holloway, and Alec Clunes. **12.20** :—Harry Fryer and his Orchestra. **1.15** :—Gramophone. **2** :—Time; Interval Music. **2.5** :—Schools; Our Parish, a special series for Rural Schools, by Edith E. MacQueen. **2.25** :—Interval Music. **2.30** :—Senior English. **2.55** :—Interval Music. **3** :—Concert Lesson: Mozart—Introduction. **3.30**:—Interval Music. **3.35** :—Early Stages in French. **3.55** :—Cricket—The Third Test Match, England v. South Africa; a commentary on the fourth day's play, from the Kingsmead Cricket Ground, Durban. **4.10** :—Bitter Brevities—6, From the Dead, with Halbert Tatlock. **4.25** :—Léonie Zifado (soprano); Marie Korchinska (harp.)

5 :—John Reynders with his Orchestra. **6** :—Time; News. **6.20** :—Special Notices. **6.25** :—Winter Jobs for the Amateur Handyman: Protection for Water Pipes, by W. P. Matthew. **6.40**:—B.B.C. Orchestra (section D) conducted by Malcolm Sargent. **7.30** :—Town and country: Country into Town, by F. C. Thomas.

8 :—National Service Rally at the Royal Albert Hall; speeches by Sir Frank Bowater, and Sir John Anderson. **8.40** :—New Georgian Trio. **9** :—Time; News; Weather; Shipping. **9.25** :—The Press To-day: The Editor's Job, by Arthur Mann. **9.45** :—European Figure Skating Championships; a commentary by Stewart MacPherson and Olga Collett during the last part of the Women's Free Skating, from Empress Hall, Earls Court. **10** :—The Song of Songs, a new interpretation arranged as a masque by Louis Golding; music specially written by Robert Chignell, and played by the B.B.C. Orchestra, Section C; produced by Barbara Burnham; Singers: Jan van der Gucht and Joan Collier; William Devlin, Lilian Harrison, Cherry Cottrell, Basil C. Langton, Malcolm Keen, Joan Henley, and Edana Romney. **10.40**:—Oscar Rabin and his Romany Dance Band. **11.30-12** :—Time; Gramophone.

LONDON and NORTH NATIONAL (1,149kc.) (261.1m.).

5 p.m.-12 (mdnt.) :—National.

REGIONAL (877kc.) (342.1m.).

10.15 a.m. :—Service. **10.30** :—Time; Weather and Shipping. **10.45** :—Organ. **11.15** :—Welsh. **12** :—Keyte and Taylor (two pianos); On the 'Phone—Lady Leamington Launches Out; Leslie Rogers (saxophone). **12.20** :—Gramophone. **1** :—Winter Motoring, by John Prioleau. **1.15** :—Northern. **2** :—Welsh. **2.30** :—Organ. **3** :—Midland. **3.55** ; — Gramophone. **4.5** : — Midland. **4.25** :—Think of a Number, a new musical game, presented by Francis Worsley, with Leslie Mitchell, assisted by Wynne Ajello; Clarence Wright and the Dorothy Hogben Quintet. **5** :—West of England. **6** :—Scottish. **6.30** :—Sandy Macpherson at the B.B.C. Theatre Organ. **7** :—Time; News in French and German. **7.30** :—For You Madam—8, a magazine programme for women; edited and produced by Archie Campbell. **8** :—Youthful Inspiration—1, Music by Mendelssohn (b. 1809) composed before the age of twenty, played by Edward Isaacs (pianoforte). **8.30** :—The Under-Twenty Club, presented by F. N. Lloyd Williams and George Dixon; Manners; in the chair, Howard Marshall. **9** :—Venetia's Wedding, a highly improbable comedy with songs, by Spike Hughes; musical continuity by Jack Beaver; produced by Douglas Moodie, with Joan Carr, John Stevens, Emma Trechman, Arthur Pusey, Esmé Percy, Mildred Marshall, Edwin Ellis, Chappie d'Amato, George de Warfaz, Robert Tredinnick, Paul Vernon, M. Landale, Ann Codrington, Olwen Brooks, Cathleen Eldridge; the Three in Harmony; Harry Foster (solo pianist); the B.B.C. Augmented Variety Orchestra, conducted by Louis Levy. **10** :—Time; News; Talks and Sport. **10.25** :—Oscar Rabin and his Romany Dance Band. **11.30** :—Time; Gramophone. **11.50-12** :—News Summary.

MIDLAND (1,013kc.) (296.2m.).

10.15 a.m., Service. 10.30, Time; Weather and Shipping. 10.45, Regional. 11.15, Welsh. 12, Regional. 1.15, Northern. 2, Welsh. 2.30, Regional. 3, B.B.C. Midland Orchestra. 3.55, Regional. 4.5, Sense and Sensibility, a reading from the novel by Jane Austen, arranged for broadcasting by C. Henry Warren; read by E. Martin Browne. 4.25, Regional. 5, West of England. 6, Gramophone. 6.10, West of England. 7, Time; News. 7.20, Bulletin for Farmers; Midland Announcements. 7.30, Regional. 8, Haydn: Early Symphonies; the B.B.C. Midland Orchestra, conductor, W. K. Stanton. 8.30, Arthur Cranmer (baritone). 9, Regional. 10, Time; News; Talks and Sport. 10.25, Regional. (Time at 11.30.) 11.50-12, News Summary.

NORTHERN (668kc.) (449.1m.).

10.15 a.m., Service. 10.30, Time; Weather and Shipping. 10.45, Regional. 11.15, Welsh. 12, Regional. 1.15, Manchester Tuesday Midday Society's Concert: Pianoforte recital, by Eileen Joyce, from the Houldsworth Hall, Manchester. 2, Welsh. 2.30, Regional. 3, Midland. 3.55, Regional. 4, Evensong, from York Minster. 4.45, Regional. 5, West of England. 6, Scottish. 6.30, Stagshaw. 7, Time; News. 7.20, Bulletin for Farmers. 7.25, Interlude. 7.30, Regional. 9, Liverpool Philharmonic Orchestra, conducted by Albert Coates, from the Central Hall, Liverpool. 9.50, Pianoforte interlude, by Charles Kelly. 10, Time; News; Talks and Sport. 10.25, Cotton and Wheat Prices; Regional. (Time at 11.30.) 11.50-12, News Summary.

NORTHERN IRELAND (977kc.) (307.1m.).

10.15 a.m., Service. 10.30, Time; Weather and Shipping. 10.45, Regional. 11.15, Welsh. 12, Regional. 1.15, Northern. 2, Welsh. 2.30, Regional. 3, Midland. 3.55, Regional. 4.5, Midland. 4.25, Regional. 5, West of England. 6, Scottish. 6.30, Regional. 7, Time; News. 7.20, Northern Ireland News. 7.25, Weather: Bulletin for Farmers. 7.30, Regional. 8.30, Ulster Weekly, a radio magazine. 9, Gramophone. 9.15, Variety, from the Royal Hippodrome, Belfast. 9.45, Farmers' Work and Worry, by Peter Fitzpatrick. 10, Time; News; Talks and Sport. 10.25, Regional. (Time at 11.30.) 11.50-12, News Summary.

SCOTTISH NATIONAL (1,149kc.) (261.1m.).

10.45 a.m., Regional. 5-12, National.

WELSH (804kc.) (373.1m.).

10.15 a.m., Service. 10.30, Time; Weather and Shipping. 10.45, Regional. 11.15, B.B.C. Welsh Orchestra; Margaret Rees (soprano). 12, Regional. 1.15, Northern. 2, Novelty Quintet. 2.30, Regional. 3, Midland. 3.55, Regional. 4.5, Midland. 4.25, Regional. 5, Children's Hour. 6, Scottish. 6.30, Songs of Home and Peace: The Goodwick (Pembrokeshire) Senior School Choir. 7, Time; News. 7.20, News in Welsh; Announcements for Wales and Market Prices. 7.30, Let's Talk it Over, a fortnightly feature arranged by William Fames: Electricity. 8, B.B.C. Welsh Orchestra (augmented); conductor, Ida's Lewis; David Lloyd (tenor); Mary Keel (oboe). 9.15, Ben Jehudah and the University of Jerusalem. 9.30, Welsh Light Programme. 10, Time; News; Talks and Sport. 10.25, Regional. (Time at 11.30.) 11.50-12, News Summary.

WEST OF ENGLAND (1,050kc.) (285.7m.).

10.45 a.m., National. (Time at 2.) 5, Children's Hour. 6, Gramophone. 6.10, Higher Wages and Shorter Hours on the Land, a round-table discussion; in the chair, Lord Waldegrave. 7, Time; News. 7.20, West of England Announcements; Market Prices. 7.30, West Country Composers—Thomas Tomkins; the B.B.C. West of England Singers, conductor, Joseph Jenkins; Margaret Hodsdon (virginal). 8, Regional. 10-10.25, Time; News; Talks and Sport.

ABERDEEN (1,285kc.) (233.5m.).

10.15 a.m., Service. 10.30, Time; Weather and Shipping. 10.45, National. 11.45, Welsh. 12, Regional. 1.15, Northern 2, Time; Scottish. 2.30, National. 5, Scottish. 6.30, Regional. 7, Time; News. 7.20, Scottish Announcements. 7.30, Regional. 8, Scottish. 9.10, Recording of speech by Sir John Anderson at National Service Rally, Albert Hall, from London. 9.30, Gramophone. 9.40, Scottish. 10, Time; News; Talks and Sport. 10.25, Scottish News Summary; Sports News. 10.40, Regional. (Time at 11.30.) 11.50-12, News Summary.

RADIO-EIREANN (565kc.) (531m.).

1.30, Records. 2.30-3, Schools. 5.30, Records. 5.55, Cookery Recipes. 6.10, Music. 6.45, News. 7, From the Four Corners of Ireland—Stephen Gwynn on The Literature of Connacht. 7.20, Orchestra. 8.35, Prose Portraits—Cardinal Pacelli, by Kees van Hoek. 8.55, Variety. 9.20, Gaelic News. 9.30, Variety. 10.30-11, News.

BOURNEMOUTH and PLYMOUTH (1,474kc.) (203.5m.).

10.15 a.m., Service. 10.30, Time; Weather and Shipping. 10.45, Regional. 11.15, Welsh. 12, Regional. 1.15, Northern. 2, Welsh. 2.30, Regional. 3, Midland. 3.55, Regional. 4.5, Midland. 4.25, Regional. 5, West of England. 7, Time; News. 7.20, West of England. 8, Regional. 10, Time; News; Talks and Sport. 10.25, Regional. (Time at 11.30.) 11.50-12, News Summary.

STAGSHAW (1,122kc.) (267.4m.).

10.15 a.m., Service. 10.30, Time; Weather and Shipping. 10.45, Regional. 11.15, Welsh. 12, Regional. 1.15, Northern. 2, Welsh. 2.30, Regional. 3, Midland. 3.55, Regional. 4, Northern. 4.45, Regional. 5, West of England. 6, Scottish. 6.30, The Hagen Trio. 7, Time; News. 7.20, Bulletin for Farmers. 7.25, Interlude. 7.30, Regional. 9, Northern. 10, Time; News; Talks and Sport. 10.25, Regional. (Time at 11.30.)) 11.50-12, News Summary.

LONDON TELEVISION, ALEXANDRA PALACE.—Vision: 45mc. (6.67m.). Sound: 41.5mc. (7.23m.).

3 :—Friends from the Zoo, introduced by David Seth-Smith and their Keepers. **3.15** :—British Movietone News. **3.25** :—Starlight: Ronald Frankau (with Monte Crick). **3.35** :—Cartoon Film: Clock Store. **3.40-4** :—Demonstration of Catch-as-Catch-Can Wrestling, by M. Demitre of Canada, and Paul Lortie of France; commentary by E. R. Voigt.

8 :—Regional. (Sound only.) **9** :—American Dances for English Ballrooms demonstrated by Phyllis Haylor, Charles Scrimshaw, and members of the Haylor-Spain-Scrimshaw School of Dancing, with the B.B.C. television Orchestra; presented by Philip Bate. **9.20** :—Friends from the Zoo, introduced by David Seth-Smith and their Keepers. **9.35** :—Gaumont British News. **9.45** :—Scalps from the Alps captured in verse and cartoon by Reginald Arkell and Alan d'Egville. **9.55** :—Cartoon Film: Mickey plays Papa. **10** :—Music Makers—Susan Slivko (pianoforte). **10.10** :—Hogarth Puppet Circus presented by Ann Hogarth and Jan Bussell, assisted by Kitty Tyzack. **10.25-10.45** :—News Bulletin.

Figure 3.10 Broadcast schedule for 24 January 1939, as printed in *The Times*, p. 22 (columns rearranged and foreign stations removed, except Radio-Eirann). Television broadcasts are shown in the right-hand column

In 1938, the British Association founded a new Division for Social and International Relations of Science. Among the functions of the Division, which included such activities as arranging meetings and promoting research and publications, was the following:

> (c) To be prepared to act in a consultative capacity and to supply information to organisations, individuals and the public.[112]

Its first public meeting was in Reading on 28 March 1939, on the subject of nutrition. Peter Ritchie Calder wrote to a BBC Talks manager to suggest the meeting might be a suitable pretext for a slot in *The World Goes By*, a general-interest magazine-style programme, with short items on topics of all kinds. The feature, Calder suggested, could explain the purpose of the new division:

> ...bringing science into closer contact with the man-in-the-street, making it a new practical force in the world and social affairs, tackling the problems which science has helped to create and can help to solve.[113]

The idea hinted at here, that science was potentially threatening but could also offer deliverance from social problems, was a tenet of the social relations of science movement, as outlined in Chapter 1. Calder, however, saw a reciprocal obligation on the public:

> As we were saying at Broadcasting House the other night a revolution has taken place in the attitude of the scientist. What is needed now is a new attitude towards science amongst the ordinary folks who are either suspicious or distrustful of science.[114]

As was shown earlier, science producer Ian Cox thought scientific broadcasting might have a better chance of success if it approached science as an activity open to all, with no clear division between them. Also as shown earlier, Cox was apprehensive about treating science as a 'universal panacea', and 'very frightened' of applying science to the ordinary person's life and philosophy. Calder's proposal, therefore, ran counter to Cox's preferred ways of handling science broadcasts on several points. It is not clear whether this played any part in the rejection of the proposal a few days after it was made.[115]

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112 British Association for the Advancement of Science (1939), p. 133.

113 WAC Calder Contributor File, Calder to Pringle, 17 March 1939.

114 WAC Calder Contributor File, Calder to Pringle, 17 March 1939.

115 WAC Calder Contributor File, Pringle to Calder, 27 March 1939.

Following the end of the first series of the science series *Science Review* in March 1939, Cox distributed a circular to professional and learned bodies drawing their attention to the series and asking them if they had suitable material or speakers for a new series.[116] Among the numerous responses, most little more than an acknowledgement, was one from the British Association for the Advancement of Science. Mentioning its new Division for Social and International Relations of Science, the Association considered that cooperation with the BBC, if formally established, would be within the remit of the new Division:

> As for suggestions as to material and speakers, if there were any question of putting this on a formal basis of co-operation it could certainly be considered as a possible function of the executive of our new Division for the Social and International Relations of Science.[117]

As it happens, some members of the Division's committee already had well established connections with the BBC. Julian Huxley was a frequent broadcaster and a member of the Talks Advisory Committee. P. M. S. Blackett and Hyman Levy, both committee members, had broadcast several times.

The second season of *Science Review* did not, however, proceed. It was a casualty of the declaration of war later in 1939, and formal co-operation with the Division for the Social and International Relations of Science was not pursued. Following the declaration of war, Cox left the BBC for naval service.

3.4 Science broadcasting in the USA; a contrasting example

To close this chapter, I want to look briefly at an approach to science broadcasting that contrasts strongly with the British approach that developed in the 1920s and 30s. This is the American approach. Particular points of contrast relate to the role of staff within the broadcasting organisation, and the place of external scientific bodies in producing scientific broadcasts. I have shown that in the BBC 'public service' system, BBC producers created a role for themselves as broadcasting professionals. They were highly interventionist, acting as gatekeepers and framers, and regarding control of access to the medium as their prerogative. This was in marked contrast the American model, as I now show.

In the early years of broadcasting in the USA, in the 1920s, there was a strong public service ethos. The federal government regarded the radio spectrum as a public

[116] WAC R51/523/2, draft circular from Ian Cox, undated but probably April 1939.

[117] WAC R51/523/2, letter 3 May 1939.

resource, and required broadcasters to serve a public interest in order to retain a licence. Several early broadcasting associations were based in museums and universities, and their educational mission set the style for early public service broadcasting. In contrast to the British-based model of public service broadcasting, with its emphasis on cultural enrichment within a hierarchy of cultural values, the American system drew on local traditions of adult education, agricultural extension and university-based community service.[118] Where universities owned radio stations, it was not unusual for their science departments to produce science broadcasts.[119] This arrangement had similarities with the model of scientific control of science broadcasting advocated by Crowther in his 1926 letter to Matheson.

Many of these early educational broadcasters in the USA struggled to survive in the late 1920s and early 1930s as the Federal Radio Commission, an independent regulator, allowed broadcasters to compete for spectrum by presenting a case to the Commission. The decisions taken by the Commission favoured large, commercial 'general interest' broadcasters over special-interest broadcasters. In this environment, a few large commercial broadcasters, such as CBS and NBC, came to dominate the American broadcasting landscape.[120] These were initially networks of affiliated stations. Later they became 'vertically integrated and nationally centralized systems of program production and distribution.'[121]

With this structural change in the way stations were organised came an increasing shift towards funding through advertising, and the dominance of commercial goals in programming decisions.[122] Science programming, along with other forms educational and public-service output, migrated to parts of the schedule which advertisers were not interested in buying, such as late-night slots. As far as broadcasters were concerned, this was 'low-cost' or 'no-cost' broadcasting.[123]

Among the occasional producers of science broadcasts in the late 1930s was the American Association for the Advancement of Science.[124] Two institutions in particular, however, became dominant producers of widely syndicated science

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118 Slotten (2006), p. 254.

119 LaFollette (2008), p. 17.

120 Streeter (1996), pp. 98–9.

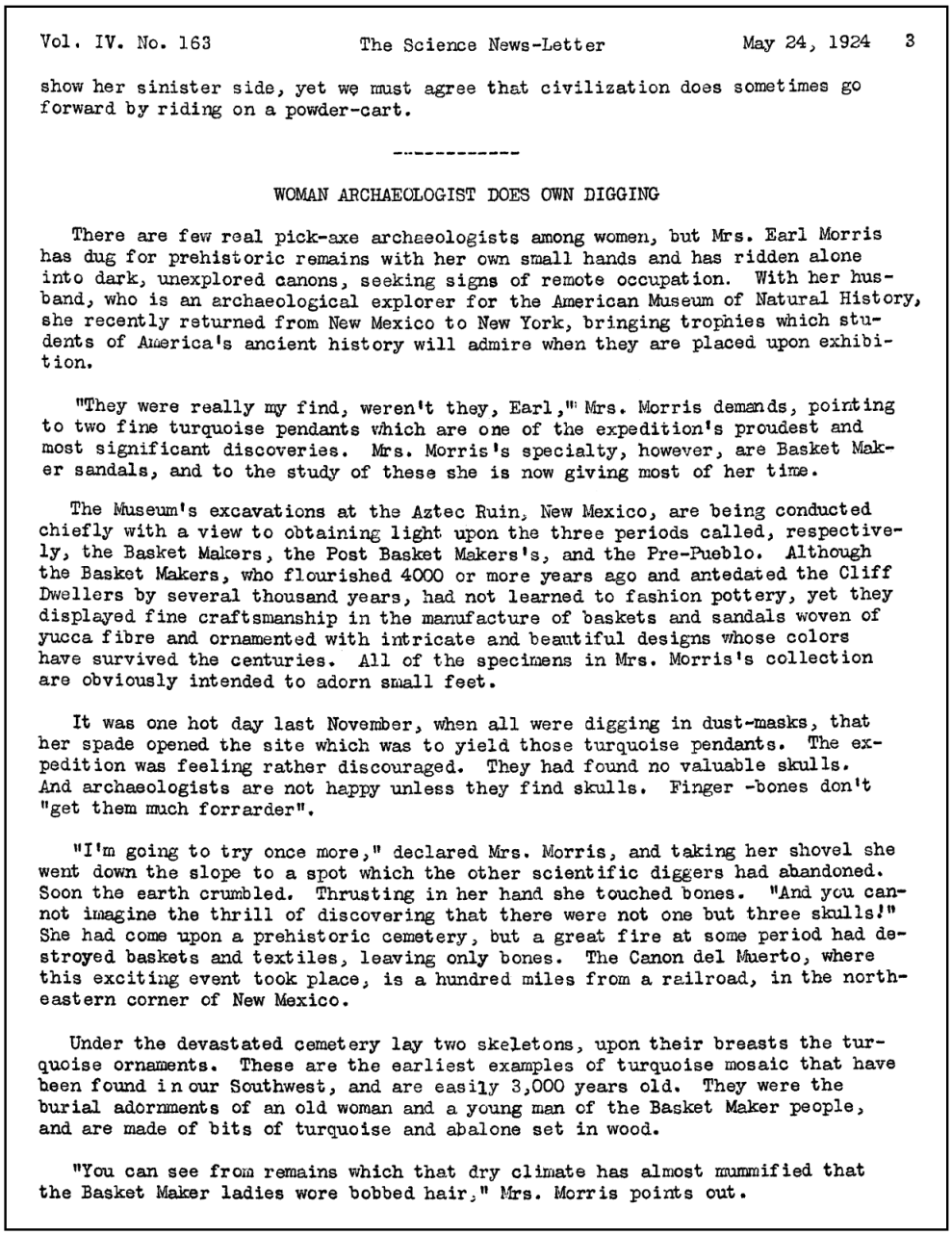
121 Streeter (1996), pp. 98–9.

122 LaFollette (2002a), p. 7.

123 LaFollette (2002a), p. 7.

124 LaFollette (2002a), p.18.

broadcasts: the Smithsonian Institution and Science Service.[125] Science Service was an agency for science news founded in 1921 by the newspaper publisher Edward Scripps. It published a regular newsletter. Figure 3.11 shows an example.



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show her sinister side, yet we must agree that civilization does sometimes go forward by riding on a powder-cart.

WOMAN ARCHAEOLOGIST DOES OWN DIGGING

There are few real pick-axe archaeologists among women, but Mrs. Earl Morris has dug for prehistoric remains with her own small hands and has ridden alone into dark, unexplored canons, seeking signs of remote occupation. With her husband, who is an archaeological explorer for the American Museum of Natural History, she recently returned from New Mexico to New York, bringing trophies which students of America's ancient history will admire when they are placed upon exhibition.

"They were really my find, weren't they, Earl," Mrs. Morris demands, pointing to two fine turquoise pendants which are one of the expedition's proudest and most significant discoveries. Mrs. Morris's specialty, however, are Basket Maker sandals, and to the study of these she is now giving most of her time.

The Museum's excavations at the Aztec Ruin, New Mexico, are being conducted chiefly with a view to obtaining light upon the three periods called, respectively, the Basket Makers, the Post Basket Makers's, and the Pre-Pueblo. Although the Basket Makers, who flourished 4000 or more years ago and antedated the Cliff Dwellers by several thousand years, had not learned to fashion pottery, yet they displayed fine craftsmanship in the manufacture of baskets and sandals woven of yucca fibre and ornamented with intricate and beautiful designs whose colors have survived the centuries. All of the specimens in Mrs. Morris's collection are obviously intended to adorn small feet.

It was one hot day last November, when all were digging in dust-masks, that her spade opened the site which was to yield those turquoise pendants. The expedition was feeling rather discouraged. They had found no valuable skulls. And archaeologists are not happy unless they find skulls. Finger -bones don't "get them much forrarder".

"I'm going to try once more," declared Mrs. Morris, and taking her shovel she went down the slope to a spot which the other scientific diggers had abandoned. Soon the earth crumbled. Thrusting in her hand she touched bones. "And you cannot imagine the thrill of discovering that there were not one but three skulls!" She had come upon a prehistoric cemetery, but a great fire at some period had destroyed baskets and textiles, leaving only bones. The Canon del Muerto, where this exciting event took place, is a hundred miles from a railroad, in the northeastern corner of New Mexico.

Under the devastated cemetery lay two skeletons, upon their breasts the turquoise ornaments. These are the earliest examples of turquoise mosaic that have been found in our Southwest, and are easily 3,000 years old. They were the burial adornments of an old woman and a young man of the Basket Maker people, and are made of bits of turquoise and abalone set in wood.

"You can see from remains which that dry climate has almost mummified that the Basket Maker ladies wore bobbed hair," Mrs. Morris points out.

Figure 3.11 Page from Science Service *Science News-Letter*, 24 May 1924

Both the Smithsonian and Science Survey began producing broadcasts in the 1920s, and by the 1930s they came to have leading roles in science broadcasting. These organisations, however, did more than simply produce science broadcasts. Individuals working for them scouted for and discovered new speakers for broadcasts, edited their scripts, and coached them in microphone delivery.[126] In

[125] LaFollette (2002a), p. 17–18.

[126] LaFollette (2008), pp. 18–20 and 39.

several respects they were equivalent to producers at the BBC, performing a similar gatekeeping function. The broadcasting organisations that carried the programmes played little part in shaping the content of the broadcasts.

Science broadcasting in the USA became increasingly marginalised, though, from the 1940s onwards. The broadcasting companies increasingly pursued only commercial interests, and scientists did little resist the neglect of science on the air.[127] As science broadcasting declined, and as science production had been largely outsourced, there was no one inside broadcasting organisations to act as an advocate for science within the broadcasting organisations. [128]

Summary of Chapter 3

This chapter has shown that science broadcasting was a significant part of the BBC's Talks output, initially associated, as most talks were until the mid-1930s, in the BBC's adult education provision. Such broadcasts consisted in the main of scripted talks by scientists themselves, not especially related to contemporary issues. The collapse of adult education around 1935, and the crisis of the Talks department, did not significantly change the format of such talks, although there was a retreat from 'science and society' talks. Topical treatment of science was revived in 1939.

The concept of public service broadcasting at the BBC embodied the notion of the broadcaster as having distinct professional skills and jurisdiction. The broadcaster's role, like that of a publisher's editor, was a gatekeeping one. It entailed selection, rejection, and framing of the selected output into a coherent suite of offerings thought suited for the listener. Producers enjoyed a high level of autonomy and had a 'hands on' approach to framing in which they worked with contributors to shape material into forms considered appropriate.

The broadcaster's gatekeeping function was regarded as the exclusive province of the broadcaster. The broadcaster was held to be outside factional interests, and therefore able to operate independently of factional interests. Nevertheless, some individuals from outside the BBC had close relationships with producers and were influential. In the world of science, Gerald Heard and Julian Huxley can be cited. These figures operated in the border off the BBC. At this stage, J. G. Crowther was not such a figure.

In 1926, J. G. Crowther proposed three key changes to the organisation of BBC science programming: setting up a science department, co-ordinating broadcasts and

[127] LaFollette (2008), pp.242–4.

[128] LaFollette (2008), pp.242–4.

having someone from a scientific background in charge. His argument was based on the importance of science in modern life, and an ‘extensive’ conception of science – that is, one in which science was a model for social policy. Crowther’s proposals would have given scientists significant control over BBC science broadcasting. His proposals were rejected.

The examination of the work of producers such as Matheson, Adams and Cox, in particular their gatekeeping and framing functions, their creative contribution to science broadcasts, and their relatively high levels of professional autonomy, give an insight into what the implications of a proposal such as Crowther’s might be for BBC production staff.

Science broadcasting in the USA provided a contrast to that in the UK. In the USA, responsibility for science broadcasting was ‘outsourced’ in various ways, initially to university science departments and museums, but increasingly to the Smithsonian Institution and Science Service. Staff at these external organisations fulfilled many of the gatekeeping and framing functions that were performed by internal production staff at the BBC.

Chapter 4 War time

4.1 Advising government; instructing the BBC

The second world war saw strenuous efforts by scientists to influence science broadcasting at the BBC. Much of this activity was associated with the British Association's still relatively new Division for the Social and International Relations of Science, which, as the last chapter showed, made overtures to the BBC before the war began. However, before examining these scientific interventions at the BBC, I will briefly look at contemporary scientific interventions with wartime government. These form a useful background against which to view the interventions with the BBC.

With the onset of the Second World War, many scientists pressed for full use of science in the war effort. One manifestation of this was the publication in 1940 of the book *Science in War*, arguing for the vital role of science and scientists in the prosecution of the war. The book was published anonymously but written by a team associated with the 'Tots and Quots' scientific discussion club, which had been founded by zoologist Solly Zuckerman in 1931. In its first phase, following its formation, the club thrived for a couple of years, but languished for most of the 1930s. It was revived by Zuckerman in 1939 to promote the effective deployment of science and scientists in the war effort.[1]

Another initiative, designed to infuse government with scientific expertise, came from Sir William Bragg. Shortly before the declaration of war he wrote to the Minister of Coordination of Defence to propose that representatives from the Royal Society, of which he was President, should study government science organisations and advise on improvements that could be made or on potentially useful scientific ideas.[2] The proposal was not accepted but a year later, with Winston Churchill now Prime Minister, another approach by the Royal Society was fruitful and in October 1940 the setting up of a wartime Science Advisory Committee was announced. Its aims were to advise government on scientific matters when advice was sought, to advise government departments, and to alert government to promising scientific developments.[3] The committee was chaired by Lord Hankey, and included Sir William Bragg. Also included were the two Secretaries of the Royal Society. Seven months later, a similar Engineering Advisory Committee was announced, also under

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1 Crowther (1970), pp. 94, 210, 222; Ziegler (2004); Anon (n.d.)

2 Rose and Rose (1969), p. 69–70.

3 *The Times* (1940), p.4.

the chairmanship of Lord Hankey, with very similar aims to those of the Scientific Advisory Committee.[4]

Hankey's Scientific Advisory Committee was less influential than originally envisaged by Bragg. Its members were unable to affect high-level decisions to the extent they would have liked.[5] This led to criticism from scientists themselves. A deputation from the Parliamentary and Scientific Committee, an unofficial backbench committee of MPS, peers and outside representatives with an interest in science,[6] visited the Scientific Advisory Committee in July 1942 to press for 'more effective scientific organisation'.[7] The deputation had no effect. Lord Snell, defending the government's position in a House of Lords debate, contended that policy judgements were a ministerial responsibility, and for a scientific body to gain too much influence would usurp ministerial responsibility.[8] Further lobbying by scientists aimed at the establishment of a scientific board to coordinate wartime research and development led to the appointment of three scientific advisers to the Ministry of Supply, although this was less than the scientists had argued for.[9] Churchill, in any case, had his own scientific advisor in the figure of F. A. Lindemann (later Lord Cherwell), who was bitterly resented by many scientists for his unrepresentativeness in relation to wider scientific opinion, and his influence on Churchill.[10] In summary, then, although scientists were able to gain a certain amount of influence at high level in the British war-time government, in the end control lay in the hands of ministers and department heads, and the role of scientists was advisory.

The outbreak of war brought changes at the BBC. The pre-war 'National' and 'Regional' split in radio broadcasting to the UK was abandoned in favour of a 'Home' service and a popular 'Forces' service (available to, and popular with, civilians). Television was suspended. The formal status of the BBC changed also. It came under the remit of the newly created Ministry of Information, which had the

4 *The Times* (1941), p.4.

5 Rose and Rose (1969), p.70.

6 The Parliamentary and Scientific Committee was formalised in 1939, and by 1959 had 120 MPs, 58 peers and 109 representatives of scientific societies, professional institutions and industrial research organisations. The Committee's role was to inform politicians about the potential of science in government and society. During the Second World War, and for approximately a decade after, it acted as a non-party lobby for science. Vig judges that it contributed modestly to parliamentary awareness of science, although it never officially considered important scientific legislation. (Vig, 1968, p. 27)

7 Rose and Rose (1969), p.70.

8 Rose and Rose (1969), p.70–71.

9 Rose and Rose (1969), p. 71.

10 Vig (1968), p.17.

right of censorship over BBC broadcasts. In 1941, a new broadcasting advisory system came into play. Following a recommendation of an investigating committee, two advisors from the Ministry of Information were imposed on the BBC in February and March 1941, one to deal with home matters (that is, ones relating to services for BBC's listeners in Britain) and one dealing with foreign matters (that is, services for listeners overseas).[11] The adviser on home matters, was, in fact, already a BBC staff member, who was seconded to the Ministry of Information so that he could be appointed by the Ministry as an advisor to the BBC. By September 1941, the two new advisers were manoeuvring to be accorded the status of Controller (a high-level managerial position in the BBC), with direct access to the Director General. Their manoeuvres were successful, and in the process an existing BBC manager was ousted.[12] BBC managers did not submit willingly to the loss of autonomy entailed in the Corporation's subordination to the Ministry,[13] and managed to reassert a measure of independence. Nevertheless, certain aspects of programming policy were imposed on the BBC from outside. For example, in 1940 the Ministry required the BBC to initiate a North American service, directed at listeners in the USA and Canada;[14] and by 1942 no more than 60 minutes per week of domestic Talks output could be spared for subjects unconnected with war work.[15]

Another initiative by Sir William Bragg came in October 1939, when he approached Kenneth Lee at the Ministry of Information to argue that the public needed to understand the importance of science in the war effort:

> As you know the efficiency of modern weapons of war and means of defence depends on science and the application of science. Every ounce of science is wanted to help turn the scales. If that is generally known, from the common people up to the legislators, scientific knowledge is more likely to be relied upon in the nation's effort.[16]

Bragg wanted the Ministry to coerce the BBC into having a permanent part of its schedule devoted to science programmes aimed at the general listener.[17] The

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11 Briggs (1970), p. 304–5.

12 Briggs (1970) pp. 310

13 Briggs, (1970), p. 91

14 Camporesi (2000), 140.

15 BBC (1942), p.4. This restriction might have been imposed before 1942, but 1942 is the earliest date for which I have seen t mentioned.

16 WAC, W. H. Bragg File no. 2, quoted in Friday (1974, p.74).

17 Friday (1974), p.74.

programmes would show the practical application of science in industry, business and defence. Bragg's letter to the Ministry of Information was forwarded directly to the BBC, and the proposal rejected.[18] Implicitly, the Ministry regarded this as a matter for the BBC to decide on, rather than the Ministry itself.

Although Bragg's intervention was rejected, he had correctly identified shortcomings in the BBC's science output, which the BBC's Director of Talks acknowledged in 1942. The decline was caused by the departure of Ian Cox for war service, and a heightened sensitivity to the political aspect that had characterised a number of pre-war science broadcasts.[19] Bragg's proposed series on science for the general listener could have been rejected at the BBC simply because there was no longer a science specialist on the production staff. (The overseas services, however, had a science specialist, Anthony Weymouth.)

4.2 British Council approaches the BBC

In 1941 the British Council created a Scientific Committee within its Education Department. It had its origins in a report submitted to the Ministry of Information by biochemist and Sinologist Joseph Needham following a lecture tour in the USA in the summer and autumn of 1940 (Figure 4.1).[20] During the tour, Needham had stressed to his American audiences that the war in Europe was, among other things, a threat to science in Europe: 'If the Nazis should win in Europe, science will be set back for several generations, perhaps longer,' he told them.[21] Needham found a growing pro-British and anti-Nazi sentiment in the USA, especially following the evacuation of Dunkirk, the collapse of France, and the London Blitz.[22] He found members of his audiences curious to know more about British science, but observed that the supply of pro-British propaganda in the USA was 'woefully deficient'. This deficiency contrasted markedly with the more effective provision of pro-Nazi propaganda. There were, for instance, Nazi bookshops in New York city.[23]

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[18] Friday (1974), p.74

[19] WAC R51/523/3 Memo from Director of Talks (George Barnes) to Controller Home Service (Richard Maconachie), 14 January 1942.

[20] University of East Anglia, Zuckerman Archive SZ/TQ/2/7. Letter from Needham to Zuckerman, 16 January 1941.

[21] University of East Anglia, Zuckerman Archive SZ/TQ/2/7. Report on Four Months' Tour in the United States, June-November 1940, by Joseph Needham, p. 4.

[22] University of East Anglia, Zuckerman Archive SZ/TQ/2/7. Report on Four Months' Tour in the United States, June-November 1940, by Joseph Needham, p. 4.

[23] University of East Anglia, Zuckerman Archive SZ/TQ/2/7. Report on Four Months' Tour in the United States, June-November 1940, by Joseph Needham, pp. 6 and 7.

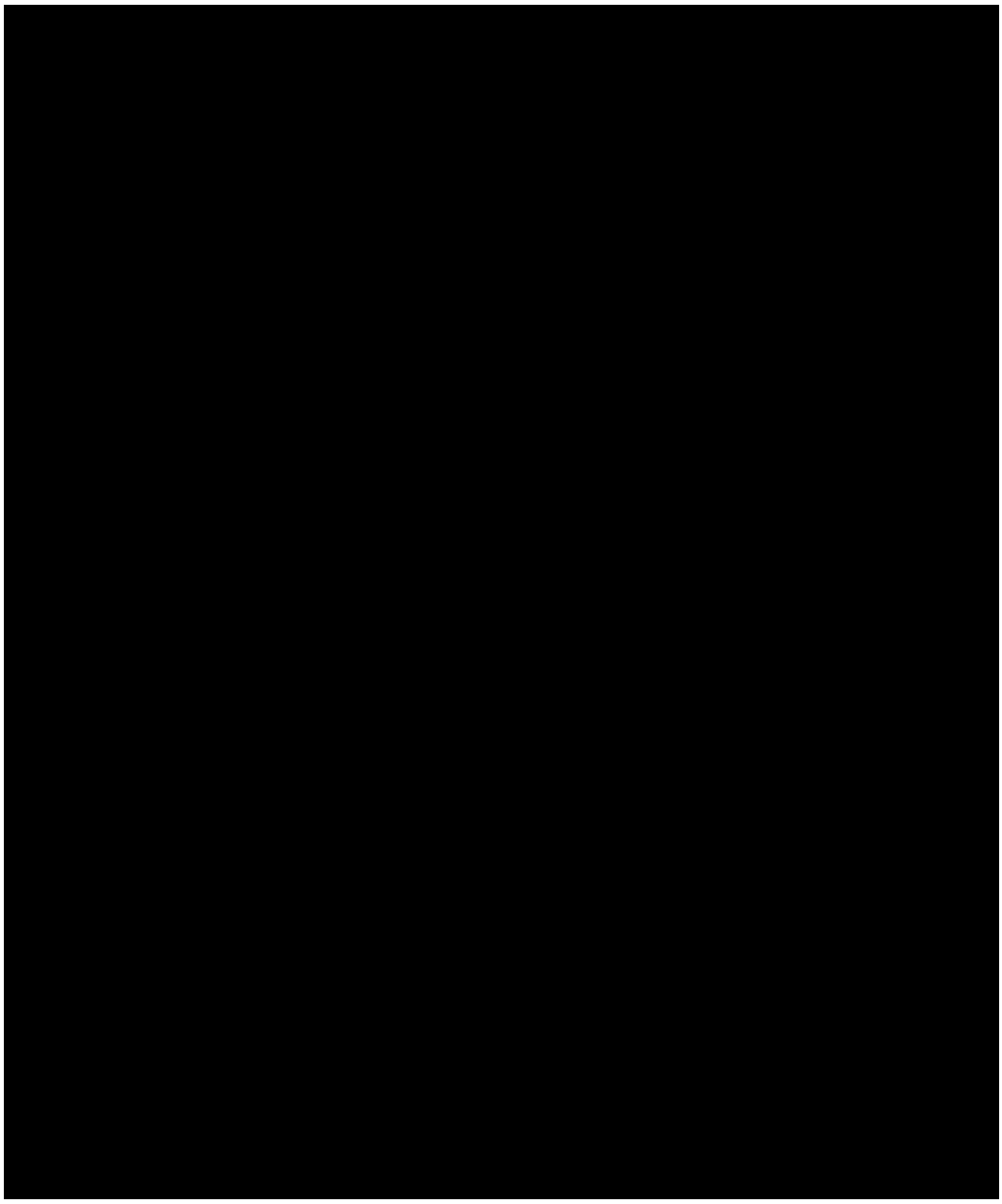

Figure 4.1 A page from Joseph Needham's report for the Ministry of Information on his lecture tour of the USA in 1940. From University of East Anglia, Zuckerman Archive SZ/TQ/2/7. Report on Four Months' Tour in the United States, June-November 1940, by Joseph Needham, p. 5.

Needham gave a copy to Solly Zuckerman. Discussions followed between representatives of the Ministry, the British Association, the Royal Society, Julian Huxley and Solly Zuckerman about the best way to institute a system of propaganda for British Science directed principally at North and South America. A pattern had already been set by the British Medical Association, which had established a Medical Information Service to publicise British medical achievements in the Americas.[24] The British Association's Division for the International and Social Relations of Science was keen to undertake the work, and sent a proposal to the Ministry of Information explaining how it would organise the work and the resources it would require ('two qualified editors, and a clerical staff of two or three at the beginning', together with translators). [25] The Ministry of Information, however, decided that the British Council was the appropriate body.[26]

A Science Committee of the British Council was set up, chaired by Sir William Bragg.[27] In April 1941, J. G. Crowther was invited to become the Committee's secretary, with responsibility for running the science information service which was intended to advertise British science abroad. [28] He had, by this time, made a name as a science populariser having published several books about science and contributed many science stories to the *Manchester Guardian*. In addition, he was a member of the Tots and Quots, and had contributed to their anonymously published book *Science in War*, both as author and editor.[29]

Crowther found that his working life at the British Council was soon improved by a change of atmosphere following Hitler's invasion of the USSR. Anglo-Soviet relations improved, and left-wingers, such as himself, were accorded more respect. According to Crowther, there were several staff at the Council of strong right-wing outlook, and few to the left.[30]

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[24] University of East Anglia, Zuckerman Archive SZ/TQ/2/7. Draft letter from Zuckerman to Richard Gregory, 13 January 1940.

[25] University of East Anglia, Zuckerman Archive SZ/TQ/2/6. Letter and proposal from Howarth to John Rodgers, Ministry of Information, 7 March 1941; and SZ/TQ/2/7. Letter from Zuckerman to Howarth, 25 February 1941.

[26] University of East Anglia, Zuckerman Archive SZ/TQ/2/7. Letter from Lord Melchett to Solly Zuckerman, 26 March 1941.

[27] Crowther (1970), p. 228.

[28] Crowther Archive , Box 85, letter from B. Ifor Evans [?] at British Council to Crowther, 2 April 1941.

[29] Crowther (1970), p. 213.

[30] Crowther (1970), p.229.

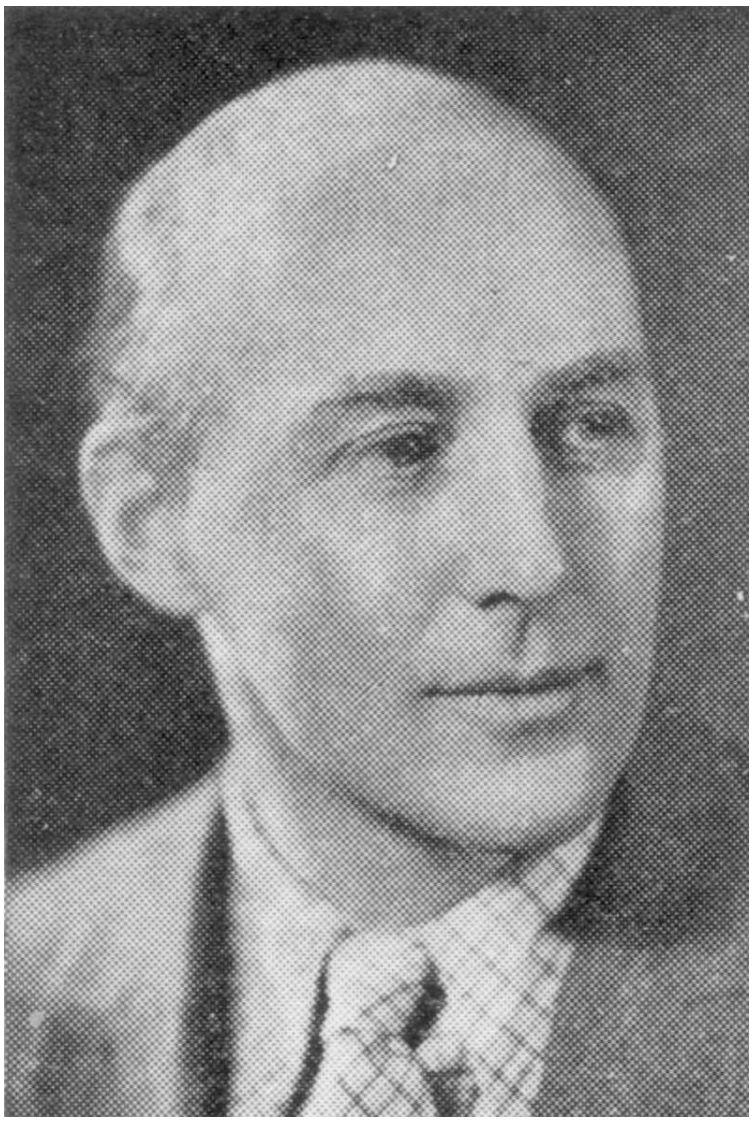

Figure 4.2 Science writer J. G. Crowther, aged 37, around 1938[31]

[31] Illustration from the cover of Crowther (1938)

At first it was not clear what the practical work of the Science Committee should be. Crowther's own account has him designing the Committee's job almost single-handedly.[32] One of his main responsibilities was publishing *Monthly Science News*, which was distributed abroad in several languages.[33] Surviving copies in the Crowther Archive show it to have consisted typically of a single folded sheet making, four pages, printed double column. It contained five or six stories on science and technology, and the lead story was generally a biographical item about a scientist, accompanied by photograph. Stories were unsigned.

On 3 September 1941, Bragg, Crowther and one other representative of the Scientific Committee of the British Council met the BBC's Director General and Controller of Overseas services to see whether the Corporation would be willing to cooperate in a project aimed at overseas listeners.[34] The response was favourable, and the outcome was a series entitled *Science Lifts the Veil*, broadcast weekly on the Empire Service from 5 January 1942 to 6 April 1942. The series concerned 'the conquest of the sub-visible Universe'.[35] Broadcasters included William and Lawrence Bragg, crystallographer J. D. Bernal, biologist Cyril Darlington, physicist John Cockcroft and physicist Patrick Blackett. By his own account, Crowther was largely responsible for organising the series.[36]

Subsequently Lawrence Bragg sent a request to the Director General of the BBC that the series be repeated on the Home Service for domestic listeners. Bragg and his committee felt that the series could be a corrective to the public's misapprehension and misunderstanding of science and its place in society.[37] Bragg's request was passed down to George Barnes, the Director Of Talks, who was not enthusiastic. Barnes judged the talks to have been:

> .... very uneven indeed. Some have been brilliant – namely Sir William Bragg's own introduction – but others have been exactly the kind of talk which we have had in the past and which has not secured a wide audience. They have been given by the greatest British authorities, but the speakers would not, in our opinions, make contact with a Home audience. We

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[32] Crowther (1970), p. 228.

[33] Crowther (1970), p. 228.

[34] WAC R51/529, memo 22 December 1943.

[35] WAC R51/523/5, undated memo/press release.

[36] Crowther (1970), p.230. According to Crowther, audio recordings were made of William and Lawrence Bragg, Robert Robinson, Patrick Blackett, J. Cockcroft, and a discussion between William Bragg and J. D. Bernal. (Crowther, 1970, p.231)

[37] WAC R51/523/3, letter 2 March 1942.

believe, in fact, that we can do something better, but this will take time, ...[38]

Whereas Bragg was motivated by a need to correct a misapprehension of science, Barnes, on this evidence, was motivated by the need to 'make contact with a Home audience'. The difference reveals the contrasting 'cosmologies' of the scientist and the professional broadcaster. For the scientist, the case for re-broadcasting is framed in terms of the public's misapprehension of science. For the broadcaster, the case would need to be framed in terms engagement with the listener. Although *Science Lifts the Veil* was not re-broadcast domestically, the talks were published as a book.[39]

4.3 ASW and BA approaches to the BBC, 1941

The British Council's visit to the BBC in September 1941 was the first of an irregular series of war-time delegations and communications directed at the BBC regarding its science coverage. Not long after the British Council's visit, further letters arrived from the Association of Scientific Workers (ASW)[40] and from J. G. Crowther, this time writing on behalf of the British Association. Both letters contained offers to advise the BBC on its science coverage.[41] The Association of Scientific Workers' letter appears not to have survived.

The arrival of these two letters at the BBC in late 1941 within a short space of time appears not to be coincidental. In July 1941, at a Divisional committee meeting of the British Association's Division for the Social and International Relations of Science, Crowther was co-opted to the committee and its executive subcommittee.[42] At the same meeting, the committee began to formulate plans for a three-day conference on 'Science and the World Order', to be held in September 1941.[43] Following the conference, in December 1941, a subcommittee was formed to extend public understanding of the benefits of science. Crowther was among its members.

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[38]WAC R51/523/3, memo 4 March 1942.

[39] Bragg *et al*. (1942)

[40] The Association was, in effect, a trade union (though not affiliated to the TUC), formed in 1927 out of the ashes of the National Union of Scientific Workers, which itself had been formed in 1918. The National Union of Scientific Workers had fought for higher salaries and greater security for its members. Membership declined during the 1920s partly through conflict over its role. The new Association of Scientific Workers succeeded in attracting many members from academia, and campaigned for the importance of science to be recognised, especially in Parliament. (Wersky, 1978, pp. 39–41.)

[41]WAC R51/523/3, memo 14 January 1942.

[42] University of East Anglia, Zuckerman Archive SZ/TQ/2/6. Minutes of a meeting of the committee of the Division for the Social and International Relations of Science, 17 July 1941.

[43] The conference was held on 28–8 September 1941. Reports are in British Association for the Advancement of Science (1942).

This subcommittee noted the receipt of a memo from the ASW which sought the co-operation of the British Association 'in moving the BBC to give science a more effective place in broadcast programmes.'[44]

Crowther's letter to the BBC, on behalf of the British Association, in December 1941, was addressed to Norman Luker, at the time the Assistant Director of Talks:

> The British Association has recently formed a Committee for investigating methods of extending a better understanding of science. They have asked me to join it. Among the questions they would like to consider is the problem of broadcasting on science, especially to British home audiences. I wonder whether you would care to have lunch with me some time soon in order to discuss this subject.[45]

This letter led to a meeting with Luker, after which Luker reported the meeting to George Barnes, the Director of the Talks Division:

> The British Association has set up a sub committee for the popularisation of science, and J. G. Crowther had a long talk with me about its keen wish to make a fuller use of broadcasting for this. He tells me he can guarantee a flow of important and interesting material and a group of young and authoritative speakers. I have explained my misgivings in view of earlier experience. He is letting me have a note of the sort of material he has in mind. [46]

Unfortunately the nature of Luker's misgivings is not explicitly stated. However, Barnes's response again indicates what the BBC would seek from a closer relationship with the British Association. He suggested that some of the speakers promised by Crowther could be used occasionally for short items in *Ariel*, a long-running regular magazine-style programme.[47] In other words, Barnes was proposing a distinctly modest use of the resource being offered, and no sense of engagement with a mission to promote the public understanding of science.

Barnes was especially exercised lest the British Association's new committee be politically motivated. He was worried about broadcast science being used as a platform for the promotion of political opinions:

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[44] University of East Anglia, Zuckerman Archive SZ/TQ/2/6. Minutes of a meeting of the committee of the Division for the Social and International Relations of Science, 3 December 1941.

[45] WAC R51/523/3, letter 24 December 1941 from J. G. Crowther to N. Luker at BBC.

[46] WAC R51/523/3, memo 7 January 1942 from N Luker to Director of Talks.

[47] WAC R51/523/3, memo 12 January 1942.

> First, however, it is essential to make clear that the subject as treated by us must be divorced from politics and we badly need confidential advice from scientists about the membership of the subcommittee [i.e. the subcommittee of the Division for the Social and International Relations of Science designed to extend public understanding of the benefits of science].

Barnes was also wary of ceding too much control to the British Association. The scientific speakers in the *Ariel* series should not appear to be under the control of the British Association:

> I see myself no point in doing the thing [that is, including short scientific features in 'Ariel'] under the auspices of the British Association ...[48]

Crowther's intervention with the BBC on behalf of the British Association has more than a little in common with one a few months later by the Chief Public Rations Officer at the Ministry of Health – a man called Wilkinson. As documented by Karpf, Wilkinson wrote to the Director of Talks suggesting the insertion of health-related matters into existing broadcasts, and proposing that Ministry staff be interviewed on medical news. Staff at the Ministry, in addition, should be able to propose programme ideas directly to producers. The Head of the Talks Department referred to this intervention as 'infiltration', and objected strongly. Wilkinson rejoined that as dissemination of health information was the responsibility of the Health Ministry, the BBC should henceforth arrange medical broadcasts in conjunction with the Ministry. Expansion of the Ministry of Health's activity was thus sought through 'reduction', to use Abbott's term for the assimilation of a new activity to professional group's jurisdiction. In this case, reduction entailed a claim that a new role (medical broadcasting) was a version of work already within the jurisdiction of the Health Ministry. The matter was resolved by a new agreement allowing the Ministry to comment on, but not control, medical broadcasts.[49] Crowther's less extreme form of 'reduction' sought to bring science broadcasting closer to the work of the British Association's popularisation subcommittee by 'guaranteeing' a flow of authoritative speakers.

These scientific interventions by the British Council and the British Association had a genuine, though a limited, effect. First of all, there was an acknowledgement by Barnes that science had been poorly served since the outbreak of war. Barnes wrote to the Controller of the Home Service:

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48 WAC R51/523/3 memo 12 January 1942, Director of Talks to Assistant Director of Talks.

49 Karpf (1988), pp. 41–2.

> Too few talks on science have been broadcast in the Home Service since the outbreak of war, when the Department lost the services of Ian Cox, the producer charged with this side of its work. The lack of a producer in contact with scientists and the importance of avoiding the political bias shown in many popularisations of scientific subjects has meant that broadcasts have tended to go by default. In seeking to re-establish them the first necessity is for an outside consultant.[50]

It is not clear why Barnes thought an outside consultant necessary, but it is possible that, in the absence of a specialist replacement for Cox, science broadcasts would have to be handled by a non-specialist producer, and Barnes considered that such a person would need expert advice. The Talks Advisory Council and the General Advisory Council had been suspended at the outbreak of war, so there was no access to the kind of advice their scientific members had given. For a remedy, Barnes turned not to the British Association but to the more august Royal Society. He drafted a letter to the Society, which was despatched over the signature of the BBC's Director General, Frederick Ogilvie. It requested that:

> ... [the Corporation] might be allowed to consult the Secretaries of the Royal society *ex officio* on matters of this kind [i.e. scientific advice]. Our Director of Talks and the heads of other relevant departments would thus have the great advantage of the Society's advice both on plans for broadcasts on scientific subjects and upon the qualifications of particular speakers proposed.[51]

In turning to the Royal Society, Barnes was implicitly acknowledging the appropriateness of the established institution collaborating with 20-year-old broadcasting organisation. It was a gesture that simultaneously honoured the Society and claimed status for the BBC as a part of Britain's cultural establishment. Barnes observed that the secretaries of the Royal Society were in touch with the latest scientific developments and were able to take the advice of any Fellow of the Royal Society.[52] Barnes considered the Royal Society to be an authoritative body, unlike the British Association, which was 'merely a popularising body'.[53] A. V. Hill, one of the Royal Society Secretaries, as it happens, was himself on the committee of the British Association's Division for the Social and International Relations of Science,

[50]WAC R51/523/3 memo 14 January 1942.

[51]WAC R51/529, letter from Ogilvie to Hill, 21 January 1942.

[52] WAC R51/523/3, memo from Director of Talks to Controller (Home), 14 January 1942.

[53]WAC R51/523/4, memo 30 September 1943.

though he was one of its politically non-radical representatives. He was at this time an Independent Conservative Member of Parliament.

The advisory arrangement between the Royal Society and the BBC was ratified by the Society and remained in place until the end of the War. At the Royal Society's request, the arrangement was kept secret outside the BBC.[54] Consultation by BBC producers was on the initiative of the producers, and producers could seek advice elsewhere if they wished. There was little risk here of 'infiltration' of the BBC by outsiders.[55]

One of the first pieces of advice Barnes sought after the institution of the new arrangement related to a proposed broadcast by H. A. Mess, Reader in Sociology in the University of London on *The Scientific Study of Society*. In February 1942, Barnes, approached Hill at the Royal Society for advice on both the broadcast and the broadcaster. Barnes wanted to know whether Mess's application of 'scientific method' to society was likely to be controversial. He asked because there were well tried techniques for handling controversy in broadcasts. A typical method was to have a studio discussion with someone holding a contrary view, so that the BBC would not be seen to promote unpalatable political propaganda. Hill's reply, however, shows more concern for guarding the propriety of 'science' than for answering Barnes's question:

> Your question puts me in some difficulty. Firstly I know nothing at all about Mess. This is not his fault, but simply that we are in totally different fields: he probably knows nothing about me. Then, secondly, I expect that he uses the word 'scientific' where I should not use it.
>
> [...] the regard which the public has for natural science gets transferred automatically to anything which calls itself scientific.[...] This word 'science' has been considerably exploited by advertisers [f]or all kinds of saleable goods: there is now a danger that it might be exploited also by advertisers of ideas.[56]

Thus Hill did not mind Mess plying his trade as a social scientist in relative obscurity – in fact, Hill was fairly tolerant. What was unacceptable for Hill was that he should be presented to listeners as a legitimate scientist when he might actually be an

[54]WAC R51/529, Director of Talks to Controller, Home Service, 19 October 1943.

[55] WAC R51/529, extract from minutes of Programme Policy meeting 21 December 1943 says: 'Divisions should as a temporary wartime measure seek advice on scientific subjects (when such advice was felt to be necessary) from the Secretaries of the Royal Society. Divisions were free to go elsewhere for advice in case of need.'

[56]Royal Society A. V. Hill Archive, letter from Hill to Barnes 9 February 1942.

'advertiser of ideas', by implication a qualitatively different activity from that engaged in by scientists. In what looks like a clear instance of boundary work,[57] the word 'scientist' is seen as having special, authoritative status which pretenders covet, but which is eroded when the word is appropriated by impostors. These impostors 'advertise' their ideas, suggesting they promote their ideas for ulterior reasons.

4.4 BBC science broadcasting review

Another outcome of the interventions by the British Council and British Association in 1941 was an internal BBC discussion of its science broadcasting. This took place in March 1942. It was not a formal or wide-ranging inquiry. Rather, it was an attempt by Barnes to look for ways of remedying the dearth of science coverage on the BBC that had followed the outbreak of war. In connection with this review, Barnes consulted his colleagues in the Schools and Education divisions, and some outside scientists, notably the Secretaries of the Royal Society, Edward Appleton (ionospheric researcher and, at this time, secretary of the Department of Scientific and Industrial Research, DSIR), C. P. Snow (physicist, novelist and war-time administrator in a Royal Society body to deploy scientific talent for the war effort), Max Newman (mathematician) and E. N. da C. Andrade (physicist and for much of the War associated with the Ministry of Supply.[58] Many of these proposed ideas for speakers and talks were subsequently followed up by Barnes.

One of the several points of interest of this internal review is that it gives us the voices of BBC planners and producers themselves regarding science broadcasting – what it is for, who it is for, and so on. In particular, Richard Palmer, of the Education Division, supplied a report *Broadcast Science* to the internal review. In it he proposed several functions for science broadcasting:[59]

> 1 Satisfaction of interest. [...] A special public for popular science has arisen in wartime. Many people, especially young women, are using technical instruments or processes in the Services or the supply industries. [...] Is it not possible to use this temporary interest to give a wider understanding of science and its applications? [...]
>
> 2 Provision of useful information. [...] The Ministry of Food's popularization of food values, and the Ministry of Health's slogans on the spread of disease are simple examples. Are there other fields of everyday

[57] Gieryn (1995 and 1999).

[58] Biographical information from Ratcliffe (2004) [Appleton], Weintraub (2004) [Snow], Wylie (2004) [Newman] and Cottrell (2004) [Andrade].

[59] WAC R51/523/3, Richard Palmer, *Broadcast Science*, 2 March 1942.

good citizenship or of personal wisdom in which some simple knowledge of principles would help? [...]

3 Appreciation of science as a method and an attitude, and as part of a common heritage. [...] Broadly speaking I have three things in mind:

(a) The scientific attitude. This has many components, but the most important, I think, is the belief that knowledge is to be gained by seeking facts and applying reason to them. [...] [Fact collecting] has still to be established among many ordinary people. The first impulse is to argue, rather than to see whether relevant facts are available, and then apply reason to them skilfully.

(b) Scientific method. There is no single scientific method of universal application but there are certain devices, of fairly general application, by which scientists safeguard their thinking. [...] They should be part of the equipment for life of the ordinary man and woman.

(c) Science as part of a common heritage. Ordinary people are apt to think of the scientists as someone standing apart from the rest of society [...]. This attitude contains the germs of something really dangerous, a barbarian hostility to reasoned enquiry. [...][60]

Here Palmer identified the several functions of science broadcasting. The first was the satisfying of an audience demand – in this case an exceptional demand because of the war. A number of commentators referred to the same phenomenon. For example, at a British Association conference the following year, to be discussed below, two speakers referred to the scientific nature of the war causing an exceptional general interest in science.[61] In addition, other BBC producers made similar observations.[62]

Further functions for science popularisation identified by Palmer were the utilitarian function in supplying practical information (2); the 'extensive' view of science, in which it served as a model of rational enquiry whose methods should suffuse other areas of life (3(a) and (b)). Finally, Palmer saw science as part of the cultural

[60]WAC R51/523/3, Richard Palmer, *Broadcast Science*, 2 March 1942.

[61] Crowther, J. G. (1943b), p. 336. Calder (1943), p. 334.

[62] For example, '... a very large section of the community is, in this technological age, now "technically minded" and not "literary."' WAC R51/524/4, memo from Trevor Blewitt to Director of Talks, 24 May 1943.

heritage (3(c)). Items 3(a), (b) and (c) in particular overlap with the modern 'public understanding of science' cause.[63]

Only the first of Palmer's arguments was about satisfying an existing interest in the listener. All the others were about influencing the public's beliefs and attitudes. In this respect Palmer showed himself to be like many of the scientists who lobbied the BBC about its science coverage and who believed that the BBC should try to shift public perception of science in a direction favourable to science. However, there is no suggestion that Palmer thought control of science broadcasting should be devolved to scientists, even though in several respects his view of the purpose of science broadcasting is close to the ones advanced by scientists themselves.

Palmer went on to give practical examples of how his analysis could be, or had been, realised as actual broadcasts. He mentioned that the Schools Department had used dramatisations and sought to put science in its social and historical context. Finally he added:

> 4 Anti-astrology. Can anything be done about the tremendous growth of astrology in recent years? Perhaps this is the sort of thing that is best countered by Tommy Handley and Hi Gang [popular wartime comedians]. Can broadcasting help to laugh it down?[64]

Commenting briefly on Palmer's paper, Mary Somerville, Director of Schools Broadcasting, wrote to Barnes that she would be inclined to stress the part where Palmer had referred to 'Science as part of a common heritage'.[65] But Somerville's main concern was to categorise the audience and its mental capacities. She identified three main groups based on educational attainments, regarded as separate from social class:

> 1 Well informed people who would be interested to hear of new research work [...]
>
> 2 Less well educated people who already have the capacity for taking an interest in some science ... without having the training to satisfy their own interest.
>
> 3 The uninformed and uneducated man (and woman) in the street who are to be found in all classes of the community and who retard social progress

[63] Gregory and Miller (1998), pp.10–16, give a resumé of modern arguments for public understanding of science.

[64] WAC R51/523/3, Richard Palmer, Broadcast Science, 2 March 1942.

[65] WAC R51/523/3, memo 3 March 1942

> in all departments of life when co-operation depends on the acceptance of scientific principles.[66]

The third group is the one where broadcasting had a special role, according to Somerville. It was a role which had been sorely neglected ('I don't think we have yet put our backs into the job.').

Somerville's three-way stratification of the audience was not new. In 1938, a senior talks assistant had written a memorandum which divided listeners into three categories, A, B and C. Group A were the 'intelligent and well informed'. Group B were 'intelligent and not so well informed.' Group C, the largest of the potential audience, included the 'not so intelligent and mostly uninformed' who, because of their 'extreme simplicity' would only listen to 'adventure' or 'personality' talks'.[67]

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66 WAC R51/523/3, memo from Mary Somerville to Director of Talks 3 March 1942.

67 Quoted in Cardiff (1980), p.35. Group B, according to this staff member, 'formed the most important target group because it comprised a 'considerable serious-minded public anxious for mental pabulum which we are well placed to give them.'

Figure 4.3 Mary Somerville, Head of Schools broadcasting[68]

[68] Source: Palmer (1947).

Somerville shared with Palmer the idea that part of the function of science broadcasting was to 'correct' some deficiencies in the listeners' outlook. At the time of Palmer's paper she proposed:

> ... a very simple series on the 'wonders of science' lines [...] It might have little direct effect but it would introduce a new element into the environment of listeners, and it is after all the environmental influences that count with the astrology mongers, and people who 'don't hold with science', who won't take insulin, or feed their babies properly, or co-operate in a hundred and one other spheres of modern life, because they continue as individuals to live in the dark ages.[69]

She countenanced external advisors who would have much more of a 'hands on' role than the secretaries of the Royal Society had:

> Could we not set up a special panel of advisors, made up in part of scientific experts, and in part of consumer research experts, with which producers would work at experiments in presentation technique?[70]

I have dwelt on Somerville's and Palmer's views at some length because I want to show that there were, at times, people within the BBC whose ideas about science broadcasting had much in common with those of lobbyists outside the BBC. Such producers were not shy about the notion that the listeners ought to be more versed in science for their own good, and that science broadcasting could correct errors of thought.

Despite the alignment of Palmer and Somerville with some of the aims of the scientific critics of the BBC, there is no record of them suggesting that the management of science broadcasting within the BBC should be changed, for instance by bringing it into a single department, or by appointing a high-level scientific manager as its Head.

Barnes's tour of scientists and advisers as part of his review led to plenty of suggestions for speakers and subjects: C. G. Darwin on the National Physical Laboratory, Charles Singer on the history of medicine, Patrick Blackett on Rutherford or J. J. Thomson, J. D. Bernal on the organisation of science in Russia ('with a warning that he is not to talk on politics'[71]), and numerous others. Barnes and his colleagues pursued these proposals, and the outcome was an increase in the

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69 WAC R51/523/3, memo from Mary Somerville to Director of Talks 3 March 1942.

70 WAC R51/523/3, memo from Mary Somerville to Director of Talks 3 March 1942.

71 WAC R51/523, memo 24 March 1942 from Director of Talks.

amount of science broadcasting. A. V. Hill complimented Barnes and his colleagues on their work and on their plans for future science broadcasts.[72]

4.5 Wartime science on the Overseas Services

The BBC's Overseas Services were expanded at the outbreak of the second world war. The most significant part of the Overseas Services' science output was the weekly Science Notebook, produced for most of the war by Anthony Weymouth.

As mentioned earlier, the series *Science Lifts the Veil*, devised by William Bragg and J. G. Crowther, was broadcast on the Overseas Services in early 1942. The series was anomalous in BBC terms because of the significant involvement of an outside body (the Scientific Committee of the British Council, for which Bragg and Crowther worked) in the formulation of the series.

Following this series, the Scientific Committee of the British Council became a source of assistance for producers of Overseas science broadcasts. Both Sir William Bragg and J. G. Crowther were called on by producers for help.[73] Crowther especially assumed this function following Bragg's death in March 1942. An instance of the kind of help Crowther gave dates from September 1941, when Eric Blair (the writer George Orwell), then a producer in the Overseas Services, wrote to Crowther:

> I am writing to ask whether you can advise me about someone to do a talk in the Indian Service. We have a series called 'I'd Like it Explained', in which experts on various subjects of current importance answer questions put to them by an Indian interviewer. We want to have a talk on ersatz and raw materials, and have had some difficulty finding a suitable speaker. [74]

Strikingly, Blair here asks Crowther to 'advise' him. This word became charged with significance in a later exchange regarding Crowther's role in relation to the Overseas services. Producers in the Overseas Services believed, incorrectly, that the advisory arrangement initiated by George Barnes with the Royal Society was only for domestic broadcasts.[75] When the Controller of Overseas Services was made aware of the official status of the Royal Society Secretaries as advisors for all the BBC services, he insisted that what Crowther provided was 'information' rather than 'advice':

[72]Royal Society Archives, A. V. Hill correspondence, letter 14 September to George Barnes.

[73] WAC R51/523/4 memo from Controller of Overseas Services to Director General, 24 December 1943.

[74] Crowther Archive, Box 159, letter Blair to Crowther, 21 September 1941.

[75] WAC R51/523/4 memo from Controller of Overseas Services to Director General, 24 December 1943.

> [...] close contact was established from Overseas Service with Sir William Bragg and with Dr J. G. Crowther, [sic: Crowther had no university qualifications] the Committee's Secretary. After leading us into an unduly heavy series of Overseas talks entitled 'Science lifts the Veil' the contact later became more valuable and this depended very much on the personal interest and influence of Sir William Bragg especially over contacts with individual scientists whose services we were anxious to engage. Since Sir William Bragg's death [10 March 1942] we have found this contact less useful but for certain services (the Chinese for example) the British Council (with J. G. Crowther as a personal contact) has provided useful channels of information [emphasis in original] rather than authoritative scientific advice. [76]

The above memo appears to be an attempt by the Controller of Overseas Service to exculpate himself for not following official advisory procedures, although the advisory arrangement with the Secretaries of the Royal Society was not meant to exclude the use of other advisors.[77] On the other hand, it could be an attempt to minimise the influence Crowther had had on broadcasts, in view of the wariness regarding Crowther exhibited by some BBC managers (as explained below). Either way, the Controller's self-defence depended on making a distinction between 'advising' and 'providing channels of information', with the suggestion that providing channels of information was less problematic than advising. The distinction, though, looks somewhat spurious in view of Blair's explicit seeking of advice from Crowther. The fact that the distinction mattered, though, and could be used as a defence, indicates how relations with the outside world could be managed by BBC managers in a way that protected the BBC's authority. That is to say, relationships could be framed in such a way authority was retained within the BBC, even when the BBC was dependent on outsiders. The subtle grading of relationships was part of the way in which authority was constructed.

Whatever the nature of Crowther's services, whether supplying information or advising, they were much appreciated by Anthony Weymouth, the main science producer for the Overseas Services. In a letter to Crowther, Weymouth wrote:

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[76] WAC R51/523/4 memo from Controller of Overseas Services to Director General, 24 December 1943.

[77] WAC R51/529 Memo from Sir Richard Maconachie to Director General, 22 December 1943. This memo refers to a communication on 27 January 1942 when the Director of Talks informed the Talks Department that although an advisory arrangement had been made with the Secretaries of the Royal Society 'there is no objection, of course, to producers taking other advice'.

> May I take this opportunity of thanking you for the ready way you have given help to me whenever I have asked for it.[78]

Distinguishing here between 'advising' and 'providing access to information' looks subtle to a high degree, as with the Blair extract quoted earlier. In a similar vein, an Overseas producer asked Crowther to assist a new member of BBC staff by allowing her to call him occasionally 'when she is in need of advice'.[79] In another context, a 1943 BBC contract refers to a series on *Science and Agriculture*, directed at listeners in the West Indies, for which Crowther 'himself arranged the subjects and speakers for the seven talks in the series,' besides giving one of the talks himself.[80] And in 1945 an Overseas producer wrote to the Assistant Controller, European Service to say that: 'Crowther is a good friend of the BBC and has helped a lot with science talks.'[81] Thus the actual practice of producers looks to have been fairly informal and pragmatic – they took help from the source that could provide it, and were grateful for it. There seemed little distinction between 'information' and 'advice', and the advisor's contribution might even stretch to planning a talk or a series of talks, as with *Science and Agriculture* referred to above. A corollary of their having this high degree of producer autonomy is that producers could unwittingly contravene formal procedures, such as those relating to advice. There is a further instance of this below in Section 4.10 in connection with the proposed series *Science Magazine*.

Crowther was himself a fairly frequent broadcaster on the Overseas Services at this time. During the war and immediate post-war period he gave over 40 broadcasts. However, for reasons that are not clear, but possibly connected with his left-wing politics, he was regarded with suspicion in the Talks Department, as shown by the following incident. In January 1943, mechanical engineer H. L. Guy, a member of the Scientific Committee of the British Council, wrote to the BBC to suggest that the Corporation might benefit from an advisory committee of scientists and engineers. He cited the Scientific Committee of the British Council as a suitable body, but conceded that the Committee's Secretary, Crowther, could be a stumbling block. According to a BBC memo reporting Guy's proposal, written by a member of the Talks Department, 'Dr Guy made it abundantly clear that he took the same view as

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78 WAC Crowther Contributor File, letter 7 December 1943, Weymouth to Crowther.

79 WAC, Crowther Contributor File, letter from G. Ivan Smith to Crowther, 12 September 1945.

80 WAC, booking requisition for series 'Calling the West Indies', *Science and Agriculture*, January 1943. This series was produced by Una Marson, the Jamaican writer and broadcaster, and BBC employee from 1941–6. Marson was one of the earliest, and possibly the earliest, black employees of the BBC. (Jarrett-Macauley, 1998)

81 WAC, Crowther Contributor File , Smith to Assistant Controller European Service, manuscript addition 17 June 1945.

many of us about Crowther.'[82] Guy's suggestion of making the Scientific Committee of the British Council an official advisory body came to nothing.

4.6 'Science and the Citizen: the Public Understanding of Science' conference 20–21 March 1943

On 1 December 1942 the HMSO published the report *Social Insurance and Allied Services*, produced by a committee chaired by Sir William Beveridge. It proposed the setting up of national schemes of medical provision, social security, unemployment benefit, and other forms of social welfare. The report aroused huge public interest, and Beveridge himself spoke about it on the BBC the day after publication. Following its publication, post-war reconstruction became a matter of widespread and enduring general interest.[83] In November of 1943, the post of Minister for Reconstruction was created in the War Cabinet with responsibility for post-war reconstruction policy.[84] Among the public, where reconstruction was concerned, an expectation of action, not just talk, was widespread.[85] For many individuals and organisations, the post-war period would be ripe for profound changes in British society, and there was an expectation it would be radically different from the pre-war world.[86]

In keeping with the mood of the times, the British Association held a conference in March 1943 entitled 'Science and the Citizen: the Public Understanding of Science', where issues relating to the post-war world were discussed. The event arose from a proposal by J. G. Crowther for a conference on 'the extension of the public understanding of the benefits of science', made almost a year earlier to the Divisional committee of the Division for the Social and International Relations of Science.[87] Shortly before the conference opened, Crowther summarised the Division's view of the importance of science in the post-war world in *The Times*:

> ...as we live in a scientific and technical age, science must become a more important factor in general education, as one of the foundations of culture,

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82 WAC R51/523/3, memo from Pringle to Director of Talks, 27 January 1943.

83 Briggs (1970), p.548, 552

84 *The Times* (1943), p.4.

85 Briggs (1970), p. 553.

86 Rose and Rose (1969), p.73.

87 University of East Anglia, Zuckerman Archive SZ/TQ/2/6. Minutes of Divisional Committee for Social and International Relations of Science meeting, 14 April 1942.

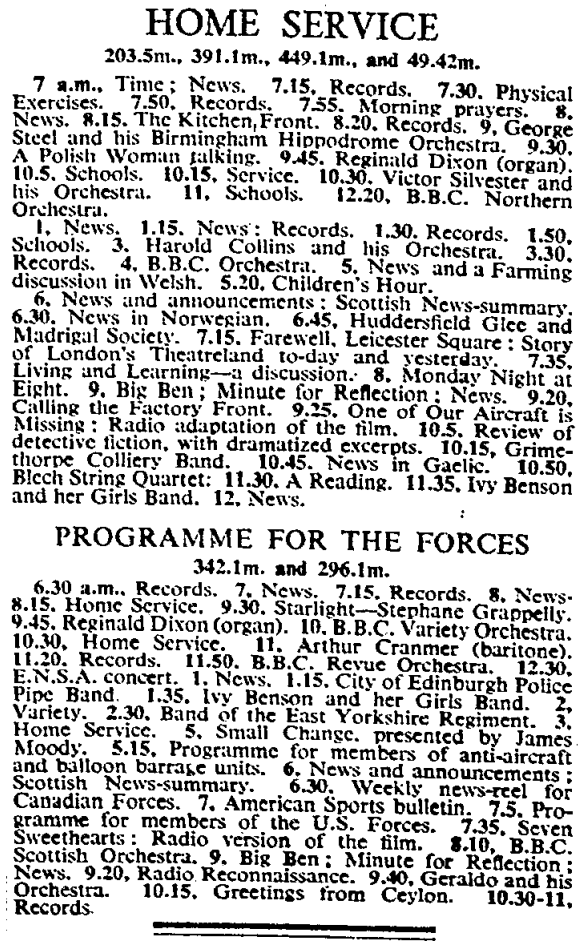
> and in the daily life of the community. We could not win the war without science, and we could not reconstruct a respectable world without it.[88]

Crowther here is arguing not only for the importance of science in 'general education', but also, implicitly, for the importance of scientists in the post-war world. As shown earlier, scientists had achieved a measure of advisory influence with government shortly after the outbreak of war, and could be said to have had a 'good war' in terms of the privileges and influence they had won for themselves.[89] Maintaining the gains in standing of scientists at official level in the post-war world was of material interest. The same news item in *The Times* reported Crowther's interest in radio and other media for promoting scientific knowledge among the public.[90]

[88] Crowther (1943a), p.2.

[89] 'In the Second World War British science had a 'good war'. Scientists were defending both their countries and science itself. [...] [B]y the end of the war, the importance of scientists in waging the war was firmly established as never before.' Edgerton (1990), p.938 and 941.

[90] Crowther (1943a), p.2.



HOME SERVICE

203.5m., 391.1m., 449.1m., and 49.42m.

7 a.m., Time; News. 7.15, Records. 7.30, Physical Exercises. 7.50, Records. 7.55, Morning prayers. 8, News. 8.15, The Kitchen Front. 8.20, Records. 9, George Steel and his Birmingham Hippodrome Orchestra. 9.30, A Polish Woman talking. 9.45, Reginald Dixon (organ). 10.5, Schools. 10.15, Service. 10.30, Victor Silvester and his Orchestra. 11, Schools. 12.20, B.B.C. Northern Orchestra.

1, News. 1.15, News: Records. 1.30, Records. 1.50, Schools. 3, Harold Collins and his Orchestra. 3.30, Records. 4, B.B.C. Orchestra. 5, News and a Farming discussion in Welsh. 5.20, Children's Hour.

6, News and announcements: Scottish News-summary. 6.30, News in Norwegian. 6.45, Huddersfield Glee and Madrigal Society. 7.15, Farewell, Leicester Square: Story of London's Theatreland to-day and yesterday. 7.35, Living and Learning—a discussion. 8, Monday Night at Eight. 9, Big Ben; Minute for Reflection; News. 9.20, Calling the Factory Front. 9.25, One of Our Aircraft is Missing: Radio adaptation of the film. 10.5, Review of detective fiction, with dramatized excerpts. 10.15, Grimethorpe Colliery Band. 10.45, News in Gaelic. 10.50, Blech String Quartet: 11.30, A Reading. 11.35, Ivy Benson and her Girls Band. 12, News.

PROGRAMME FOR THE FORCES

342.1m. and 296.1m.

6.30 a.m., Records. 7, News. 7.15, Records. 8, News. 8.15, Home Service. 9.30, Starlight—Stephane Grappelly. 9.45, Reginald Dixon (organ). 10, B.B.C. Variety Orchestra. 10.30, Home Service. 11, Arthur Cranmer (baritone). 11.20, Records. 11.50, B.B.C. Revue Orchestra. 12.30, E.N.S.A. concert. 1, News. 1.15, City of Edinburgh Police Pipe Band. 1.35, Ivy Benson and her Girls Band. 2, Variety. 2.30, Band of the East Yorkshire Regiment. 3, Home Service. 5, Small Change, presented by James Moody. 5.15, Programme for members of anti-aircraft and balloon barrage units. 6, News and announcements; Scottish News-summary. 6.30, Weekly news-reel for Canadian Forces. 7, American Sports bulletin. 7.5, Programme for members of the U.S. Forces. 7.35, Seven Sweethearts: Radio version of the film. 8.10, B.B.C. Scottish Orchestra. 9, Big Ben; Minute for Reflection; News. 9.20, Radio Reconnaissance. 9.40, Geraldo and his Orchestra. 10.15, Greetings from Ceylon. 10.30-11, Records.

Figure 4.4 Broadcasting schedule for Monday 22 March 1943, from *The Times*, p. 8, at around the time of the British Association's conference 'Science and the Citizen: the Public Understanding of Science'.

The pre-war 'National' and 'Regional' service has been replaced by 'Home' and 'Forces' services. The Home Service inherited from the pre-war arrangement the regional contributions. Although London supplied much of its content, the regions also contributed, and from time to time opted out to broadcast local material to their regions alone. Overseas broadcasting (on short wave) was not listed in UK publications

The ‘Science and the Citizen’ conference was held at the Royal Institution on the weekend of 20–21 March 1943. There were four conference themes. Each theme had a chairman and a number of speakers. Table 1 shows the themes and speakers.

Table 4.1 Themes and speakers at the 1943 conference ‘Science and the citizen’

The Exposition of science	Sir Henry Dale (chair), Lawrence Bragg, Allan Ferguson, Arnold Raestad, Joseph Lauwerys
Radio and cinema	Sir Allan Powell (chair), Robert Watson Watt, G. Ivan Smith, Dr C. D. Darlington, Douglas McClean, Mary Field, Paul Rotha
Science as a Humanity	John L. Myres (chair), B. Farrington, F. R. G. Duckworth, R. V. Southwell, W. E. le Gros Clark, W. E. Williams, C. H. Waddington, N. F. Sheppard
Science and the Press	Sir Richard Gregory (chair), Henry Martin, Francis Williams, Dr D. S. Evans, Ritchie Calder, J. G. Crowther,

The opening address of the ‘Exposition of Science’ session was given by pharmacologist Henry Dale. He said that in the new world, science would have to become the central subject at all stages of education:

> I feel that it is time for us to say, boldly and clearly, that tinkering and patching are not enough, and that to enable this country to play its part in the civilisation now in the making, and to keep step in the march of progress with the other great world communities, nothing will suffice short of such a recasting of our schemes of education as will give to science its proper and central place at every stage – in elementary, secondary, university and adult education.[91]

One of the ways of achieving a proper standing for science was through the public understanding of science. This inspired Dale to a metaphor pre-echoing Dornan’s ‘dominant model’ of science communication:[92]

> the public understanding of science will need for its achievement [...] an efficiency of the transmitter and a tuning of the receivers.[93]

Successful communication was a matter of minimising ‘noise’ – that is, external interference. The nature of the message being transmitted was not in question.

Introducing the conference session on Radio and Cinema, Allan Powell, Chairman of the Board of Governors of the BBC, reported that the BBC had conducted much

[91] Dale (1943), p. 285–6.

[92] Dornan (1990)

[93] Dale (1943), p.285

research into the acoustics of studios and concert halls, that television would increase in importance, that the difficulties of short-wave reception made some types of broadcasting inadvisable. However, as when the BBC's J. C. Stobart addressed the British Association in 1928 (Chapter 3), little was said about science or science broadcasting. Most of Powell's science-related observations concerned in one way or another the technology of broadcasting, and the improvements that could be expected in broadcast sound quality after the war. As for broadcasting about science, Powell confined himself to a few reflections on earlier broadcasts and mentioned a few forthcoming ones:

> In its own actual broadcasts both to home and overseas listeners the BBC has played its part in close co-operation with the learned societies and outstanding scientists in bringing home scientific truths to the listener in popular and understandable language. Noteworthy results were seen in the series of talks on the biological sciences, 'Man's Place in Nature' and 'Reshaping Man's heritage'. Later series of talks will, it is hoped, deal with the physical sciences and with engineering. A large proportion of the spontaneous comments paid tribute to the series as a whole, and the audience, if limited at the outset, was faithful and enthusiastic and growing.[94]

Powell did not discuss or allude to the issues raised in Richard Palmer's internal report *Broadcast Science*, mentioned earlier; that is, there was no discussion of how much science the BBC should broadcast, how it should be organised, what sort of audience it was aimed at, and what its purpose was.

The next speaker was BBC producer G. Ivan Smith. He outlined the professional role of the producer, which was essentially that of a gatekeeper, or editor: ensuring the material was suitable for the listener, that it was organised sensibly, that the speaker addressed the listener in an appropriate way for the medium. Smith acknowledged the need for scientific advisers, but was clear about the limits of their contribution, and that the broadcaster (that is, BBC staff) must have the final say:

> But they [advisors] have always worked on the understanding that the broadcaster shall have final judgment on selection of speaker and method of production provided facts and emphasis are correct.[95]

The gatekeeping function of the producer is spelled out here in relation to the role of advisors. Final judgement on speakers and production method is squarely within the

[94] Powell (1943), p. 295.

[95] Smith (1943), p. 299

professional jurisdiction of the broadcaster. Facts are within the jurisdiction of scientists.

Smith also acknowledged the importance of science in broadcasting, but for him 'popularisation' of science meant making it more comprehensible or palatable:

> [The BBC] will never be a really good service until you, the scientists, and we, the broadcasters, begin to understand much better the urgent need for popularisation and the ways and means of getting the principles of science over to an untrained audience.[96]

For Smith, then, the scientists and the broadcasters were two distinct professional groups with separate areas of competence, however much they might be engaged in a joint enterprise.

The approach to science broadcasting presented by these two BBC representatives was a 'steady as she goes' approach. There was room for improvement – better techniques of broadcasting, better techniques of presentation, and so on. However, the broadcasters were in charge, and the reasons for broadcasting science, though not articulated clearly anywhere, were within the jurisdiction of the broadcaster.

The next speaker was biologist, Fellow of the Royal Society, and occasional broadcaster C. D. Darlington. In early 1942 he had broadcast on *The Bricks of Life* in the *Science Lifts the Veil* series, mentioned earlier as a project between the BBC and the Science Committee of the British Council. Darlington was far from satisfied with the current broadcasting arrangements. He began by pointing out the importance of science in the modern world, claiming that science was no longer the private preserve of scientists. Nevertheless, there was widespread ignorance of the subject, especially at governmental and administrative levels, which Darlington took to be self-evidently bad:

> Of those who govern us, between 90 and 100 per cent, are ignorant of the method and meaning of science. They have been educated in a pre-scientific age. Our educational system instead of integrating the future with the past has bent all its efforts to their separation, to dividing science from the humanities. That fatal separation is evident in many countries, but in this country is has been carried to the limit.[97]

The remedy was at hand:

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96 Smith (1943), p. 299

97 Darlington (1943), p. 300

> We are fortunate in having an organisation, the B.B.C., which can be used for the furtherance of a national interest.[98]

For Darlington, then, the BBC's duty to promote science was not in question, because science was in the national interest and the BBC could promote the national interest. Certainly as part of the special wartime arrangements, by which the BBC was under the aegis of the Ministry of Information, the BBC did promote the national interest; however it is not clear whether Darlington was referring to the special war-time arrangements or whether he thought that in peace time too public service broadcasting entailed the promotion of the national interest (as opposed to the public interest).

Given that, for Darlington, the role of the BBC in relation to science was clear, the question was whether the BBC was structured properly to promote science:

> Is it [the BBC], however, organised at present in such a way as to understand this crisis and its remedy?[99]

Darlington pointed out that although the bar, the press, banking and public administration were represented on the BBC's Board of Governors, there was no scientist.[100] He considered that there ought to be a science committee in the Association to determine a science policy for broadcasting.[101] Another job for the committee would be 'the co-ordination of overseas and home broadcasts of science.'[102] He cited *Science Lifts the Veil,* in which he had participated,[103] as an instance of excellent science broadcasting let down by poor coordination within the BBC:

> A recent series of broadcasts on science was perhaps the best organised ever given. It was presided over by the late Sir William Bragg. It was broadcast overseas. No one in England heard it. A dozen experts in their

98 Darlington (1943), p. 300

99 Darlington (1943), p. 300

100 Darlington (1943), p. 300. The BBC's Board of Governors has, in general, numbered scientists among its members. Briggs (1979, p. 34) suggests there is at least a case for saying science has been under represented on the BBC's Board, giving a figure (for representatives of Science and Education) of 20% compared with the IBA's 33%. (The IBA did not exist at the time of this 1943 BA conference, of course). Whether the more generous representation of scientists on the IBA has worked to the advantage of science in commercial broadcasting is perhaps open to debate. Briggs gives a figure of 19% for Arts representatives on the BBC's Board of Governors.

101 Darlington (1943), p. 300.

102 Darlington (1943), p. 300.

103 Darlington's contribution to Science Lifts the Veil was entitled 'The Bricks of Life' and broadcast on 26 January 1942 on the Empire Service.

> several fields covering almost the whole range of science had prepared an integrated account of their work. [...] Why should their efforts have been devoted to enlightening only a fraction of their possible audience? Similarly broadcasts have been sent to America of conferences in England which could not be heard in England.[104]

As mentioned earlier, the series was not re-broadcast for domestic listeners because the presentation of many of the talks was judged poor by the Director of Talks.

Darlington's talk was followed by a presentation from Douglas McClean, of the Association of Scientific Workers, in which he presented the views of the Association's committee. McClean advocated a scientific approach to problem-solving in the post-war world 'to avoid mistakes in social planning.' This entailed 'a widespread education in the scientific method of attack on any problem.'[105] Among the ways in which the public could be educated in science was through a scientific view of contemporary events:

> One way of inculcating the scientific approach would be to have a scientific worker as a regular commentator on passing events. This would show what events were significant as seen by a scientist;[106]

McClean's view of science was an extensive one. The methods of science could create a better society:

> In particular, appreciation of the methods of rational examination would help the public to assess the claims of politicians, advertisers and quacks at their proper value.[107]

Radio discussions would benefit from the adoption of a more scientific approach:

> ... several speakers [in a radio discussion] would be asked to contribute what they knew as facts about a given problem; they would discuss, if necessary what further information should be sought and how this might be acquired; and, to conclude the colloquium, one of them might sum up the trend of evidence on the facts as known. Thus the scientific approach would be illustrated in discussing a topic of general interest, which should

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104 Darlington (1943), p. 300.

105 McClean (1943), p.301

106 McClean (1943), p.301

107 McClean (1943), p.302

> be related to the everyday life of the citizen and not necessarily a technical, scientific one.[108]

The BBC's monopoly made it especially suitable for educating the public in science:

> We think that the B.B.C., because of its unique and central position and its all-pervasive influence, could bear a great responsibility in achieving these ends.[109]

McClean took a subject's intrinsic importance as an index of the amount of broadcasting time that ought to be devoted to it (a point also made by Darlington):

> ... we submit that the time devoted to science in the home programmes still fails to reflect the reality of the place which science occupies in the life of our times or the need for its wider and more conscious application in the solution of many human problems.[110]

McClean's proposals required the scientific profession to be given a measure of control over broadcasting:

> There should be a permanent committee of representatives of the scientific profession to advise on and to develop ideas for the B.B.C. programmes. This committee should have a status recognised by the B.B.C., and a Science Programme Officer should be nominated by the latter to work with the committee and to maintain liaison with the B.B.C. programme devisers and organisers.[111]

Thus part of the gatekeeping function of the broadcasting professional would be transferred to scientists. The broadcasting professional is then cast as the more junior partner, to whom is delegated expertise in communication, rather than in programme planning:

> The most skilled programme devisers and producers should be consulted at all stages as the best methods of presentation, and adequate tuition of scientific speakers should be provided.[112]

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[108] McClean (1943), p.302

[109] McClean (1943), p.302

[110] McClean (1943), p.302

[111] McClean (1943), p.303

[112] McClean (1943), p. 303.

Again we see here an assumption about science communication that Dornan later characterised as the 'dominant model': science and scientists, as the source of scientific knowledge, are not problematic, but the communication channel is.

As with Crowther in the 1920s, McClean does not see applied science as separate from pure science. Instead, the application of science demonstrates science's effectiveness, and is continuous with science:

> Too many people, however, are conscious only of [science's] effectiveness as applied to methods of destruction. Yet our present civilisation is undoubtedly formed on and maintained by the great recent developments of science and technology which have been used for creative ends.[113]

Darlington and McClean were the severest critics of the BBC at the conference. It might be tempting, therefore, to view them as untypical. However, subsequent events show that a significant number of influential voices within the Division for the Social and International Relations were broadly in tune with the Darlington–McClean view of broadcasting.

Two particular recommendations by Darlington and McClean at the 1943 British Association conference carried a lot of force with officials of the British Association. These were the ideas of a scientific committee to advise on, or plan, scientific broadcasts, and the idea of a scientific manager or Programme Officer to work with producers of radio programmes. A few months after the conference, in December 1943, a delegation from the British Association, including its President, sought to pursue these ideas with BBC managers. The intervening months between the conference and the arrival of the delegation were not, however, without incident, as I will now show.

4.7 After the 1943 conference

On 5 May 1943, the British embryologist Conrad H. Waddington, one of the speakers at the British Association conference and editor wrote to the Director of Talks, George Barnes, to suggest a regular, topical coverage of science.[114] The proposal was passed around the Talks Department, with the comment that it was a good idea, and that there had been similar attempts before. Two producers, Trevor Blewitt and Vince Alford, worked on the idea, and reported to the Director of Talks.

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[113] McClean (1943), p.301

[114] WAC R51/523/3 letter from Waddington to George Barnes, 5 May 1943. In the same letter Waddington writes: 'I am supposed, if I could find the time, to be editing a *Penguin Science News* appearing about 3 times a year or less during the War ...', however according to the British Library catalogue the first number of Penguin Science News appeared in 1946.

They proposed a series of scientific broadcasts for Forces network, the popular precursor of the Light Programme. What makes their response relevant here is another rare glimpse it provides of BBC production staff setting out their thoughts on the 'why' of science broadcasting, rather than the customary 'how'. Blewitt and Alford considered that this type of broadcast:

> ... would meet a long-felt need in Talks programmes and that the proposal would, provided certain conditions were fulfilled, be practicable. [underlining in original][115]

Institutional memory regarding science broadcasts was sought:

> I also consulted Mary Adams, who has always taken a special interest in the popularisation of science. I should mention, without comment, that she took a fairly pessimistic view with regard to the possibility of conveying scientific information to the uninformed layman in simple terms if violence were not to be done to the accuracy of this information.

Blewitt and Alford shared a conviction with members of the British Association that the war had brought more people into contact with science and technology than ever before, and that these people were a new audience for popular science:

> I have pressed the point for some time in the Department that a very large section of the community is, in this technological age, now 'technically minded' and not 'literary'. The war has, I believe, stimulated research in a great many branches of science, both pure and applied.

Like many members of the British Association, these producers saw the future as a scientific one:

> The amenities and amelioration of life which will come about after the war as a result of the scientific discoveries of the war, the very mechanisation of warfare, the process of rationalisation in industry, will enlarge the numbers of the public receptive to 'Science News' – that is, to news of scientific research in the field of applied science.

As always, BBC staff needed sound advice on subjects and speakers:

> I should like to use in a consultative capacity such scientists as Waddington (who seems, however, to be too busy to devote much time to the matter), Alfred Bacharach, the chemist who maintains contact with

[115]WAC R51/524/4, memo from Trevor Blewitt to Director of Talks, 24 May 1943.

scientists in a great many other fields, Darlington, Sir Harold Hartley, H. Levy, and so on.

These producers appeared not to have known about the arrangement with the secretaries of the Royal Society for this kind of advice.

These extracts and others showed science policy being made 'on the job' by non-specialist producers in the Talks department as they developed a programme idea. Blewitt deliberated over the format of the programme (items lasting from 5 to 7 minutes were suggested, with three or four items per programme), over the scope (medicine, biology, physics and materials are suggested as the principal subject areas to be covered), and so on.[116] The process also indicated how, in the absence of a high-level scientific manager of a science broadcasting department, science broadcasting proceeded in a somewhat *ad hoc* way, based on the producers' own experience, intuitions and professional judgement. Advice was sought from colleagues who had dealt with similar matters and who were respected (for example, Mary Adams). In addition, a pool of outside contacts was referred to for advice, but with no suggestion that responsibility be formally ceded to them.

4.8 The BA delegation to the BBC, December 1943

Eight months after the 1943 BA conference 'Science and the Citizen: the Public Understanding of Science' discussed above, the Director General[117] of the BBC, Robert Foot, received a letter from Richard Gregory, President of the British Association. The first part of the letter observed that there had been a recent increase in the general level of interest in science among the public, and asked whether the BBC's Listener Research Department could supply the Association with information regarding the public's attitude to science broadcasts.[118]

The next part of the letter raised the matter of the post-war world, and its assumed realignment towards science. This would call for an enhancement of the public's understanding of science, which would entail collaboration by the British Association with other agencies, including the BBC. The Association's preparations for post-war conditions included a by-now familiar recommendation to the BBC about its science coverage, which Gregory set out in his letter:

[116] WAC R51/524/4, memo 24 May 1943

[117] Robert Foot had been appointed in 1942 as one of two joint Directors General, the other being Cecil Graves. Foot and Graves replaced Frederick Ogilvie, who had succeeded John Reith in 1938. Graves, who was an internal appointment, retired in September 1943 owing to ill health. Following Graves's retirement, Foot, who was an external appointment, continued as sole Director General for a year, being replaced in 1944 by William Haley. Haley remained in post until 1952.

[118] WAC R51/529, letter 19 November 1943. The BBC's Listener Research Data was not at this time made public (Silvey1974, pp. 34–5).

(1) that a standing committee of representatives of science should be created to put forward ideas and plans for science in broadcast programmes,

(2) that a science programme officer should be appointed to co-operate with the committee and with those responsible for the arrangement and organisation of programmes.

These recommendations had significant implications for the BBC. The first gave outside scientists much more than an advisory role. The proposed standing committee would take over some of the roles of producers and planners within the BBC. The second recommendation hinted at the centralisation of science under a single manager – a proposal dating back to J. G. Crowther's letter to the BBC in 1926.

W. J. Haley, a senior manager in the BBC, and shortly to be Director General, pencilled a couple of comments to these proposals:

Proposal 1 would depend on the limitations placed on such a committee and our freedom to deal with the Samuel Butlers of tomorrow.

Proposal 2 would be most dangerous.[119]

In Haley's response to the first proposal, the phrase 'The Samuel Butlers of tomorrow' is enigmatic, not least because English literature boasts two Samuel Butlers. The earlier Butler (1613–80) wrote *Hudibras*; the later Butler (1835–1902) wrote *Erewhon* and *The Way of All Flesh*. A possible interpretation of Haley's response relates to the later Butler's penchant for pronouncing controversially on subjects outside his expertise, notably the evolution of animals.[120] The BBC's managers, as we have seen, were nervous about scientists straying into politics and social policy, to say nothing of broadcasting policy. Chapter 3 also showed that John Reith had been nervous about factions within an external body gaining access to broadcasting and claiming to speak for all. As for the second proposal in Gregory's letter, it would give outsiders a considerable role in the devising of programmes.

[119]WAC R51/529, memo 24 November 1943.

[120]I am indebted to Dr Sara Haslam of the Literature Department of the Open University Arts Faculty for this interpretation. Another interpretation might relate to Butler's tendency towards provocative reversals of conventional wisdom, as for example in his literary study *The Authoress of the Odyssey* (1897) (Shaffer 2004). William Haley appears to have been find of citing the later Samuel Butler. Kenneth Adam, a BBC employee, recollected: 'My former chief, Sir William Haley, used, when Director General of the BBC, to comfort himself, and us, with Samuel Butler: "If an art is to weather well, it must be prepared to be treated savagely."' (Adam, 1965, p.77)

A meeting was arranged for 14 December 1943 between representatives of the British Association and representatives of the BBC. Possibly in connection with this meeting, a list of scientific broadcasts from 1943 was compiled, although there is no record of it having been presented at the meeting. Appendix 1 is taken from that list.[121] A striking feature of the list in Appendix 1 is the number of science items in 'magazine' style programmes and in 'flexible' slots dedicated to miscellaneous topics. Examples were *Ariel in Wartime*, *The World Goes By*, *Tonight's Talk*, *Close Up*, *Everybody's Scrapbook* and *Strange to Relate*. In addition to these, science was included in broadly framed series which could encompass scientific and non-scientific content. The prime examples here were *Men Behind Victory* and *British Craftsmen*. Finally, there were broadcasts that declared their scientific content explicitly: *Pathfinders of Science*, *The Solar System* and *Science at Your Service*. Science thus merged seamlessly into the mixed fare of general interest broadcasting.

On the day of the joint BA/BBC meeting, and before the meeting took place, a short news item appeared in the *Evening Standard.* Its tone was confrontational:

> The deputation had its genesis in a conference last March, convened by the British Association, on Science and the Citizen. At one session Sir Allan Powell, President of the BBC [sic, he was actually Chairman of the BBC] heard from the chair ideas on broadcasting and the citizen; in particular suggestions that the BBC should have a scientific advisory committee, with a man of high standing as a permanent official of the BBC to look after the scientific broadcasts. This afternoon, in effect, Sir Allan Powell is being asked 'What about it?'[122]

The BBC representatives at the meeting, disquieted by the press announcement, looked to the British Association deputation for an explanation of how news of the meeting could have been leaked, but none could be given.[123]

The nine-strong deputation from the British Association was headed by Sir Richard Gregory and included Julian Huxley and science populariser Ritchie Calder. The following account is based on notes made by BBC staff.

Gregory opened the meeting by saying that the visit was prompted by 'certain remarks by the BBC Chairman' at the conference held in March of that year (described above). Gregory then repeated the two proposals that had been made in

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[121] The list appears as an undated document in WAC R51/529, which contains most of the documents relating to the BA delegation of 1943.

[122] Anon (1943)

[123] WAC R51/529 Notes of meeting at Broadcasting House, 14 December 1943.

his letter to the Director General. Each member of the British Association delegation then made a few points.

Julian Huxley reiterated the importance of science to material and social progress. He said that all the delegation regarded the time devoted to science on the BBC as inadequate. Regarding an advisory committee, he said that the Association could supply names of suitable people.

Concerning the proposed Science Programme Officer:

> The delegation] wanted to see a man of high scientific attainments, e.g. a man of University professorial status appointed as the proposed science programme organiser.[124]

Other points made by delegates were rather diffuse. Ritchie Calder mentioned his scientific writings for the *Daily Herald*, and reiterated that there was a new, young audience for science as a consequence of the war. Douglas McClean, who had spoken at the British Association's 'Science and the Citizen' conference a few months earlier, praised the science broadcasts on the Overseas Service and suggested that the Home Service should take advantage of them. He also suggested that there should be a weekly science commentary following a news programme.

The Director General began his responses by saying that the BBC understood the importance of using broadcasting effectively for disseminating scientific knowledge. He then made what turned out to be a characteristic move of BBC managers: to point out what the BBC was already doing for science. On this occasion he drew attention to the BBC's pre-war and current arrangements for scientific advice:

> The pre-war arrangement of the General Advisory Council and the Talks Advisory Council was no longer operating and meanwhile there was the temporary arrangement with the Royal Society, under which their Joint Secretaries acted as advisers[125]

It was made clear to the delegation that the idea of a Scientific Advisor was one which the BBC was unlikely to contemplate in war time.[126]

The British Association appears to have been perturbed at hearing of the secret advisory arrangement between the BBC and the Secretaries of the Royal Society.

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[124] WAC R51/524/4, memo 14 December 1943.

[125] WAC R51/524/4, memo 14 December 1943.

[126] WAC R51/529 Memo 6 Jan 1944 from Director of Talks (George Barnes) to Assistant Appointments Officer.

After the meeting, as a possible appeasement to the British Association, a suggestion was floated that 'one or two of [the British Association's] members should be consulted in addition to the Royal Society secretaries.' [127] However, the formal arrangement was not changed, and producers had always had latitude to go to sources outside the Royal Society if they wished.[128] The confusing ambiguity of this arrangement had repercussions later.

The Director General offered to consult the British Association on 'the post war plan for an effective advisory body.'[129] However, the post-war shape of the BBC was not at all clear in 1943, even at Director General level. The Charter was due to expire in 1946, and it was generally felt that post-war programming would be different from pre-war. Privately, in an internal memo, the Director of Talks, George Barnes, considered that if it came to a choice between a scientific advisory committee and a single scientific planning officer, the Corporation would be more likely to go for an advisory committee.[130] No reason is given, but there was plenty of precedent within the BBC for advisory committees. The proposed consultation with the British Association about post-war advisory arrangements appears not to have taken place.

Closing the meeting, the Director General expressed:

> his great interest in what had been said by the various speakers and said that all the suggestions put forward would receive full and sympathetic consideration. The scientists on their side expressed satisfaction with the way in which their suggestions had been received and with the meeting generally. [131]

A non-committal press release was issued, and that was the end of official discussions between the BBC and the British Association on this matter until after the war.[132] There were, however, further delegations from two members of the Association of Scientific Workers.

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127 WAC R51/529, memo 22 December 1943 from Sir Richard Maconachie to Director General.

128 WAC R51/529, memo from Clerk to the Board to C(N) 10 Jan 1944; and memo from Sir Richard Maconachie to Director General, 22.12.1943.

129 WAC R51/524/4, memo 14 December 1943

130 WAC R51/529 Memo 6 Jan 1944 from Director of Talks (George Barnes) to Assistant Appointments Officer.

131 WAC R51/524/4, memo 14 December 1943.

132 McGucken (1984, p.145) reports that Gregory's delegation was 'sympathetically received by the Director General and members of his staff, with whom they had a full discussion on future arrangements for broadcasts on scientific subjects and the best means for securing such arrangements.' However, this is inconsistent with the documents cited here, which show that the Association's proposals were viewed with great disquiet within the BBC, particularly the idea of a high-level scientific manager.

4.9 Association of Scientific Workers' delegation, February 1944

Early in February 1944, W. J. Haley of the BBC received a letter from Douglas McClean on behalf of the Association of Scientific Workers. McClean's letter requested an interview in order to discuss the broadcasting of science.[133]. (McClean was also a member of the British Association, and had spoken at the conference on the Public Understanding of Science in March 1943.)

A meeting was set up, and research conducted by the BBC into the standing of the Association of Scientific Workers. This found that it represented lower rather than higher echelons of scientific work, and was 'politically biased'.

> The Association is a very active body with a somewhat political bias. It is recently formed and is, I gather, a kind of Trade Union of scientific workers – technicians in science, that is the men who assist in research, not the professors.[134]

The status of the Association was thus established, and its place in a the hierarchy of scientific organisations clear. It represented technicians, who assisted in research, whereas the British Association popularised research, and the Royal Society's members actually conducted research.[135] BBC management was thus particular about positional matters.

The meeting took place on 12 February 1944. The Association of Scientific Workers' main proposal was: 'that the BBC should appoint a full-time scientific officer who would be assisted by some sort of outside scientific advisory body'.[136] This was much the same as the pair of proposals made a few months earlier by the British Association's delegation.

Haley's report of the discussion shows that, from his point of view, the crucial question was whether these suggestions were designed to enhance the public's appreciation of science or whether they were designed to re-shape society's mental processes:

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[133]WAC R51/529, letter 4 February 1944.

[134]WAC R51/529, memo 10 February 1944. This characterisation of the association is not entirely accurate. The Association of Scientific Workers was something between a trade union and a professional association. It began as the National Union of Scientific Workers, founded in 1918, which grew during the 1920s but did not affiliate either to the TUC or the Labour party. It almost collapsed with the economic slump of the 1920s. Following the General Strike, it de-registered as a trade union and re-launched itself as the Association of Scientific Workers, in which form (after some reversals) it proved attractive to academic scientists (Werskey, 1978, pp. 39–40).

[135] WAC R51/529. Notes of meeting at Broadcasting House, 14 December 1943.

[136]WAC R51/529, memo 12 February 1944.

> In reply to questions by [Haley], they did not appear to be quite clear exactly what would be the goal to be achieved by the broadcasting which could be done under such auspices, whether it would merely be the popularisation of science, or the adoption by the public over a period of years of a scientific attitude of mind. They favoured the latter.[137]

Haley did not say what his attitude to either of these objectives was. His view was pragmatic:

> [Haley] pointed out that the first necessity to any broadcasting about science was a decision as to the amount of time that should be allotted to it. [138]

The interchange shows the different approaches of the two sides. The proposal made by the Association of Scientific Workers was essentially about giving the scientific profession a degree of influence over the BBC's science output. Haley's response was not to tackle this proposal head on, but to ask what it meant for the listener, and for the broadcaster, who had to determine an appropriate amount of time for science. In effect, Haley reframed the issue in terms of the broadcasters' areas of concern, thereby asserting the centrality of the broadcasting professional and yielding nothing to the scientists. The meeting ended with no commitments from either side.

At the time of the events described above phonetician, speech-therapist, musician and barrister Sir Richard Paget produced a British Association memorandum outlining what a more science-oriented programming policy might look like in practice. [139] There is no indication that his suggestion represented anyone's thoughts but his own. Paget's memorandum began by pointing out that listeners must be made aware of their duty to inform themselves on scientific matters:

> Listeners should be reminded that the future welfare of the British Commonwealth, and, indeed, of the world as a whole, will largely depend on <u>how much</u> we are able to understand and use scientific knowledge and scientific methods. We must, therefore, be prepared to give more of our listening time to science.

[137]WAC R51/529, memo 12 February 1944.

[138]WAC R51/529, memo 12 February 1944.

[139]WAC R51/529, British Association Memorandum F140, 'BBC Talks on Science'. Paget had a theory that if one jumped off a bus when it was travelling fast enough, the air pressure would hold one upright during landing. His daughter Pamela (later Lady Glenconner) confirmed the theory by throwing herself off a bus travelling at 30 m.p.h. down Park Lane. (Massingberd, 1995, p. 132).

Once again there was the idea here that the economic importance of science placed a duty on the public to take a greater interest in science. Also, the application of science was not regarded as separate from 'pure' science.

Paget then gave an analysis of the BBC's broadcasting output on the Home Service for the week 5–11 December 1943. The total broadcasting time was stated to be about 121 hours, of which about 1 hour was devoted to science. (Paget said a further 40 minutes was devoted to science in the Schools broadcasts.) It is not clear whether Paget took account of the science topics included in 'general interest' programmes, of the kind shown in Appendix 1, or whether he confined his reckoning to broadcasts that had explicitly scientific titles.

According to Paget, the big scorers, in terms of air time, were serious music (26 hours), news (almost 17 hours), Schools (12 hours), readings and talks (11 hours), popular music (7½ hours), variety (7 hours), music for factory workers (7 hours) and religion (6 hours). Paget found the time devoted to science inadequate:

> in view of the high importance of encouraging scientific method – especially in the rising generation and the forces - a larger proportion of the BBC time should be given to science.

He proposed that just over four hours per week be devoted to science – an increase of three hours, and approximately one hour less than was devoted to *Children's Hour*. The weekly four hours of science would consist of two 30 minute talks, plus two 10-minute sessions of answers to listeners' questions in each of three areas – history of science, pure science and applied science.

Most of the extra time for science in Paget's scheme was to be taken from music. On Paget's figures, music of all kinds occupied 43% of the Home Service's broadcast time. Paget proposed taking 1¼ hours from serious music, ½ hour from popular music, 1 hour from readings and talks, and ½ hour from variety. Paget ends his memorandum with a plea for more science on the Forces network, whose audience was by no means only service personnel at this time.

Paget thus saw the amount of time devoted to science (relative to other subjects) as reflecting a judgement about the importance of science. The lack of time devoted to science (in Paget's) view was a sign that the significance of science was not grasped within the BBC. His approach, as shown above, was to stress how important science was to the functioning of the Commonwealth and the world, and to extrapolate from that to a commensurate amount of specifically scientific output. The conversion rate from importance to time remained, however, a matter of personal judgement. Paget

offered no reason for why his fours per week devoted to science would be more appropriate, than, say, five hours, or more. Paget's proposal to reserve time for specifically scientific material suggests he was not sympathetic to, or possibly unaware of, the prevailing practice of embedding science in general-interest programming.

4.10 Science magazine

In 1944, with allied victory in the second world war looking likely, the BBC revisited the idea of a regular science programme, but with a slant towards science as an analytic method, rather than a body of knowledge:

> The falling away with the end of hostilities of the various programmes dealing with war will release the mental powers of a wide section of the population who though not trained for concentrated listening approach radio with a keen sense of its informational value, if the information be easily digestible. The idea of the programme suggested is therefore not so much to pass solid factual knowledge to the listener as to stimulate his interest in science and develop his understanding for the scientific method and attitude generally. It should be a weekly series and the best length for it would be 45 mins.[140]

This proposal emerged, rather unusually, from the Features department (whose output consisted of drama and dramatisations), rather than from Talks. It was prompted by a report from the Listener Research department that identified a popular audience for science. The Director General lent his support to the proposal.[141]

Lawrence Gilliam, Assistant Director of Features, took up the idea, which was eventually refined into a fortnightly or monthly broadcast of 30 minutes on Sunday evenings, intended both for domestic and overseas listeners.[142] Gilliam tried to set up a scientific committee to advise the programme makers. A. V. Hill, one of the secretaries of the Royal Society and therefore one of the official scientific advisers to the BBC, declined to be on the committee, but suggested suitable candidates, including P. M. S. Blackett, J. D. Bernal, Solly Zuckerman, C. D. Darlington, Louis Rapkine and C. H. Waddington. Hill also recommended that advisers be paid a fee, and suggested 10guineas.[143]

[140]WAC R51/523/4, undated memo from F. Goldman, of the Listener Research department.

[141]WAC R51/523/4 memo 1 September 1944.

[142]WAC R51/523/4, memos 21 and 27 November 1944.

[143]WAC R51/523/4, memos 22 and 24 January 1945.

As a member of the Features department, Gilliam appears to have been unaware of the delicacy of the issue of outsiders advising the BBC on science. In trying to create a scientific advisory committee for *Science Magazine*, Gilliam was walking into a minefield – one that extended beyond the BBC. In a Parliamentary Question directed at the Minister of Information on October 1944, around the time the new programme idea was being developed, Sir Ernest. Graham-Little[144] had wanted to know:

> ... what arrangements are made by the BBC to take expert advice in the arrangement of their broadcasts relating to all branches of science; what is the membership of the Corporation's scientific advisory committee; and, if such a committee is not in existence, whether he will recommend the governors that such a body should be appointed in the near future.[145]

The written answer said next to nothing about future arrangements:

> The BBC has no Scientific Advisory Committee. Its present practice is to seek advice on scientific subjects from the Royal Society, the British Association, the Medical Research Council, and other authoritative sources according to need. This procedure will be reviewed in due course in relation to the BBC's post-war arrangements for advisory committees generally.[146]

A few months later, the Director General received a letter from Robert H. Pickard, of the Joint Council of Professional Scientists, who invoked the existence of an advisory body on religion as a precedent for one on science:[147]

> I am directed to ask you to inform the Governors of the BBC that the attention of my Council has been drawn to the desirability of the formation of a committee of scientists to advise the Corporation, along the lines of the existing Advisory Committee on religion. My Council has noted the reply of the Minister of Information to a recent question in the House on the subject. It regards the establishment of such a committee as one of great importance so as to ensure an adequate covering of the whole field of science and its applications. [148]

[144] Besides being an MP, Sir Ernest Graham-Little was a physician with an interest in dermatology, and from 1906 to 1950 served on the senate of the University of London.

[145] Graham-Little (1944)

[146] Bracken (1944)

[147] The Joint Council of Professional Scientists was a joint body of the Royal Institute of Chemistry and the Institute of Physics, set up in 1942 for the duration of the national emergency.

[148] WAC R6/288, memo 8 February 1945.

The Director General's reply reiterated the Minister's reply: the question of Advisory Councils would be reviewed in due course along with other plans for post-war reorganisation.

News that the *Science Magazine* programme was intending to have a paid advisory science committee filtered up to higher-management levels of the BBC, and precipitated an outburst. The Senior Controller, B. E. Nicholls, expressed his irritation to Acting Controller, Entertainment:

> One would have thought that by now everyone of any standing in the BBC would have realised that Advisory Committees are regarded as the prerogative of the DG [Director General] and that no member of staff, not even the Head of a Department, let alone a producer, has any right to go about the place asking people whether they would like to serve on an Advisory Committee or whether they think it would be a good idea for the BBC to have one. It might even have been realised that our Advisory Committees are honorary and the precedent of paying members 10 gns a meeting is not to be lightly undertaken.[149]

Nicholls acknowledged that the Science Magazine advisory committee was a different animal from the usual Advisory Councils, but was worried by the precedent it could set:

> I realise, of course, that the ultimate proposal that has got past you is for obtaining 'the advice of a representative panel [...] at this particular moment', and this may be a reasonably temporary proposal, but nevertheless it is terrifying to think that we can have producers discussing with 'Sir Henry Dale (President of the Royal Society) downwards' the need for the BBC to have a Scientific Advisory Committee.[150]

Yet again the extraordinarily sensitive nature of 'advisors' to the BBC is shown, and an extreme concern over arrangements being established through discussion with outside individuals and bodies. Also illustrated is the autonomy production staff enjoyed, by which they could proceed with a new idea without realising a regulation had been contravened, albeit a regulation that was confusing and subtle.

The request to authorise Science Magazine's advisory committee went as high as the Director General. Concern about an *ad hoc* advisory group representing an external faction was explicitly stated:

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[149] WAC R6/288, memo 15 August 1945.

[150] WAC R6/288, memo 15 August 1945.

> I have consulted the DG about the representative panel proposed by D.F. [Director of Features] and I am afraid that he cannot agree to it. An *ad hoc* panel of this nature might be useful but obviously it would tend to become a vested interest and we should find ourselves with a scientific advisory committee before we knew where we were.
>
> The present ruling is that we obtain general advice from the Secretaries of the Royal Society and the staff of the British Association, and advice in detail from consultants who are expert in the particular branch of science.[151]

Science Magazine had a short life from 5 August 1945 to the end of the year.[152]

This episode indicates the seriousness with which BBC managers took the question of advisory committees, in general, and a scientific advisory committee in particular. Underlying the issue for the BBC managers loom anxieties about manipulation of the BBC by 'a vested interest', and a concern that an apparently loose, *ad hoc* arrangement created for one programme could be cemented and become a general scientific advisory committee by default. As mentioned in Chapter 1, in Mary Douglas's work on institutional behaviour, organisations with a strong group ethos and high levels of autonomy among their members ('low grid') are often characterised by anxiety about the organization's boundary, and a tendency to demonize members who have transgressed. The episode of Gilliam's advisory group fits closely Douglas's analysis.

As far as scientific interventions are concerned, there were no further significant interventions until the late 1940s. However, immediate post-war events had implications for the BBC's handling of science, and I shall examine these in the early part of the next chapter.

Summary of Chapter 4

The second world war saw scientists gaining a measure of influence at government level. This period also saw several attempts by, principally, the representatives of the British Association and the Association of Scientific Workers, to restructure the organisation of science within the BBC. All these attempts were designed to achieve similar objectives: a centralised production unit for science, managed, or at least strongly influenced by, a scientific manager or an advisory body of scientists. Other

[151]WAC R6/288, memo 20 August 1945.

[152]WAC R51/523/4, memo 24 January 1945.

attempts at influencing BBC science broadcasting came from the Science Committee of the British Council.

The case advanced by scientists for changes at the BBC related to the intrinsic importance of science in modern life and to the importance of rational thinking in everyday life. Scientists were also, from about 1943 onwards, manoeuvring to secure the place of science and scientists in the post-war world, as discussions turned towards post-war reconstruction.

All attempts by external bodies to influence science production were resisted by the BBC. Unofficial advice, and particularly *ad hoc* advisory groups, were seen to present a danger of vested interests using the BBC for their own ends. BBC management drew fine distinctions between 'controlling', 'advising' and 'informing'. However, the actual practice of producers dealing with outside experts, shows these distinctions to have been unclear.

Certain key individuals operated in multiple social worlds. Julian Huxley, already mentioned in Chapter 3, was a frequent broadcaster, and also a member of the British Association's delegation to the BBC in 1943. Similarly J. G. Cowther functioned as frequent broadcaster on the Overseas services, as a valued unofficial adviser to producers in the Overseas services, and as a committee member of the British Association.

Institutional memory is seen to have a significant role at the BBC. When a new popular science series was proposed, Mary Adams's advice was sought. When established advisory arrangements were ignored or forgotten, managerial anger followed.

Chapter 5 Post-war to mid-1950s

5.1 Post-war re-structuring at the BBC

The shape of post-war broadcasting was under review in the BBC from as early as 1943.[153] One consideration weighing on the minds of BBC managers was the expiry of the charter, due at the end of December 1946. It was assumed that there would be an inquiry into broadcasting in the UK well before that date, and that its outcome would determine the form of a new charter. Many staff members within the BBC felt that such an inquiry would recommend the ending of BBC's monopoly of broadcasting. Several influential figures in public life argued for this, including Reith's successor Frederick Ogilvie,[154] Director General from 1938 to 1942.

In the event the existing charter was extended by five years to 1951 without an inquiry. The exceptional conditions of war had obtained for so much of the existing charter's life that a fair evaluation of it was not thought possible in 1946. One consequence of the extension was the postponement of the post-war review of the advisory councils. Such a review had been cited by BBC managers in response to criticisms about the absence of a science advisory committee, as was shown in earlier chapters. The delayed inquiry, under Lord Beveridge in 1949/50, turned out to have little to say about subject-specific advisory committees. A more immediate concern as the war drew to a close in Europe was whether to return to the pre-war pattern of National and Regional services, or whether some other configuration would be better.

An influence on the design of post-war BBC services was the great popularity of the Forces service. Audience research had shown it to be popular with both services personnel and civilians. It was listened to by about 60 per cent of the radio audience.[155] A large part of this audience stayed tuned to the Forces service continuously for extended periods, rarely venturing to the Home Service. The radio audience, it appeared, was segmented into groups with distinct tastes.

During 1943, B. E. Nicholls, a senior BBC manager, outlined a scheme for three post-war radio services: a Home service, a 'light' programme similar to the Forces service, and an Arts programme. The Arts programme was to be devoted to 'high quality performances of masterpieces in all the arts amenable to broadcasting'.[156] The

153 Briggs (1970), p. 647.

154 Briggs (1995b), pp. 39–40.

155 Gorham (1952), pp. 199–200.

156 Briggs (1995b), pp. 46–7.

Arts proposal, though not universally welcomed either inside or outside the BBC, gained ground, was re-described as a 'cultural' service, and eventually became the Third Programme, commencing in September 1946. It will be considered shortly.

The three-station plan found favour and by early 1945 the Director General, William Haley, was speaking of it publicly, although the nature of the third service was still undecided.[157] Haley's three-station plan was associated, in his own mind, with a stratification of the audience by culture and education. As he recalled later:

> I have always believed ... that every civilised nation, culturally and educationally, is a pyramid, with a lamentably broad base and a lamentably narrow tip. And ... I devised these three programmes with the idea that we would have a Light Programme which would cover the lower third of the pyramid. We would have a Home Service which would take more than the middle third, take everything up to the tip. And then we'd have a Third Programme. [...] [158]

Haley, in Reithian fashion, saw BBC's role as guiding listeners upwards through this three-layer structure:

> And my conception was of a BBC through the years – many years – which would slowly move listeners from one stratum of this pyramid to the next.[159]

The new third service would cater for the top third of the pyramid.

In addition to the restructuring of radio services, another issue facing BBC managers in the latter part of the war was television, which had been off air during the war, and which before the war had been little more than an experimental service confined to the London area.[160] After the war, television was in effect a new medium in Britain, beset by conflicting views on how it should be developed. Some BBC managers regarded it as an extension of radio; others considered that it should develop separately from radio.[161] A tradition of 'automatic mutual hostility' soon developed

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157 Briggs (1970), p.651.

158 BBC Oral History P, Sir William Haley interviewed by Frank Gillard. Quoted in Carpenter (1996) p.9.

159 BBC Oral History P, Sir William Haley interviewed by Frank Gillard. Quoted in Carpenter (1996) p.9. Robert Silvey, a long-term member of BBC staff who devised audience research at the BBC questioned this type of stratification. On the basis of audience research, he maintained that 'highbrow' listeners were distinguished from others by the fact that they listened to, and appreciated, all kinds of material, not simply the kind their educational and cultural backgrounds were thought to predispose them to. (Silvey, 1974, pp. 124–5)

160 Robson (2004).

161 Briggs (1995b), pp.4–9.

between television and radio which was injurious to the work of practitioners in either medium.[162] From a managerial point of view, television was subordinate to radio for the first few years of its revived existence. Formally this changed in October 1950, when television acquired full departmental status, a Controller, and a seat on the Board of Management.[163]

5.2 Post war broadcasting conferences and science

In October 1945, Vincent Alford, Acting Assistant Director of Talks, spoke about broadcasting at a conference on 'The Publicity of Science', arranged by the Royal Institute of Chemistry. In 1943 he and Trevor Blewitt had tried to start a series of science news programmes for the Forces service (see Chapter 4). Alford had commented in 1943 that he expected that in the post-war period there would be a good deal of popular interest in news about applied science.[164] In 1945 he advocated an extensive conception of scientific knowledge as a safeguard against deception:

> The appreciation of scientific principles by this large untrained section of the community is, in my view, a vital responsibility of all of us here today to safeguard the relatively ignorant against the charlatan, to enable them to distinguish reputable hygiene from, for example, patent medicines, and truth from a daily dose of potted astrology.
>
> In addition to developing such critical faculties as this, you are also, by broadcasting, increasing man's value as a citizen, not only of the nation but of the world.[165]

Whatever the extent of Alford's sympathy for promoting the public understanding of science, though, he was first and foremost a broadcaster, and his overriding concern lay with the listener, and with the broadcaster's role in determining appropriate fare:

> You may exasperatedly fling out the question to us, why can't you stop at any rate some of the jazz and swing and crooning, but the answer is that the human attention can't stomach more than a certain amount of the

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[162] Briggs (1995b), p. 5

[163] Boon (2008), p. 194.

[164] WAC R51/524/4, memo from Trevor Blewitt to Director of Talks, 24 May 1943.

[165] WAC R51/523/4 Vince Alford (1945) 'Broadcasting'. Paper presented at The Publicity of Science conference, organised by the Royal Institute of Chemistry, at the London School of Hygiene and Tropical Medicine', 21 October 1945.

> spoken word and can't digest more than a limited amount of a programme which requires attention.[166]

The broadcaster's skill lay not only in 'balancing', but in knowing whether something being broadcast was intelligible:

> But whether the audience understands what is being said to them is a question that must be decided by the producer. It is in fact what he is there for, what he is trained for:- instinctively to understand the limitations of the audience of non-experts whom the expert is addressing.[167]

By invoking the rather mysterious ability to know what the audience could and could not grasp, Alford asserted the professional authority of the broadcaster. Broadcasting practitioners were uniquely endowed with this skill, and its subtle and elusive character lent it the mystique associated with professional activity.

In 1946, Mary Adams's successor Ian Cox was briefly back at the BBC following wartime naval service, and contributed more thoughts on radio science at a conference in Cambridge. Gone was Cox's pre-war classification of science into evolutionary stages as a framework for broadcasting. The emphasis now was much more on the professional skills required of a producer, which were those of arranging suitable topics and speakers, and guiding speakers in the presentation styles required for broadcasting:

> ...it is the function of the producer to ensure that the material is presented to the listener in the most acceptable or desirable form, having regard to the individual characteristics of the speaker and to the requirements of direct communication to the ear.[168]

Cox acknowledged the need for advice from the scientific world:

> If the highest standard of advice and the active cooperation of the men of science is not forthcoming ... then the way is open to error, false emphasis and broadcasts by charlatans ...[169]

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[166] WAC R51/523/4 Vince Alford (1945) 'Broadcasting'. Paper presented at The Publicity of Science conference, organised by the Royal Institute of Chemistry, at the London School of Hygiene and Tropical Medicine', 21 October 1945.

[167] WAC R51/529, Ian Cox, 'Science and the Spoken Word', presented at the Science and Radio conference, Cambridge, 18–19 May 1946.

[168] WAC R51/529, Ian Cox, 'Science and the Spoken Word', presented at the Science and Radio conference, Cambridge, 18–19 May 1946.

[169] WAC R51/529, Ian Cox, 'Science and the Spoken Word', presented at the Science and Radio conference, Cambridge, 18–19 May 1946.

However, he was clear that BBC staff were ultimately in charge of the broadcasts. He made this point at yet another conference in 1946:

> [The Talks producer] is the specialist who advises speakers as to the most desirable form for the presentation of their material, both from the point of view of their own vocal capabilities and from the point of view of the listener who has to rely on his ears alone and cannot 're-read'. The Producer is also responsible for recommending, assembling and collecting material for inclusion in the programmes.[170]

The pre-war comments of Adams, and the later comments of Cox, reveal a sense of the broadcasting professional's view of science; that is to say, a view that primarily sees the task as one of finding approaches and speakers that engage the listener. If there is any element of proselytising for science, it is subordinate to the gatekeeping function of creating the right kind of balanced output.

5.3 Third Programme

Although ideas for an additional, third, domestic radio service had been circulating within the BBC during the war, bringing them to fruition after the war took longer than expected. The new third programme, entitled – after much deliberation – 'Third Programme', did not begin broadcasting until September 1946. Owing to technical difficulties and problems with wavelengths, the service had a limited reach, and for several years could only be heard by about half the UK population.

The brief for the Third Programme was that it should be a 'cultural' station.[171] Its terms of reference made no mention of science:

> The Programme is designed to be of artistic and cultural importance. The audience envisaged is one already aware of artistic experience and will include persons of taste, of intelligence and of education. [...]
>
> The Programme need not cultivate any other audience, and any material that is unlikely to interest such listeners should be excluded.[172]

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170 Cox (1946), p.24. This conference was a joint Royal Society/British Association event on 'The Dissemination of Scientific Information to the Public', held on 8 July 1946. The conference accepted a recommendation from a working group that a Bureau of Scientific Information be set up to which press and broadcasters could turn for authoritative scientific information. (British Association for the Advancement of Science, 1946). The absence of any mention of this bureau in BBC documents relating to programme production suggests the bureau had little effect as far as broadcasting was concerned.

171 Whitehead (1989), p.14.

172 WAC R34/602 memo Programme C Terms of Reference', 16 January 1946. Quoted in Carpenter (1996) pp. 10–11.

The Third Programme had no regular timetable of programme 'slots'. Broadcasts lasted for as long as they needed to last. The service operated only during the evening, and listeners were not expected to spend the whole evening with the service. Indeed, it was considered undesirable for them to do so. Rather, listeners were expected to tune in for just the broadcasts that interested them or which aroused their curiosity, and then to switch off, or listen to another station. Selective listening had been Reith's intention when first formulating his concept of public service broadcasting, but by the 1940s the reality was different, especially with the Forces, and, later, Light programme. Briggs has written that by the later 1940s 'the Light Programme audience had quietly acquired some of the characteristics of the mass television audience of a far later date.'[173]

Initial listening figures for the Third Programme were encouraging, but after about a year's operation they were around 1% to 2% of the total radio audience.[174] In spite of the small audience for the Third programme, its listeners were disproportionately influential. A defence committee set up in 1957, when the service was being cut back, numbered composers Michael Tippett and Ralph Vaughan Williams, and actor Laurence Olivier, among its members.

The Third was conceived as reinforcement of the existing services, rather than as a replacement. However, until 1948, the three services, Home, Light and Third, were expected to compete with each other within the BBC monopoly, and within the remits set for them. This competition was apt to lead to poor coordination between the three services, manifested as duplication of spheres of interest and pursuit of the same audiences. The fiercest competition was between the Home and the Light, with disputes over whether programmes were too light for the Home, or not light enough for the Light.[175] The official removal of the competitive system in 1948, did not, however, end conflicts between controllers of the three services.[176] To some extent, then, BBC managers regarded lack of coordination between different areas of broadcasting output as a problem requiring some kind of managerial intervention.

The first Controller of the Third Programme was George Barnes. He has already featured in this story in his earlier role as Director of Talks during the War. In that role he had responded to complaints from the British Association in 1942 about the dearth of science broadcasting by setting up an advisory arrangement with the

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[173] Briggs (1996d), p. 60.

[174] Listening figures have remained in the region of 1% to 2% through the various incarnations of the service – despite many Controller's attempts to raise the service's popular appeal.

[175] Briggs (1995b), pp.71–3.

[176] Briggs (1995b), p. 74.

secretaries of the Royal Society, and by diligently restoring science broadcasting to the schedules. However, his background was in the humanities, and his personal notes on the aims of the Third omit any reference to science:

> Designed to present the great classical repertoire, its music and drama, and, in so far as they are broadcastable, in [sic] literature and the other arts.[177]

In the omission of any mention of science, there is a close parallel with an observation by J. G. Crowther on the founding of the British Council in 1934:

> The founders of the British Council, in the very characteristic manner of the ruling classes of those days, had naturally identified culture with language, literature and arts. It was not that they were prepared, after reflection, to deny that science was part of culture; it was merely that it had scarcely occurred to them to include it.[178]

In fact, despite the absence of science from the Third Programme's remit, the coverage of science on the Third was strikingly enterprising. This appears to have been owing to the initiative of individual producers, rather than through a policy directed by the Controller of the network or through the intervention of scientists outside the BBC. Producer Peter Laslett brought Fred Hoyle to the Third, and Hoyle's series on the *Nature of the Universe*, broadcast on the Third in February 1950 and repeated in the summer on the Home Service, led to Hoyle's being judged the most popular broadcaster of 1950.[179] Producer T. S. Gregory supervised several broadcasts relating to computers and artificial intelligence in the early 1950s, when digital computers had only recently become a reality.[180] The Third Programme's broadcasts in this field were more comprehensive than those on either of the more popular networks.[181] Other examples of science broadcasting from the early days of the Third include Professor Neville F. Mott speaking on *Waves or Particles?* on 12 September 1947, Jacob Bronowski's series *The Common Sense of Science* broadcast in April and May 1948, and pioneering cyberneticist W. Grey Walter speaking on

[177] George Barnes archive, Kings College Cambridge, 72/62 'Miscellaneous notes on Third Programme'.

[178] Crowther (1970), 228.

[179] Hoyle was brought in at fairly short notice to give the *Nature of the Universe* series. The producer of series, Peter Laslett, had originally engaged the historian Herbert Butterfield to give a series of talks related to his recent book *The Origins of Modern Science*. Butterfield pulled out, and Laslett, who had been a contemporary of Hoyle at Cambridge University, turned to Hoyle to fill the slot. Hoyle's series contained the first public use of the term 'big bang'. (Gregory, 2005, pp.46–7)

[180] Jones (2004)

[181] Jones (2002)

Electrical Activity in the Brain on 28 April 1948. Grey Walter went on to be a prolific broadcaster.[182] Many more examples could be given.

[182] WAC Grey Walter contributor file.

HOME SERVICE

342.1m.

6.30 a.m., Howard Lucraft and his Music. **6.55**, Weather. **7**, News. **7.15**, Reveille: Albuhera Day ceremony. **7.30**, David Java and his Orchestra. **7.50**, "Lift Up Your Hearts!" **7.55**, Weather. **8**, News. **8.15**, Eddie Carroll and his Sextet. **8.45**, Light Music. **9.15**, Semprini (piano). **9.40**, Schools. **10.15**, Service. **10.30**, Band of the Coldstream Guards. **11**, Schools. **12**, Edmundo Ros and his Rumba Band. **12.25**, "Opportunity Knocks." **12.55**, Weather.

1, News. **1.10**, Harry Davidson and his Orchestra, with Ian Blair. **2**, Cricket scores. **2.5**, Schools. **3**, Arthur Reckless (baritone), and Tomford Harris (piano). **3.30**, Lawn Tennis: The Davis Cup—Great Britain v. Czechoslovakia (second round), from Wimbledon. **4**, For Women. **4.15**, London Light Concert Orchestra. **4.45**, "Talking About Films," by Francis Crowdy. **5**, Children's Hour. **5.55**, Weather.

6, News. **6.20**, Records. **6.45**, "Enterprise and Achievement": Ceylon, by Bernard Braine. **7**, "The Adventures of P.C.49." **7.30**, "Ray's a Laugh." **8**, Flotsam (B. C. Hilliam), and Robert Easton. **8.15**, B.B.C. Theatre Orchestra, and Eugene Conley (tenor). **9**, Big Ben Minute; News. **9.15**, "Leopold—the Beloved," a comedy by Jean Sarment. **10.45**, To-day in Parliament. **11-11.3**, News summary.

TELEVISION

11 a.m.-12 (noon), Demonstration film. **3-6**, Lawn tennis: The Davis Cup, from Wimbledon. **8.30**, Newsreel. **8.45**, "The Ware Case" (film). **10**, "Sea Rescue" (film). **10.15-10.30**, News (sound only).

THE LIGHT PROGRAMME

1,500m. and 261.1m.

9 a.m., News. **9.10**, Records. **10**, Stradivari Orchestra, with John Lewis (tenor). **10.30**, Forces' Educational Broadcast. **10.45**, Molly Forbes (organ). **11.15**, "The Boar-Pig," a story by "Saki" (H. H. Munro). **11.30**, Band of the Life Guards, with Dennis Noble (baritone). **12.15**, Music from Hamburg. **1**, Sandy Macpherson (organ). **1.15**, B.B.C. Scottish Orchestra. **2**, Woman's Hour. **3**, Reginald King and his Courtiers. **3.30**, Roy Wallis and his Band. **4**, "Mrs. Dale's Diary," by Jonquil Antony. **4.15**, Bert Barnes (piano). **4.30**, "Lover's Leap," a play by Philip Johnson. **6**, Henry Croudson (organ). **6.30**, Community Singing. **7**, News and Newsreel. **7.30**, Show Parade: "Sweet Corn," by Robert Stannage; and "The Story Ends," by Robert Stannage and Bernard Henry. **8**, Records. **8.30**, "Spot the Lady" (part 4). **9**, Henry Wendon, and Mantovani and his Orchestra. **9.30**, Variety from the North. **10**, News. **10.15**, "Gordon Grantley, K.C." (part 5). **10.35**, Geraldo and his Orchestra. **11.15**, Spa Orchestra, with Dorothy Pouishnoff (piano). **11.56-12**, News summary.

THE THIRD PROGRAMME

514.6m. and 203.5m.

6 p.m., Jean Mackie (piano). **6.30**, "Flight into Egypt," a story by Jules Supervielle. **6.50**, Bach Recital: Max Rostal (violin). **7.15**, "Egypt To-day," a talk by Lord Kinross. **7.40**, 18th-Century Chamber Music. **8.15**, The British Council: a feature programme. **9.15**, Serenade Concert. **10.30**, James Joyce; a talk by his brother, Professor Stanislaus Joyce. **11**, Martin String Quartet. **11.30-11.50**, The Churches of the Norfolk Marshland; a talk by Alec Clifton-Taylor.

Figure 5.1 Broadcast schedule for Monday 16 May 1949, from *The Times*, p. 6 (columns re-arranged). Television at this stage is still a small part of the schedule.

Science broadcasts on the Third tended to be more philosophical or speculative than those on other networks, for instance *Science and Philosophy*, broadcast on 17 September 1948, or the series *The Physical Basis of Mind*, broadcast in May 1949. The actual programme formats were still, however, fairly conventional. Discussions in the late 1940s and early 1950s were scripted, or transcribed from unscripted off-air discussions, which were then tidied up, and read by participants pretending to be having the discussion 'live'.[183] The surprising extent of science broadcasting on the Third – surprising in view of its absence from the remit of the Third – suggests, once again, that producers had considerable autonomy to create the kinds of programmes they considered appropriate to the network.

From the point of view of this thesis, three of the most striking features of the inauguration of the Third programme were the following:

1 Scientists and organisations who had criticised the BBC's science coverage appear not to have intervened with the BBC to ensure a privileged place for – or even an adequate coverage for – science on the new network.

2 The Third Programme in practice certainly did not neglect science, and, on the initiative of individual producers, science programmes were often more probing and adventurous than those on other networks.

3 The absence of science from the cultural rhetoric surrounding the new service, coupled with the sometimes adventurous science coverage that actually appeared, suggests that, at the managerial level, the BBC was not so much opposed to science as forgetful or indifferent towards it.

5.4 Post-war attitudes to science

The first few post-war years saw a developing apprehension about science among many members of the public and intellectuals alike.[184] The atomic bomb was to a large degree responsible for this; and yet there was also an appreciation that science had played an important part in the allied victory. An indication of the ambivalence – even hostility – towards science was provided by an anonymous leading article in the *Times Literary Supplement* in October 1945 (Figure 5.2). Entitled 'Ariel Frustrated', it argued that science, and the materialist outlook associated with it, lacked a moral dimension. The author considered that the intellectual attainments of technologists were slender:

[183] Carpenter (1996), p. 122.

[184] Broks (2006), p.73,

> The lessening of faith in institutional religion, which has accompanied the strides made in the technical sciences, has effected immense changes in the conditions of life. It has also enhanced the prestige of the technologist out of all proportion to the intellectual effort expended on the acquisition of his skill.[185]

The article's author suggested that scientists and science, far from meriting more influence over society – as had been argued by many scientists before during the war – already had too much:

> the manifold applications of modern science have placed instruments of power in the hands of men who are not necessarily qualified by character to be entrusted with their use.[186]

According to the author, the problem with concentrating so much power in scientists' hands was that the pursuit of scientific knowledge was a circumscribed activity, which took no account of spiritual enlightenment:

> It is reasonable to ask for the credentials of those who are in a position to exercise such powers. [...] Unlike learning in the old sense, scientific techniques are without pedigree, having a bearing on some of the functions of man but not upon his nature as a whole. No technical skills, however numerous or productive, are a substitute for the loss of spiritual truth. [...][187]

The author's point of view was one that set little store by the economic importance of science to modern society, which many scientists had made a central argument in their case for giving science higher status in the BBC.

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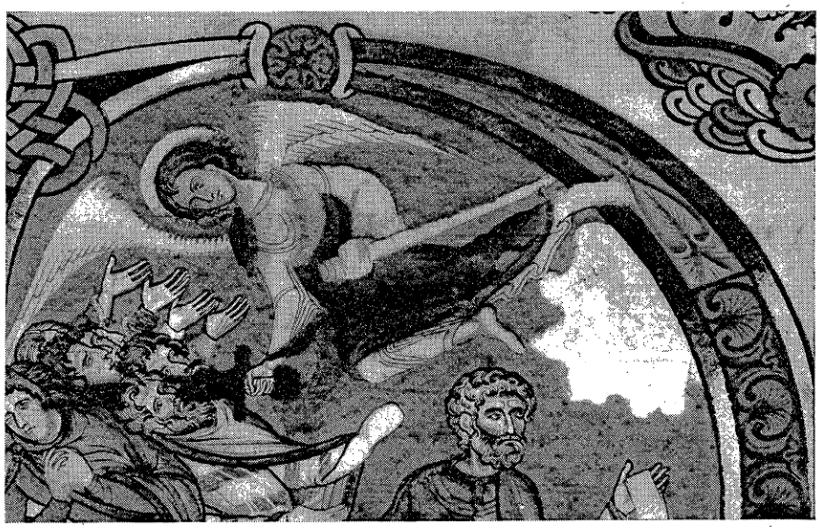
185 Lutyens (1945), p.481.

186 Lutyens (1945), p.481.

187 Lutyens (1945), p.482.

THE TIMES
LITERARY SUPPLEMENT
No. 2,280 44th Year SATURDAY OCTOBER 13 1945 POSTAGE (INLAND 1½ ABROAD ½D) PRICE 3D



"The Covenant with Abraham; the Slaying of the First Born." Detail from one of the initials to Psalm 102 in the Winchester Bible, reproduced in "The Artists of the Winchester Bible," which is reviewed on page 490.

ARIEL FRUSTRATED

HISTORY, in recording those deeds especially symbolizing the Nuzi reign of terror and the methods by which it endeavoured to pursue its purpose to dominate the human mind and destroy its gift of creativeness, will find a characteristic example in the destruction of the buildings which housed the famous Columbaria Library in Florence when the approaches to the Ponte Vecchio were mined. The sowing of mines in the ways of life and among treasures of the mind preserved from age to age is one manifestation, stretched to the crudity of barbarism (as if to point a moral), of a process which may become universal if unchecked—the decay of the sense of values that ensues when man surrenders his individuality and his natural dignity to a vast mechanization. This is the way to spiritual death, to the fulfilment of Blake's prophetic words: "Man becomes what he beholds."

* * *

Fortunately, about three-quarters of the antique Columbaria Library was recovered before the débris was swept into the Arno. Besides miscellaneous pamphlets and small works, the buildings housed some 6,000 books dating from the seventeenth century, of which 1,000 were saved. The number of volumes in the library before the disaster is not comparable with the collections of great modern libraries, and obviously the number in the early collection must have been substantially less. Values, however, are not measured by figures: it is not unreasonable to surmise that as late as the sixteenth century students could have possessed a cursory acquaintance with most of the books and manuscripts in a university library, and that a fair proportion of them in the course of time could have chosen to saturate their minds with the teaching of what was in effect a magazine of the essential knowledge of the ancient world, and an introduction to the new. A scholar or student thus entered into a fellowship whose authority was derived from a common but widely diffused experience. They were highly educated men, and many of them were wise ones; yet they formed a constituency of general readers, not of specialists. The dissemination of learning may have been restricted by modern standards, but in the age of Bacon the ground in which the seed of learning germinated was assiduously cultivated. And if this was not generally true before the age of printing, it is much less true in the present age, when the most diligent general reader can do no more than glance at whole catalogues of subjects. Our vast specialized output of books had no counterpart in the past.

The signs are unmistakable, if we stop to consider them, that, paradoxically, ignorance has increased proportionately to the extension of scientific knowledge. And if it should be argued that at any rate the butter has been better spread, it would not be an ungrateful retort that it argues no more than that the sources of inspiration have run dry and that knowledge is a finite commodity with a limited capacity for distribution without dilution; whereas it was once a living tree whose roots drew ever renewed nourishment from the unplumbed profundities of the human soul. Milton, for instance, as a student of modern tongues as well as a classical scholar, was familiar with the whole literature of the civilized western world. He had, besides scholarship, unusual qualities of mind; but otherwise there was nothing extraordinary in his attainments. He was perfectly adjusted to his world—one in which specialization had not yet superseded the cultivated eclecticism which was wont to give cogency and depth to civilized intercourse.

* * *

Nor was this knowledge, to give it no weightier name, the exclusive property of an educated minority in which it achieved a diversified, individual flowering; it was transmitted to the common man through a continuing tradition, as well as through the moral and teaching agency of the Church. The inimitable genius of a Leonardo or a Shakespeare may signify nothing beyond its uniqueness, although the base on which such talent was reared must have been uncommonly broad, while the versatility of such commanding spirits as Michael Angelo or Wren, to choose two names at random, would be exceptional at any time. Yet when, merely because they have left unimpeachable records, we read of the wide-ranging activities and humane scholarship of ordinary men like John Evelyn we are surely entitled to credit their contemporaries as a whole with a degree of sensibility and appreciation that has largely vanished from our lives to-day. The common man played his part and enjoyed it. The joyousness and confidence of what survives of the usages and memorials of the traditional countryside leave no room to doubt the variety and simplicity of the old rural life. The people's knowledge was not less profound because it was expressed in the cunning of their hands rather than in ideas. It was deep, subtle and comprehensive; just as, in an alien civilization and on a different plane of experience, was the requirement for the degree of Mandarin, before the old China, grown weary, aspired to become a modern, technical nation. We are told that candidates for the examination of the Vermilion Pencils were required, not to answer questions, but to undergo seclusion while they stated simply what they knew; and we may be sure that what they were expected to know was not the less pertinent to the spiritual welfare of mankind because it excluded any lively comprehension of the nature of the physical universe.

* * *

The ancient stem has many branches. When in a Heine or a Bergson we witness the impact of the old rabbinical teaching on the civilization of the west, it is not to be wondered at if others who value the dignity of their race should seek to save a great cultural tradition from obliteration.

The lessening of faith in institutional religion which has accompanied the strides made in the technical sciences, has effected immense changes in the conditions of life. It has also enhanced the prestige of the technologist out of all proportion to the intellectual effort expended on the acquisition of his skill. Moreover, the manifold applications of modern science have placed instruments of power in the hands of men who are not necessarily qualified by character to be entrusted with their use, or the use of the social prestige and influence which our modern age permits them to exercise. We tend to produce a mass of moderately educated specialists, whose knowledge may be restricted to a single department of biochemistry or mechanics, whose sense of responsibility, in so far as it is admitted, is to science. Standing opposite are the few magnates and monopolists, in themselves no doubt innocent of malevolence, who exploit for

Figure 5.2 ***Times Literary Supplement*****, 13 October 1945, with Lutyens's article 'Ariel frustrated' deprecating the high status of science**

The article's unnamed author was Robert Lutyens, son of architect Edwin Lutyens, and himself an artist and architectural historian.[188] Lutyens's article sufficiently impressed the BBC's Controller of Talks, George Barnes, to inspire him to plan a radio debate between Lutyens and a representative of the world of science. The scientific side of the debate would have as a premise the enormous contribution science had made to winning the war.[189] In the end, the debate appears not to have taken place, and Lutyens himself said he had no wish to participate.[190]

A more fruitful attempt by radio producers to engage with science's place in the post-war world came a few months after Lutyens's article with the series *The Challenge of Our Time*. Producer Grace Wyndham Goldie began planning this series in late 1945 or early 1946. She felt the momentous nature of the times called for serious analysis, and sought advice from 'leading scientists, philosophers, churchmen, historians, artists and others' as to the issues that should be addressed in the talks.[191] The results surprised Goldie. Instead of the miscellany of topics she expected, one subject dominated: 'the lack of synthesis in modern thinking, and in particular the wide gulf between the scientific and the humanistic approach to life.'[192]

The Challenge of Our Time was broadcast in the spring of 1946. Speakers included Arthur Koestler, J. D. Bernal, E. M. Forster, Michael Polanyi, J. B. S. Haldane, C. H. Waddington, Benjamin Farrington (Professor of Classics) and V. A. Demant (theologian). Listening figures varied between three and five million, which were high for serious talks, and by popular demand the talks were later published as a book.[193]

J. D. Bernal, in his talk, considered that although the dangers facing humanity were huge, so also were the possibilities for benefits available from science. The Soviet Union provided an example of rational social planning. E. M. Forster considered that *laisser faire* economics led to 'the black market and the capitalist jungle.' On the other hand, regulation of life was apt to lead to 'secret police, the road to serfdom and community of slaves.' Polanyi considered that the problems facing society were political and spiritual, not technical. A spiritual enlightenment was needed, and

[188]The Online *Times Literary Supplement* reveals Luyens as the author of 'Ariel Frustrated'.

[189]WAC R51/523/4, memo 29 October 1945.

[190] WAC R51/523/4, record of Interview by Barnes with Robert Lutyens, on Arts vs Science, 29 October 1945.

[191] Goldie (1948), p. 11.

[192] Goldie (1948), p.12.

[193] Goldie (1948), pp. 13–14. The published version of the talks was Goldie (1948).

specifically one based on Christianity. J. B. S. Haldane took issue with Polanyi: 'Professor Polanyi, who opposes scientific planning in the name of freedom, has suggested that "we should compile a complete code of moral behaviour." [...] How easily one is led into spiritual planning if one rejects economic planning.'[194]

Grace Wyndham-Goldie contrasted the 'relative pessimism' of the humanities speakers and the 'relative optimism' of the scientists.[195] But one contributor to the series, Professor A. D. Ritchie (a philosopher), identified more sharply the significant difference. The scientists, Ritchie said, except for Polanyi, saw the problems facing society as economic. For them, a properly planned and administered society was the best safeguard against the dangers of the era. For the non-scientists (but including Polanyi), the problem was one of individual morality. The world would be safer if individuals had a more highly developed moral sense.[196] One camp wanted social reform, along generally scientific lines, and the other wanted individual reform.

The problematic standing of science at this period led some 'public' scientists to temper their formerly whole hearted scientific advocacy. Henry Dale, for example, who in 1943 had spoken of the central place of science in modern life at the British Association conference, had, by 1950, adopted a more nuanced view of science's centrality:

> A mere acquaintance with the facts of science cannot by itself enable men to deal safely with such problems [i.e. the problems of the postwar world].[197]

Now, according to Dale, writing in a BBC publication, science was specially important, at least in part, because of the danger it offered for 'catastrophic misuse'. Science was thus everybody's concern, because everybody needed to be concerned about its misuse. Broadcasting, for Dale, had a vital role in fostering an enlightened interest in science.[198]

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194 Goldie (1948), pp. 25, 26, 32, 43–45, 49.

195 Goldie (1948), p.12.

196 Goldie (1948), pp 62–6.

197 Dale (1950), p. 137.

198 Dale (1950), p. 137.

5.5 Oliphant and the Anderson subcommittee

5.5.1 Introduction

At a meeting of the BBC's General Advisory Council in the summer of 1949, Lawrence Bragg, a member of the Council, said: 'I have, more than once, asked the BBC informally whether there was any set-up in the way of a scientific adviser to the BBC or any sort of committee which could be called on for its advice.'[199] This appears to be the first post-war resurrection of the idea of giving the scientific world more influence over science broadcasting.

The Director General William Haley replied sympathetically to Bragg:

> [...] two matters have arisen which, I think, rather help towards the end we both have in mind.[200]

Haley's reference to 'the end we both have in mind' suggests that he supported to some extent Bragg's notion of a scientific adviser or committee for the BBC. However, it was Haley himself who, in November 1943, as described in Chapter 4, had commented that the acceptability of the British Association's proposals for scientific advice was contingent on the limitations that could be set on any such system. Haley had also found the Association's proposal for a scientific programme officer 'most dangerous'.[201] I will return later to the difference in Haley's responses to these two sets of proposals.

Haley mentioned in his response to Bragg that two matters had arisen that might help achieve the end desired. One was the setting up of the Beveridge committee of enquiry in relation to the next BBC charter. [202] (In the event, the report of the Beveridge committee had nothing to say that was relevant to Bragg's enquiry.) The other matter was:

> ... the question raised by Professor Oliphant which, we feel, is one on which the [General Advisory] Council, and particularly those members of it interested in science, could help us. [203]

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[199]WAC R6/34 minutes of meeting, 2 June 1949. Besides Bragg, other scientific members of the General Advisory Council at this time were Marcus Oliphant and A. V. Hill (WAC R6/34, letter from George Barnes to Jacob Bronowski, 8 June 1949).

[200]WAC R6/34, letter from W J Haley to Lawrence Bragg. 26 May 1949.

[201] WAC R51/529, memo 24 November 1943.

[202]WAC R6/34, letter from W J Haley to Lawrence Bragg. 26 May 1949.

[203]WAC R6/34, letter from W J Haley to Lawrence Bragg. 26 May 1949

Haley was referring here to a letter he had received from the physicist Marcus Oliphant on 16 May 1949. During the war, Oliphant had been involved in the separation of uranium isotopes as part of the atomic bomb projects in the UK and USA. After the war he pursued peaceful uses of atomic energy. He was also a scientific member of the BBC's General Advisory Council, along with Lawrence Bragg and A. V. Hill, and therefore moved in the 'border' zone between broadcasting and science. The letter Haley had received from Oliphant began, as scientific interventions at the BBC tended to, by drawing attention to the importance of science and technology in the underpinning of contemporary life:

> (1) We live in a technological society built on the results of scientific investigation. Broadcasts on science by the BBC are almost always concerned with the general themes of 'Science and Society', 'Science and War', 'How science affects you', and so on. This arises from the profound social implications of applied science, and is very necessary, but it engenders in the public conscience quite a wrong reaction to science in general, arising from this lop-sided presentation of applied science, without conveying the spirit or content of the fundamental science on which it rests.
>
> (2) I will suggest that the BBC might like to set up an Advisory Committee on Scientific Broadcasting, on the general lines of the committees already in existence on agriculture etc and perhaps also strengthen the scientific staff employed on the organization and preparation of scientific broadcasts.[204]

What distinguishes Oliphant's intervention from others comes in his third point:

> (3) What I should like to see is some break-away from the perpetual theme of 'science and society', with the inevitable excursion of the scientist into fields of politics where he does not shine, towards an attempt to present science as natural philosophy, as a way of life and a culture in its own right. I believe it can be done. I don't think scientists should always appear as Utopian idealists, as Marxists, or as amateur politicians. Cannot we sometimes forget war and atomic weapons, industrial advance or productivity, medicine and food production or science and religion, and say something more of the history and growth of science, of the great revolution wrought by the introduction of the experimental method, of the intellectual satisfaction and fun of science, and of the scope and content of modern science, all regarded as contributions to knowledge rather than as

[204]WAC R6/34, letter from Mark Oliphant to W. J. Haley, 16 May 1949.

> awe-inspiring or useful facts? ‘Nature Parliament’ in the Children’s Hour has some of the qualities I hope to see in some general scientific broadcasting.

Oliphant’s third proposal had much to recommend it as far as the BBC was concerned. For one thing, it opened a comfortable space between science and political controversy. Also, as shown earlier, there was widespread anxiety after the war about the destructive potential of science. In this respect, Oliphant’s invoking of the categories of ‘applied science’ and ‘fundamental science’ is striking. These categories had scarcely featured in earlier interventions, such as those by Crowther or McClean, where the application of science was continuous with theoretical science. Oliphant, by contrast, associated applied science with social consequences, leaving fundamental science free to be celebrated as a cultural activity, free of problematic social consequences. In this way Oliphant configured an internal boundary within science, allowing him to isolate the characteristics of science most useful to him in this context, and to disembarrass himself of those which might undermine his advocacy of science.[205]

[205] Oliphant was not alone in advancing a cultural claim for science around this time. In 1949 the nutritionist V. H. Mottram wrote on the broadcasting of science: ‘A knowledge of the functions of science, of its methods of procedure and of its discoveries, is as much a part of culture as is a knowledge of literature, history and the arts.’ (Mottram, 1949, pp.223–4)

Figure 5.3 Sir Marcus Oliphant

Picture from Carver *et al*. (2003)

Oliphant's intervention proved extremely influential. He developed his ideas, and, in their expanded form, they were submitted to a meeting of the General Advisory Council on 2 June 1949. At that meeting, he elaborated on how public knowledge of science would have a social benefit:

> All thinking men are worried by the breakdown of the world's morality, due to the changes in the way of life of nations and to the terrible concentration of power in the hands of individuals, which is one of the results of the labours of the scientist. The evil wrought by science springs, not from any intrinsic evil in science itself, but from its misuse by men who do not really understand what science is. It must therefore be one of the primary duties of the BBC to find a medium for the rapid education of the public towards a properly balanced view of what science is, how it works and how it affects the lives of all men, while at the same time emphasising its limitations and what it might achieve in the future.[206]

As with earlier interventions, Oliphant advanced here the idea that the BBC has a duty towards science. However, for the earlier interventionists, the public needed to know more science for its own good. Oliphant said that the public needed to know more science so that it could better recognise the misuse of science. Dale made much the same point in the extract quoted in Section 5.4.

After paying tribute to the BBC's efforts in science broadcasting, Oliphant criticised the BBC for failing to regard science as a cultural activity:

> Science is presented, rightly, as factual knowledge with profound social implications, but it is not conveyed as a human activity in which men find an innate, indeed almost a spiritual satisfaction, in which it is fun to take part, or as a process beginning in the 17th century and going on with accelerating pace. For the BBC, science is a solemn business, in the presentation of which careful and unemotional statement of fact is required by the producers, who seem unable to imagine that the same excitement can exist in the exploration of the unknown in science as they allow to colour an account of, say, geographical exploration.[207]

The Third Programme would have been the natural context in which to treat science as culture, but Oliphant made no reference to it.

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[206] WAC R6/34, report of GAC meeting on 2 June 1949.

[207] WAC R6/34, report of GAC meeting on 2 June 1949.

Oliphant's remarks were well received. A couple of members of the General Advisory Council welcomed his proposal as an alternative to the political motivation which, in their view, had been evident in too much science broadcasting. For instance, Sir John Anderson rounded off his approbation with:

> [...] unless some such plan as Professor Oliphant has indicated can be devised, scientists who feel that they have a [political or social] message to deliver will, I believe, tend to predominate in the programmes of the BBC by what is almost a process of self-selection, and the public may, therefore, gain a wrong impression. I therefore hope very much that the BBC, with whom the settlement of details must, of course, be left, may see their way to give effect to the general idea underlying Professor Oliphant's submission.[208]

Anderson conceded here that the BBC had final responsibility, an indication that he did not question the corporation's role as gatekeeper. Sir Lawrence Bragg, in supporting Oliphant, explicitly approved Oliphant's desire to see an emphasis on other aspects of science than its social and political implications:

> I like his reference to the fun of understanding the way in which things work. I do not see it quite so much as a presentation of what science means socially and politically as the satisfaction of a very widespread kind of curiosity on everybody's part to understand why things work the way they do. [...] An approach in this way is the thing which is going to make the nation science-minded, rather than starting at the other end and trying to tell them all the differences that science has made to the world.

Science was thus framed as a response to innate human curiosity. It became part of what humans did naturally, rather than being made to appear exceptional.

The outcome of these deliberations was the setting up of a working group, informally referred to as 'the Anderson committee', under the chairmanship of Sir John Anderson, to look into the question of science broadcasting. Following several meetings during 1949, the committee presented its report to the General Advisory Council at the end of the year. The following sections of this chapter will look at the deliberations of this working group and their outcome. However, to anticipate the story a little, the result of the working group's deliberations were so far removed from Oliphant's original proposals that it is worth recapitulating what Oliphant had proposed. His initial approach to the BBC was motivated by a wish to promote a *cultural* view of science, as opposed to a 'science and society' view which he said

[208]WAC R6/34, minutes of General Advisory Council meeting, 2 June 1949.

had dominated science broadcasting. He made no criticism of the BBC's uncoordinated science, nor did he suggest bringing all science production under the supervision of a scientific manager.

Before I review the working group's deliberations, it will be useful to look at two episodes that were more or less contemporary with Oliphant's intervention: a letter from Jacob Bronowski and the work of the Education Department on the comprehensibility of science broadcasts.

5.5.2 The Bronowski letter

Almost as Marcus Oliphant was writing his initial note to the Director General William Haley about his conception of a new kind of science broadcasting, Jacob Bronowski was setting down his thoughts on the same subject. Bronowski was not yet a well known figure, although, as mentioned earlier, he had broadcast a series *The Common Sense of Science* on the Third Programme in 1948.

Bronowski's letter, dated 29 May 1949, was addressed to George Barnes, who was at this time Director of the Spoken word. Like Oliphant, Bronowski was looking for ways of overhauling science broadcasting. Like Oliphant, he wanted to promote science as a part of general culture which any educated person could appreciate. Unlike Oliphant, he proposed himself as a scientific adviser to the BBC to help achieve this. His qualifications, he said, derived from his assiduous listening to the BBC's science output, from his breadth of scientific interests, and from his work as head of Projects Division at UNESCO, where he had both initiated a number of radio broadcasts and studied how broadcasters in other countries treated science. He added that he was himself a practising scientist. As referees for the quality of his work, he named Julian Huxley, Ben Lockspeiser and C. P. Snow.[209]

Bronowski found a symmetry between the general neglect of science in cultural life, and the neglect by scientists of the wider cultural context of their work:

> If non-scientists are to blame for their neglect of science, then scientists cannot escape as great a blame for their ignorance of literature, the arts and the general place of their work in culture and in history. It is in this respect that I have met the greatest shortcomings of science programmes in all countries, and particularly in the United States and in France.[210]

Bronowski's letter had little effect. Its contents were made known to the Anderson committee, but Bronowski was not invited to join the committee. When the

[209]WAC R6/34, letter from Bronowski, 29 May 1949.

[210]WAC R6/34, letter from Bronowski, 29 May 1949.

Anderson committee eventually recommended the temporary appointment of a scientific adviser (to anticipate the story again), Bronowski's name was suggested but passed over.

5.5.3 Education Department Research into comprehension of scientific broadcasting

During 1949, the BBC's Further Education Department conducted an experiment into listeners' comprehension of a number of broadcasts, including three on science.[211] The findings of one of the science experiments were published in an internal BBC document *Listeners' Understanding of a Broadcast Talk on Science*, dated October 1949.[212] This report had a bearing on the recommendations of the Anderson committee.

The leading light behind this experiment was Joseph Trenaman.[213] However, the experimental method used was recommended and developed by two educational psychologists outside the BBC.[214] The intention behind the experiment was to make educational broadcasts more effective, though it was thought that the experiment might also shed some light on the efficacy of science communication through the spoken word.[215]

Trenaman's experimental cohort consisted of over 250 experimental subjects. They were divided into seven categories according to their highest educational attainments. The categories were:

Graduate
Undergraduate
Grammar School Sixth form
Technical School Sixth form
City and Guild, and National Certificate
Skilled artisan
Elementary education

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211 Trenaman (1951), p. 173.

212 WAC R6/34, report *Listeners' Understanding of a Broadcast Talk on Science*, October 1949.

213 Briggs (1995b, p.741.

214 The experimental method was recommended by Dr P. E. Vernon, Professor of Educational Psychology at the Institute of Education, and had been used extensively by Professor F. C. Bartlett, Director of the Cambridge Psychological Laboratory. (WAC R6/34, report *Listeners' Understanding of a Broadcast Talk on Science*, October 1949, p.2.)

215 WAC R6/34, report *Listeners' Understanding of a Broadcast Talk on Science*, October 1949, p.2.

The experiment attempted to measure the subjects' understanding of a science broadcast objectively, rather than simply by asking subjects how much they had understood. The science broadcast chosen for the experiment was *What Are We Doing with Electrons?* by Professor Neville Mott of Bristol University, broadcast on the Home Service on 19 July 1949. It was the first broadcast in a weekly series entitled *New Frontiers in Science*. Although no recording survives, a transcript of a shortened version broadcast on the Overseas Service does survive.[216]

The essence of the test was measuring subjects' recall. Each subject listened to the broadcast and immediately afterwards wrote down everything they could remember of what the speaker had said. The subject's written recollections were subsequently checked against a list of 33 'teaching points' which had been produced beforehand by education officers and the producer of the broadcast. The 33 teaching points were classified into three groups: main teaching points, practical applications, and other teaching points. There were 3 marks for each main teaching point the respondent recalled, 2 for each practical application, and 1 mark for each of the other teaching points. Thus, if a subject recalled two main teaching points, one practical application and ten other teaching points, the score would be:

$$(2 \times 3) + (1 \times 2) + (10 \times 1) = 18$$

In all there were 5 main teaching points, 3 practical applications and 25 other teaching points, giving a maximum score of 46, although the report said that the maximum was 47. Markers had to judge whether the subjects' recollections showed comprehension or confusion. No extra marks were gained for verbatim recollection.

This experimental procedure raises questions over what exactly is being measured in this test. Did a subject who recalled more points necessarily understand the broadcast better than the person who recalled fewer points? The nature of the broadcast was somewhat discursive, and in the absence of a clear focus listeners may well have been hard pressed to tell the more important ideas from the lesser ones. However, for the purposes of this thesis, methodological matters are less significant than the use that was made of the results by the Anderson committee. Scientists of the eminence of Bragg and Oliphant appear to have accepted the results and conclusions of this experiment, as is shown later.

In the analysis of the experimental results, graduates and undergraduates were judged to have understood the broadcast best. All other groups were judged to have understood the talk less well in accordance with their educational attainments. This is

[216] The Overseas version of Mott's talk, retitled *What We Do with Electrons*, was broadcast on 21 July 1949.

shown in Figure 5.4, taken from the report. The rising graph line shows higher scores for subjects with higher educational attainments.

A score of 15 was taken to be a threshold of comprehension. This is shown on Figure 5.4 by the horizontal line marked ‘Limit of understanding’. The average scores of the graduates, undergraduates and sixth-formers were above this threshold, and all others were below.

Following the experiment, discussions were held with the subjects. The experimenters were surprised to find that interest in the talk was not correlated with comprehension. There appeared to be three distinct levels of interest, associated with educational attainment. This suggested that the seven categories of educational attainment could be aggregated into three larger categories, each larger category being defined by the level of interest in the talk of its members. These three aggregated categories are represented by the hatched columns in Figure 5.4. The height of each column represents a subjective assessment of interest in the talk by subjects within that category.

The greatest interest (the middle column of the figure) coincides with subjects whose average score was on the limit of understanding – as shown by the intersection of the graph line with the score of 15, designated ‘Limit of Understanding’, within the central column.

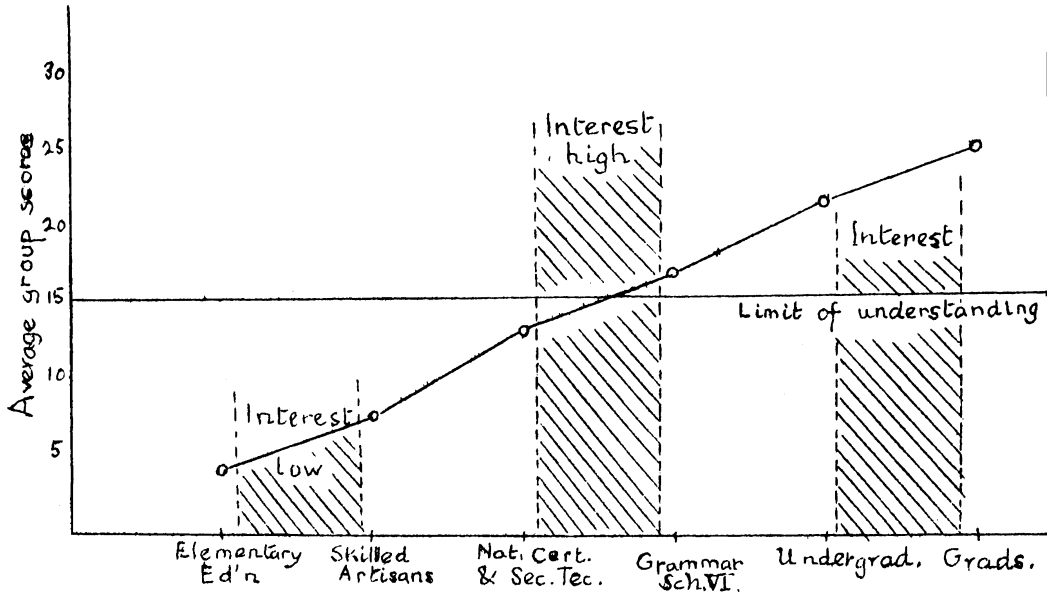

Figure 5.4 Relative interest and comprehension levels for subjects in Trenaman's test of listeners' understanding of Professor Mott's broadcast. The horizontal axis shows educational levels of the groups, ascending to the right. The vertical axis is average score in the comprehension test. (A score of 15 was taken as the threshold of understanding, marked here as 'limit of understanding'.) The ascending graph line shows comprehension rising with educational attainment. The hatched columns are aggregated groupings of experimental subjects' educational qualifications. Heights of columns represent subjective assessments of interest in the talk (Source: *Listeners' Understanding of a Broadcast Talk on Science*, October 1949)

The three-interest-levels finding was the most influential part of the report of the experiment. One of the report's conclusions was that 'the needs of the general public call for spoken word broadcasts in science at three levels of difficulty.' The levels of difficulty are not stated explicitly, but are implied to correspond to the three aggregated groupings of educational attainments shown in Figure 5.4. These levels were felt to correspond approximately to the typical educational attainments of audiences for the Third, Home and Light. As has been shown, a three-way stratification of the audience along the lines given in the report had in fact been made in 1938, and again in 1943 in a memo by Mary Somerville.[217] In that sense the report was not saying much that was new. It did, however, have an apparently empirical basis, and for that reason considerably influenced the deliberations of the Anderson committee, to which I shall return shortly.

In relation to the empirical testing of the effectiveness of radio broadcasting, this experiment was just a beginning. Further experiments were conducted in the early 1950s, and the progenitor of these experiments, Joseph Trenaman, eventually left broadcasting to become an academic in educational research.[218]

5.5.4 The Anderson committee: meetings and report

Marcus Oliphant's letter to the BBC, and subsequent discussions, led, as mentioned earlier, to the establishing of a working group, known as the Anderson committee. The committee was chaired by Sir John Anderson, and included Marcus Oliphant, Lawrence Bragg and A. V. Hill. Among the BBC representatives was George Barnes. The BBC's leading producer of science radio broadcasts at the time, Archibald Clow, was not on the committee, although he supplied papers for it. The committee met five times, and presented its report in November 1949.

The first meeting, held on 27 June 1949, consisted of little more than general agreement that there was an audience for science broadcasts of all sorts. Oliphant suggested that the BBC might take on to its staff two scientists, one for physical sciences and the other for biological science, and that through them eminent scientists would be enlisted *ad hoc*.[219]

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[217] A report published in 2000 to public attitudes to science in the UK splits the audience for science into six categories: Confident Believers, Technophiles, Supporters, Concerned, Not Sure, Not for Me (Office of Science and Technology and The Wellcome Trust, 2000, pp. 6–7.

[218] In 1954 Trenaman proposed a science series aimed at listeners to the Light programme. It would assume that listeners had learned little or no science at school, but were interested in everyday matters for which there was a scientific explanation; for example, how best to lay a fire, what rust is and how it can be prevented, and how soap and detergents work. It is not clear whether the series happened. (British Association Archive, letter from Joeseph Trenaman to D. N. Lowe, British Association for the Advancement of Science, 2 June 1954.)

[219] WAC R6/34, Minutes of Anderson Committee meeting, 29 June 1949.

Three major action points came out of the meeting:

1 Oliphant was to prepare an outline of the new types of science broadcast he wished the BBC to produce.

2 A survey of recent science broadcasts was to be compiled by the BBC.

3 A brief statement of existing practice in producing science broadcasts was to be prepared.

A couple of months later, on 16 August 1949, the results of the first two action points were presented. Oliphant's new types of science programme were grouped under six headings:

1 The history, aims and methods of science.

2 British advancement in science.

3 A series of discussions between 'men of distinction', who could debate controversial scientific questions.

4 A weekly 'newsletter' on science directed to scientists and technologists.

5 A series of programs on 'How it works'.

6 Recent advances in science.

Under each heading, brief ideas for programmes were set out. For example, under 'British advancement in science' were suggestions for series on Gilbert, Newton, Boyle, Faraday, Maxwell, Rutherford, and other figures from the physical and biological sciences.[220]

Under Oliphant's third heading, discussions, suggestions included: 'Is psychology a science?', 'Instinct or reason?' and 'Should scientific advance be stopped till man's moral nature develops further?'[221] The fifth heading, 'How it works', encompassed suggestions such as 'How insects fly', 'How anaesthetics produce unconsciousness or local relief from pain', and 'How an aircraft or ship is navigated.'[222]

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[220] WAC R6/34 undated Memorandum 'A Suggested Series of Programs [sic] on Science' by M. L. E. Oliphant.

[221] WAC R6/34 undated Memorandum 'A Suggested Series of Programs [sic] on Science' by M. L. E. Oliphant.

[222] WAC R6/34 undated Memorandum 'A Suggested Series of Programs [sic] on Science' by M. L. E. Oliphant.

In Oliphant's opinion, producing the new kind of material he had suggested would require the appointment of two senior BBC officials, one an expert on the physical sciences, the other with special knowledge of the biological sciences.[223] Oliphant suggested that C. P. Snow might be a suitable candidate for the 'physical sciences' expert.

The meeting at which Oliphant's ideas for new types of programme were presented also received the results of the survey into recent science broadcasts. This covered the period mid-March to June 1949, and part of it is shown in Appendix 2. Over seventy science broadcasts had been made in this period on the Home, Light and Third programmes. In addition, there had been schools science programmes and television science broadcasts, also included in the survey. Although the programmes listed were not explicitly related to the themes Oliphant proposed, the types of programmes he proposed were well represented. For example, in relation to Oliphant's category of recent advances, there were broadcasts on *New Calculating Machines* (i.e. computers), *Continuous Creation* (with Fred Hoyle), *Mesons*, *Supersonic Planes*, and many more. In relation to Oliphant's category of great scientists from history, there were broadcasts on Laplace, Einstein and Jenner. In relation to the 'How it works' category there were broadcasts on pre-stressed concrete, roads, bridge designs, and weather forecasting. In addition, there were natural history programmes, and philosophical broadcasts on *Science and Philosophy*, *The Physical Basis of Mind* and *Science Versus Idealism*. Furthermore, none of this type of programming was new, although this point was not made at the meeting. Instances of programmes that fit within Oliphant's categories can be found during the preceding couple of decades. For instance, relating to his aims and methods of science category, there had been *Scientists at Work* (autumn/winter 1936) and *What Is Science?* (autumn 1931). On the 'great men' of science, in addition to numerous individual broadcasts about figures such as Newton, Faraday and so on there had been *Pioneers of Astronomy* (autumn/winter 1927), *Pioneers of Health* (spring 1930) and *Biology in the service of Man* (summer 1932). Under the heading of 'How it works' could be placed the *Modern Inventions* series (spring 1939), and regarding current scientific developments there had been a number of attempts at regular magazine type programmes, as well as the series *Current Research in Oxford* (summer 1946). Oliphant is unlikely to have been aware of many of these earlier programmes, but they demonstrate that the kind of programme he advocated had existed for almost as long as the BBC had broadcast science. Furthermore, the broadcasts had been produced without the assistance of the two senior officials from

[223] WAC R6/34 undated Memorandum 'A Suggested Series of Programs [sic] on Science' by M. L. E. Oliphant.

a scientific background that Oliphant thought essential for his 'new' type of programming.

The list of recent broadcasts came as a revelation to the committee. Sir Lawrence Bragg, in particular expressed his surprise at the extent of science broadcasting, and pointed out that many of Oliphant's 'new' types of science programme were already being produced.[224] Oliphant was not present at the meeting to confirm or deny the truth of this judgement. However, at subsequent meetings he did not object to the minute recording Bragg's observation, and he was present at a later meeting where the following was minuted:

> More was being done by the BBC than the Committee had thought when they took up their enquiry. There was impressive evidence of wide activity and it was clear that science was getting a substantial representation. In the matter of presentation, including production, script-writing, etc, the BBC was carrying out an expert job in a satisfactory way.[225]

Oliphant's proposals for a new type of programming were quietly dropped. From now on, the meetings of the Anderson committee changed their tone. The committee became preoccupied by the lack of co-ordination of the BBC's science output across its diverse outlets. Specifically, the existence of science producers in different departments was regarded as a dispersion of talent. John Anderson recommended the coordination of science output across these departments, and 'a general oversight from the scientific point of view.'[226] None of this had been part of Oliphant's original concerns although, as has been shown, earlier scientific interventions had proposed greater coordination of the BBC's scientific output. Bragg was also exercised by the need for a:

> ... scientific commentator to explain what was going on in the world of science. [...] Sir Lawrence put in a strong plea for someone to go round institutions and universities to see what was going on and then tell the world what he had seen. He instanced several exciting things he knew about in Cambridge that would make good broadcasts.[227]

This idea echoes a suggestion made by J. G. Crowther in 1926 in his letter to Hilda Matheson.

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[224] WAC R6/34 Minutes of Anderson Committee meeting, 16 August 1949.

[225] WAC R6/34 Minutes of Anderson Committee meeting, 7 November 1949.

[226] WAC R6/34 Minutes of Anderson Committee meeting, 16 August 1949.

[227] WAC R6/34 Minutes of Anderson Committee meeting, 16 August 1949.

The organisation of scientific broadcasts into coherent strands, and their production by a centralised unit with a scientist at its head, now became the dominant issues for discussion by the committee. Whereas earlier interventions with the BBC on these issues had made very little progress, a head of steam now developed behind them.

The committee's report appeared towards the end of November 1949. It congratulated the BBC on the 'impressive volume' of its scientific broadcasting, saying that 7.5% of the time available for Talks was devoted to science.[228] The report of the subcommittee questioned:

> ... whether the output of science broadcasts is adequately coordinated so as to have their maximum impact on the interest and understanding of listeners at their various levels of knowledge and intelligence.[229]

The 'various levels of knowledge and intelligence' mentioned related to the findings of the research in the BBC's Further Education Department, but generalised here to cover all science broadcasting, and not just physics, which had been the topic of the experiment. As far as this committee was concerned, the three-way stratification of audiences and BBC services supplied a framework for styles of presentation:

> There is considerable scope in the Third Programme for dealing with new developments in science, for the benefit of the knowledgeable listeners. It would appear that, in this category, in particular, hearers appreciate the opportunity of listening to the famous scientist in his own voice. At the other end of the scale, it is clear that anything about science in the Light programme needs to be very Light indeed in order to gain a hearing; such broadcasts are best left to the skilled producer and scriptwriter, the role of the scientist being confined to checking the accuracy and emphasis of what is to be presented.[230]

The report recommended the experimental appointment for one year of a scientific advisor, whose role would be to:

> improve links between the various departments covering science and to ensure that the output matched the levels identified in the experiment

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[228] At this time there were 30 producers in the Talks Department, only one of whom, Archibald Clow, was a scientist. Clow thus represented 3% of the Department, but he was assisted by non-scientist producers, particularly for talks on the Third Programme. WAC R6/34, note by George Barnes, 4 July 1949.

[229] WAC GAC148 Report of the Special Sub-committee to consider broadcasts in science, 23 November 1949, p. 1.

[230] WAC GAC148 Report of the Special Sub-committee to consider broadcasts in science, 23 November 1949, p. 2.

foster links between producers and scientists outside the BBC

explore programme ideas

investigate methods of presentation

study audience reaction

explore the new potentials offered by television.

The report says nothing about the two main points in Oliphant's initial approach to the BBC, namely the need to create a new type of programme and the need for an advisory committee.

The report was circulated within the BBC, and a dissenting voice queried the need for coordination. It would require a wholesale structural change in the BBC:

> I do not see how, under the present constitution, there could ever be any adequate machinery for ensuring complete co-ordination of the Corporation's science output. The best we can hope for is that those who are guiding its policy and working out details at least keep in touch with each other so that they know what their other colleagues in this field are doing.[231]

For the unnamed author of this dissenting memo, the current lack of coordination was not a problem:

> I hope I am not being pessimistic in refusing to be distressed by [the lack of coordination of science broadcasting]. The range of science today is so vast in relation to the maximum time the Corporation can conceivably devote to it that any really comprehensive scheme seems impossible. Subjects must be selected for interest in their own sphere, general importance, intelligibility, and the availability of a first-rate speaker anxious to tackle any particular subject is another factor often worth consideration.[232]

Again there is evident here the professional broadcaster's concern with the need to serve the audience rather than the world of science, and the implication that the professional broadcaster knew how to do this. According to this memo's author, a high-level scientific adviser would be a burden rather than a help:

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[231] WAC R6/34, memo to Controller Home Service, 19 December 1949.

[232] WAC R6/34, letter from unnamed staff member to Controller of Home

> I am not impressed by the idea of appointing a high level scientific adviser without executive responsibility. So far as I can see our relations with the scientists are at the moment excellent and I can only see such an appointment as is envisaged here as clogging the machinery. I believe we can get all the advice we need under the present organisation.

Another BBC staff member, probably George Barnes, had earlier objected to the idea of a high-level scientist on the staff by suggesting that there would be a danger from using 'one channel', and that the post would be hard to incorporate into the BBC's management structure. He suggested that BBC staff would rather see the appointment of additional producers with scientific knowledge and training. [233]

The Board of Governors accepted the report's major recommendation for a scientific advisor to be appointed for a trial period, and set about trying to find a suitable candidate. Among the names considered were:

C. P. Snow
Julian Huxley
Jacob Bronwoski
Sir Henry Dale
Professor D. M. S. Watson
Professor A. M. Tyndall
Professor A. Egerton
E K Rideal

Sir Henry Dale was selected on the basis of the work he had done as President of the Royal Society. He had himself broadcast several times, and his advice had been sought by the BBC in the past. However, he was already in his mid-seventies. His appointment began on 1 July 1950 and continued for two years until 30 June 1952. In January 1953 he issued his report to the BBC Governors.

5.6 The Henry Dale experiment and report

The terms of reference of Dale's experimental appointment are fairly clear from the report of the Anderson committee, but Dale himself had views about science broadcasting and what it should offer the listener. An insight into these can be found in an article he published in the autumn of 1950, a few months into his appointment, in a BBC publication.[234]

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[233] WAC R6/34 Note on Minutes of GAC Science subcommittee 16 August (author indistinct, but as the note appears among other memos by Barnes his authorship is likely).

[234] Dale (1950).

Dale's starting point in his article was the importance of science, both as a deliverer of material benefits and as a way of thinking. He stressed the dangers of the abuse of knowledge, and the dangers currently threatening humanity: annihilation, over-population, starvation, and exhaustion of raw materials. Science was thus everybody's concern, and broadcasting had a vital role in fostering an enlightened interest in science. Dale acknowledged that the listeners' taste for science had limits, but suspected the limits had not been seriously tested. He pointed out that in his youth very few people were interested in 'serious' music, but promotion of music at popular concerts had created a large audience for it. He suggested something similar might be possible with science. He considered that television had great potential for popularising science.

Two years later, in his report at the end of his experimental appointment, Dale said that he found working with BBC producers highly enjoyable, and he was happy to pay tribute to them; but he found his role as advisor frustrating.[235] He had no office or secretarial support, and found it difficult to discover plans for forthcoming broadcasts. Dale's most natural point of contact within the BBC was Archibald Clow, a science producer in the Talks Department who produced the weekly *Science Review* and also talks on the Home and Third. Dale could see that his own presence, and need for assistance, imposed an additional burden on Clow, who was already overloaded with production work. After about a year, assistance was found for Clow, in the form of Nan Clow, a science historian, and also Archibald Clow's wife. This freed some of Archibald Clow's time. Dale drew on it with an easier conscience, but did not regard this as a satisfactory solution either for Clow or himself.

Dale felt that his scope for action was reduced by the constraints he was operating under. As far as his coordinating function was concerned, all he could do was arrange periodic interdepartmental meetings between producers involved in scientific projects (including regional projects). Each participant was required to let Dale know beforehand of current and future projects. The participants said the meetings were a useful opportunity to exchange information among themselves about personalities and subjects. However, Dale reported that there was no direct collaboration between producers in different departments as a result.

Dale exercised his advisory function when producers came to seek his opinion on scripts, but he was frustrated that his advice was invariably sought so late in production that very little could be done to modify the script significantly. However, he approved of the way television was shaping up, and found that he was able to

[235]WAC R6/186 Report to the BBC Governors, by Sir Henry Dale, 13 January 1953.

collaborate more effectively here than in radio, suggesting that because the medium was young its practitioners were more flexible.[236]

His particular recommendations were that less emphasis be placed on immediately topical scientific developments, and that people needed to know more of the scientific context. He suggested that a bank of 'foundation material' could be created to be drawn on at any time. Dale made no suggestion that all science output should be managed centrally, nor did he comment on this idea. He made no suggestion as to whether the post of Scientific Adviser should be continued.

Dale's report had little effect at the organisational level. The most pressing issue was whether another adviser should be appointed to continue the work he had been doing. Mary Somerville, who was the Director of Talks at the time Dale's report appeared, wrote:

> I cannot but regard the circumstances of [Dale's] appointment and our subsequent treatment of him as a somewhat unhappy page in BBC history.
>
> Although the BBC accepted the recommendation of the Anderson Committee to appoint a Scientific Adviser I do not think they ever subscribed to the assumptions underlying that recommendation i.e. that it is desirable in principle to co-ordinate BBC output, or approaches to scientists, or that it is necessary for any check to be placed upon producers' choice of speakers by 'establishing high-level contact with scientists on the requisite footing of informality'.
>
> [...]
>
> My main recommendation is that if we do appoint another Scientific Adviser his terms of reference should be framed to fit the facts of the situation inside the BBC. Thus the first question seems to me to be – Is a policy of coordinating programmes and approaches now to be adopted or not?[237]

Somerville implies that the experiment was doomed to fail. She also implies that the existing arrangements for scientific broadcasting were not negotiable where an advisor was concerned. Her 'cosmology' was based on the existing practices of the BBC. This was the natural order.

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[236] It could also be argued that the sheer volume of material produced on the radio greatly exceeded that produced for television, and hence the task of keeping abreast of television work was likely to be less daunting.

[237] WAC R6/186, memo from Mary Somerville to Director of Spoken Word, 26th January 1953.

The experiment begun with Dale was not continued, and science production proceeded as before. However, a useful consequence of the experiment from the BBC's point of view was that its failure could be exploited rhetorically to argue against co-ordination of production. Co-ordination could be said to have been tried and to have failed. Aubrey Singer, Head of Outside Broadcasts, Feature and Science Programmes, Television (and originator of the television science series *Horizon*), did just this at a public lecture on Science Broadcasting in 1966:

> Previous experience in this field had taught us that co-ordination of this sort did not really work and indeed actively discouraged the interest of production departments.[238]

By 'previous experience in this field', Singer appeared to refer to the Dale experiment, as no other attempt at co-ordination is recorded. Whether this experiment could really be counted as a true test of co-ordination is, at the very least, open to question in view of the conditions which Dale was obliged to work under.

The term 'coordination' in any case could signify several different things. As was shown earlier, improving 'coordination' between the Light, Home and Third was one of the reasons for removing the competitive framework in 1948. From this point of view, then, improving coordination signified the removed of duplication and inefficiency. From another point of view, improving coordination between science broadcasts reduced producers' autonomy.

I mentioned earlier in this chapter that Director General William Haley responded sympathetically to proposals from William Bragg in 1949 that were similar to proposals from the British Association in 1943 which Haley had regarded as requiring to be circumscribed and as 'dangerous'. I discuss this and related phenomena in the conclusion to this thesis, but I will point out here that Bragg made his proposal as a member of a BBC advisory committee, whereas the British Association's proposals came from an external organisation which, as has been shown, was regarded with suspicion by BBC managers.

5.7 Archibald Clow – senior science producer

The name of Archibald Clow has been mentioned in connection with the Marcus Oliphant intervention. Clow was one of the longest serving BBC science producers. His background was in chemistry and the history of science. He appears to have joined the BBC towards the end of the war, working on Forces' Educational Broadcasts, which were short slots of about 15 to 30 minutes interspersed in the

[238] Singer (1996), p.12.

output of the new Light Programme in the immediate post-war years. At some time in this period he assumed responsibility for the regular science magazine programme *Science Survey*, initiated by Ian Cox before the war and revived by him in 1946. This series ran until well into the 1960s.

At the time of Marcus Oliphant's intervention in the Talks Department, Archibald Clow was the only scientist among the staff of 30 producers. Clow supplied a memo to the Anderson Committee in which he outlined what his job entailed. He had to keep up-to-date with scientific developments by reading journals, attending conferences, open-days and exhibitions, visiting institutions; and surveying press releases from professional bodies.[239] Clow considered that because of this wide-ranging research:

> it is often easier for a BBC producer to get a better overall pattern of what is going on than for an individual scientist whose knowledge is much deeper but correspondingly narrower.[240]

When the scientific critics of the BBC urged the appointment of a high-level manager, one of the functions envisaged for the manager was liaison with the scientific world. A scientific manager, if appointed, would therefore assume part of the producer's job, and, on Clow's account, probably be less effective.

Clow made clear that reading journal and periodical articles by a scientist was not enough for him to assess whether the author would be a suitable speaker. The author's personality was not revealed on the page. Hence, personal visits to conferences etc were required. Having secured a radio speaker, there was still more work for the producer to do. The speaker's script needed to be edited, because, according to Clow, scientists too easily slipped into the jargon of their subject. What they said could often be expressed more simply with no loss of accuracy. Finally, many speakers, according to Clow, needed to be coached in microphone delivery, sometimes line by line.

The difficulty of finding first-rate science broadcasters prompted Clow to discuss the idea of using only a stable of proven speakers:

> An alternative would be to use only a few scientists often but I think this breeds unfortunate relations between the BBC and the world of science and I am certain that it is not far off the mark to say that if a scientist makes too

[239] WAC R6/34, 'A note by Dr Clow on the work of a producer of talks on science', 13 September 1949.

[240] WAC R6/34, 'A note by Dr Clow on the work of a producer of talks on science', 13 September 1949.

many microphone appearances he becomes suspect in the eyes of his fellows.[241]

5.8 Beveridge committee

During 1949 and 1950, the period of the Anderson Committee's deliberations and Henry Dale's appointment, the Beveridge committee was taking evidence with a view to issuing a report on the future of broadcasting (published 1951). Many outside bodies submitted evidence to this committee. Strategically, this would have been one route for critics of the BBC's science output to influence science broadcasting. In fact only two scientific organisations submitted evidence to Beveridge: the Association of Scientific Workers and the Electrical Association for Women. Their evidence is not reprinted in the report's accompanying volume which reproduces a selection of evidence. The report itself makes no mention of their submissions and does not discuss scientific broadcasting.

The major question before the Beveridge committee was whether the BBC should continue to enjoy a monopoly of broadcasting within the UK. The committee considered that the existing monopoly arrangement should continue, although there was a dissenting minority report. The majority recommendation was accepted. A couple of years later, however, there was a change of government from Labour to Conservative, and broadcasting legislation was changed to allow commercially funded television. This began in 1955.

Summary of Chapter 5

Anxiety about the dangers of science became widespread after the war, and was reflected in journalism and broadcasts (particularly the series *The Challenge of Our Time*).

The Third Programme began in September 1946 with an avowedly cultural remit. Although the objectives of the new service make did not refer to science, it carried adventurous science broadcasts, often of a philosophical or speculative character. These broadcasts often appear to have been created on the initiative of interested producers.

In 1949, Marcus Oliphant, a scientific member of the BBC's General Advisory Council, proposed a 'new' type of science broadcast which would break away from earlier 'science and society' broadcasts and, instead, present science as a cultural activity. he also proposed a Science Advisory Council.

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[241] WAC R6/34, 'A note by Dr Clow on the work of a producer of talks on science', 13 September 1949.

The Anderson committee was created to consider Oliphant's suggestions. A review of recent science broadcasts for this committee found the type of science broadcast advocated by Oliphant to be flourishing on the BBC. The committee switched its attention to coordination of science broadcasts. Drawing on the results of a BBC educational experiment, it identified a three-tier audience stratification, based on educational attainments, and suggested that science broadcasts should be pitched at these tiers as appropriate. The tiers corresponded closely with the typical audiences for Light, Home and Third services. The committee recommended the appointment of a one-year science advisor to coordinate science output across several BBC departments (including television).

Henry Dale was appointed as experimental scientific advisor, and served for two years from 1950–2. For this time he was inadequately resourced. He found he was unable to affect programme coordination significantly. Mary Somerville afterwards doubted whether the BBC had ever accepted that coordination of science broadcasts was desirable.

Chapter 6
Pilkington and the Science Consultative Group

6.1 Network Three

The 1950s was a decade of declining listenership for BBC radio. Competition came from television, especially commercial television (after 1955), and also from Radio Luxembourg.[1] These two competitors offered unabashedly popular, mass-appeal programmes. In 1956, Lindsay Wellington, BBC Director of Sound Broadcasting, and his assistant Richard D'Arcy Marriott, spoke of a need to shift radio broadcasting policy away from lingering Reithianism and towards populism:[2]

> The programme policy that I advocate implies the rejection of an attitude that many of us have grown up with, of having a mission to educate, to up-lift, to lead people on to better things, to give them what we think they ought to want rather than what they do want.[3]

The result was a working party on sound broadcasting, chaired by Marriott. Its report, entitled *The Future of Sound Broadcasting in the Domestic Services,* appeared in 1957. Among its proposals was a reduction in the broadcasting hours allocated to the Third Programme. The time taken from the Third would be allocated to a new network, on the same frequency as the Third but operating at times of the day when the Third was silent. This new network, eventually entitled Network Three, would concentrate on specialist interest and minority programming, and include adult education. Among its predominantly spoken-word output would be some existing series transferred from the Light and Home services, such as *Science Survey* and *Talking of Books*.[4] The time freed on the Home and Light by these transfers could be used for more popular programming. The proposals in the working group's report were generally accepted within the BBC, and, in spite of high-publicity protests from the academic and artistic worlds about the curtailing of the Third, Network Three began in September 1957.

It is convenient at this point to mention some changes to radio science production in the later 1950s, although they are out of sequence at this point in the historical narrative. Production of science broadcasts for Network Three fell to Archibald

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1 Carpenter (1996) p. 166 and Briggs (1995c), p. 36.

2 Briggs (1995c), p. 38.

3 WAC R34/1022/2, untitled memo by R. D'A Marriott, July 196, quoted in Carpenter (1996), p. 167.

4 Carpenter (1996), p. 170.

Clow, who also produced broadcasts for the Home Service. This left the Third without a designated science producer, and attempts to appoint someone ran into difficulties in the face of intense competition from industry 'which on the whole had more than the BBC to offer them.'[5] Eventually David Edge was appointed.[6] (Edge later became a pioneer of science and technology studies at Edinburgh university.) Possibly as a way to rationalise science production between Home, Network Three and the Third, a radio Science Unit was created around this time. The date of its initiation is uncertain, but it must have been in existence by July 1959.[7] The Science Unit initially consisted of senior Science Producer Achibald Clow, and two secretaries.[8] Later an additional producer appears to have joined the unit. (This may have been David Edge.) Although the Science Unit was an amalgamation of science-production effort, it was a long way from the kind of centralised production unit scientists had been advocating in the interventions described earlier. It was, rather, a sub-unit of the Talks department, and its management lay in the hands of Archibald Clow.[9] A further innovation was the appointment around July 1959 of a Science Correspondent in the News Division.[10] However, this was a short-lived post. Fourteen months after the post was filled, its occupant resigned and was not replaced.[11]

6.2 Snow's 1956 'Two Cultures' article

In October 1956, C. P. Snow published a short article in *New Statesman and Nation* entitled 'The Two Cultures'.[12] Three years later, ideas from the article, greatly expanded, were presented in Cambridge as the Rede Lecture, and subsequently

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5 WAC R6/239/1, notes of a meeting on 20 November 1958.

6 WAC R6/239/1, memo from Appointments officer to DSA CT(S) CTP 1.H.T.Tel 2. A.H.T.Tel, HEB, Dr Clow, 11 March 1959. This memo speaks of Edge having made a good impression at interview. The BBC staff list for December 1960, the first compiled after this memo, show Edge in post in the radio Talks Department.

7 WAC R6.238/1, memo from Archibald Clow to Harman Grisewood, 12 October 1960 refers to the Science Unit as having been in existence 15 months earlier than the date of the memo.

8 WAC R6/239/1, memo from Archibald Clow to Harman Grisewood, 12 October 1960. This memo gives the composition of the Science Unit as a senior producer and two secretaries, and mentions that the appointment of an additional producer is under consideration.

9 WAC R6/239/1, note from Harman Grisewood (Chief Assistant to the Director General) to Board of Managers, 20 October 1960. This note mentions the Science Unit being 'under Archibald Clow'.

10 WAC R6.239/1, memo from Archibald Clow to Harman Grisewood, 12 October 1960 refers to the Science Correspondent as having been appointed 15 months earlier than the date of the memo, at which time the Science Unit already existed.

11 WAC R6.239/1, memo from Archie Clow to AOT(S) [Administrative Officer Talks (Sound), Mrs E Kilham Roberts], 22 September 1960.

12 Snow (1956).

published.[13] Snow's 1956 presentation of his cultural observations had a similar theme to Lutyens's 1945 article 'Ariel frustrated', discussed in Chapter 5: the gulf between the world of the humanities and the world of science. Unlike Lutyens, to whom he did not refer, Snow took a pro-science view. Whereas Lutyens lamented the influence of science and technology in the modern world, finding them morally deficient, Snow revelled in the expansiveness and confidence of the scientific world 'after its bout of Oppenheimerian self-criticism',[14] and claimed moral superiority for science. Snow implies that scientists' post-war embarrassment over the destructive potential of science had evaporated, and by 1956 scientists' recovery of self-esteem was complete.

Unlike Oliphant in the late 1940s, who had tried to unite culture and science (or, at any rate, pure science), Snow highlighted their separateness. Traditional culture, of the sort represented by Lutyens, was likened by Snow to '... a state whose power is rapidly declining – standing on its precarious dignity.'[15] On matters of social change, traditional culture stood for conservatism and self-interest according to Snow. These attitudes were revealed in a prevalent view in cultural circles that:

> Because man's condition is tragic, everyone ought to stay in their place, with mine [that is, the cultured person's], as it happens, somewhere near the top.[16]

Scientific culture, in contrast, was immune from the spirit of 'defeat, self-indulgence, and moral vanity' found among adherents of traditional culture.[17] Although scientists might accept that the individual human's condition was tragic, they did not admit that 'therefore the social condition must be tragic too.'[18] Scientists thus saw amelioration of society as part of science's function, and this gave science a distinctly moral dimension.[19]

Not only were scientists in the moral ascendancy, according to Snow, but also:

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13 Snow (1959).

14 Snow (1956), p. 413.

15 Snow (1956), p. 413.

16 Snow (1956), p. 414.

17 Snow (1956), p. 414.

18 Snow (1956), p. 414.

19 Snow (1956), p. 414.

> ... scientists are on the up and up; they have the strength of a social force behind them [ ] they belong to something more than a profession, to something more like a directing class of a new society. In a sense oddly divorced from politics, they are the new men.[20]

Certainly in terms of social policy, scientists had a good claim to be the 'new men' (and women). Government spending on scientific research grew from under £10m in 1939 to £220 in 1955–6, and subsequently to £425m in1964–5. Much of this was defence-related, associated with cold-war politics.[21]

The period 1955–6 marks something of a division in British postwar civil science policy. Economic conditions in Britain had improved, and the scientific and technological resources of the USSR and USA began to be fully recognised.[22] A key event here was the launch by the USSR of the Sputnik 1 artificial satellite on 4 October 1957. Governments or political parties in some countries began to formulate explicit science policies around this time. In the USA, which had no equivalent device to the Sputnik, there was anxiety that the USSR's space technology was superior to the USA's, and that, through space technology, the USSR might gain a military advantage. The launch of a second Sputnik satellite in November 1957 was described in the USA as 'a second Pearl Harbour'.[23] In the aftermath of Sputnik, several bodies were founded to represent science at high level in US administration: the President's Special Assistant for Science and Technology, the President's Science Advisory Committee, the Federal Council of Science and Technology, and the Office of Science and Technology.[24] In France, new policy bodies appeared relating science and technology to economic planning.[25] In Britain, both of the main parties pledged to appoint a Minister for Science in the 1959 election campaign.[26]

In addition to provoking shifts in governmental science policy, the events of 1957 gave a fillip to campaigns to increase the public understanding of science.[27] In the USA there appeared 'An Inexpensive Science Library', a list of recommended reading. Hilary J. Deason of the American Association for the Advancement of

20 Snow (1956), p. 413.

21 Vig (1968), p.2.

22 Vig (1968), p.15.

23 *The Times* (1957)

24 Vig (1968), p. 2.

25 Vig (1968), p. 2.

26 Vig (1968), p. 30–1.

27 Gregory and Miller (1998), pp.39–40.

Science wrote at the time: ‘Scientific literacy has become a real and urgent matter for the informed citizen.’[28] A former BBC science producer has described 1957 as ‘possibly the most important year there has been for global science, and for science broadcasting to the world.’[29]

[28] Deason (1964), p. vii. Quoted in Gregory and Miller (1998), p. 40.

[29] Redfern (2009), p.178.

HOME

330m. and 93.5Mc/s.

6.25 a.m., Market Report for Farmers. 6.30, News. 6.33, Orchestra. 6.55, Weather. 7, News. 7.10, Programme Parade. 7.15, To-day and Music. 7.50, Religious Talk. 7.55, Weather. 8, News. 8.10, Programme Parade. 8.15, To-day and Music. 9, News. 9.10, Letter from America. 9.25, Recital. 9.55, Schools. 10.15, Service. 10.30, Music While You Work. 11, Schools. 12, Midland Orchestra. 12.55, Weather.

1, News. 1.10, Desert Island Discs. 1.40, Schools. 3, Music While You Work. 3.30, The Brains Trust. 4.15, Encore. 5, Children's Hour. 5.55, Weather.

6, News. 6.15, Town and Country. 6.40, To-day's Sport. 6.45, Music Album. 7, Music to Remember. 8, Poppy of Remembrance. 8.30, The Goon Show. 9, News. 9.15, "The Giant Killer," play by Jean Morris. 10.30, Gieseking *(piano)*. 10.45, To-day in Parliament. 11, News. 11.8, Market Trends.

LIGHT

1,500m., 247m. and 89.1Mc/s.

6.45 a.m., Shipping Forecast. 7, Music. 9, Housewives' Choice. 9.55, Hymn and a Prayer. 10, Theatre Organ. 10.30, Music While You Work. 11, Story. 11.15, Mrs. Dale. 11.30, Alexander's Players. 12, Records. 12.30, Music-hall. 1, Dance Jamboree. 1.45, Listen with Mother. 2, Woman's Hour. 3, Music While You Work. 3.45, Hughes Septet. 4.30, Mrs. Dale. 4.45, Music All the Way 6, Delaney's Band. 6.45, The Archers. 7, Newsreel. 7.25, Sport. 7.30, "Henry Morgan, Buccaneer." 8, Hullo Mum! 8.30, News and Boxing. Peter Kidd (Aberdeen) v. Arthur McGregor (Middlesbrough). 9, Northern Variety. 9.30, Orchestra. 10.30, News. 10.40, Dance Orchestra. 11.55, News.

NETWORK THREE

464m., 194m. and 91.3Mc/s.

6.15 p.m., The Younger Generation. What's Your Pleasure? 6.45, For Collectors of Match-box Labels. 7, Parents and Children. If Your Son Goes to a University 7.30-7.45, Starting Spanish, 6—A Street in Madrid.

THIRD

464m., 194m., and 91.3 Mc/s.

8 p.m., Monteverdi's opera "Orfeo," sung in Italian. Recording. Prologue and Acts 1 and 2. 8.55, The Dumas Trinity; talk by Robert Baldick. 9.15, "Orfeo" (Acts 3, 4 and 5). 10.15, A Hairy Reptile; talk by Dr. W. W. Swinton. 10.35-11.5, Zara Nelsova ('cello). Suites by Bloch and Bach.

TELEVISION

1.45 p.m., Watch with Mother. 2, Schools Tuning Signal. 2.5, For the Schools. Science and the Weather. 2.30-3.15, Mainly for Women. 5, Children's Television. 6, News, Sports News and Weather. 6.15, To-night. 7, News. 7.5, Edmond O'Brien, in "Tower Room 14A," film-play. 7.30, This Is Your Life. 8, News. 8.2, Hancock's Half-hour. 8.30, Panorama. 9.15, International Amateur Skating. The Richmond Trophy. 9.45, Bernard Miles and "My Uncle Silas." 10, News. 10.15, Television Dancing Club. 10.45, Movie Museum. "Peck's Bad Boy," with Jackie Coogan. 11, News and Weather.

I.T.A.

ASSOCIATED REDIFFUSION

2.43 p.m., For Schools. "The Farming Year." 3.11, Intermission. 3.23, For Schools—repeat of 2.43 programme. 4.30, "Small Time." 4.45, "Seeing Sport" (Archery). 5.30, "Hopalong Cassidy." 6, Alan Taylor, "When Europe was the Centre of the World." 6.30, News and Weather. 6.44, "Television Beauty Salon." 7, "The Adventures of Sir Lancelot." 7.30, "Shadow Squad." 8, "Criss Cross Quiz." 8.30, "The Most Likely Girl." 9, "The Murder Bag." 9.30, Jack Hylton presents Reg Dixon and Sally Barnes, in "People Like Us." 10, "Gun Law." 10.30, Critical discussion on the Daily Press. 10.46, News and Weather. 11, Ellen Drew, in "The Governess." 11.30, Epilogue.

ASSOCIATED TELEVISION

Midland

12.43 p.m., Thought for the Day. 12.45-1.30, "Lunch Box." 2.43, For Schools—The Farming Year. 3.11, Intermission. 3.23-3.50, For Schools (repeat). 5, "Seeing Sport" (Archery). 5.30, Roy Rogers. 6, Alan Taylor on "When Europe was the Centre of the World." 6.30, News. 6.40, Midlands News. 6.45, Armand and Michaela Denis. 7, Abbott and Costello Show. 7.30, "Shadow Squad." 8, "Criss Cross Quiz." 8.30, Beryl Reid and Nocle Gordon, in "The Most Likely Girl." 9, "The Murder Bag." 9.30, Jack Hylton presents "People Like Us." 10, It's a Woman's World. 10.15, "Highway Patrol." 10.46, News. 11, Epilogue.

GRANADA

Northern

5 p.m., Seeing Sport. 5.30, "Rin-Tin-Tin." 6, Alan Taylor on "The Revolution of 1848." 6.30, News. 6.38, Northern News. 6.45, Armand and Michaela Denis. 7, "Wyatt Earp." 7.30, "Shadow Squad." 8, "Criss Cross Quiz." 8.30, Beryl Reid. 9, "Murder Bag." 9.30, Reg Dixon and Sally Barnes, in "People Like Us." 10, "The Millionaire. 10.30, What the Papers Say. 10.46, News. 11, "Wings of Danger." 11.30-12, The Count of Monte Cristo.

SCOTTISH TELEVISION

1 p.m., "The One O'clock Gang." 1.40-1.45, Scottish News. 2.43-3.50, Schools: The Farming Year. 5, Seeing Sport: Archery. 5.30, "Hopalong Cassidy." 6, Alan Taylor. 6.30, National News. 6.40, Scottish News. 6.45, "A Man About the House." 7, "The Bucaneers." 7.30, "Shadow Squad." 8, "Criss Cross Quiz." 8.30, "The Most Likely Girl." 9, "Murder Bag." 9.30, Jack Hylton presents. 10, Cross Current: "The Diplomat." 10.30, A Date with Kathie Kay. 10.45-11, National News

Figure 6.1 Broadcast schedule for Monday 4 November 1957 (the day after the second Sputnik was launched) from *The Times*, p. 4. There are now four BBC radio services, Home, Light, Third and Network Three. Network Three shared frequencies with the Third, and only operated when the Third was off air. Independent television is shown as separate regional companies. Transmission details for BBC radio services now show the use of frequencies in the range 89–94 Mc/s (MHz), associated with the use of very high frequency (VHF) bands for frequency-modulated (FM) transmissions

6.3 Fleck, Hinshelwood, Todd and Linstead

At the British Association for the Advancement of Science's annual meeting in August 1958, the Association's president, chemist Sir Alexander Fleck, mentioned in his Presidential Address a number of contemporary developments that he considered indicative of the special importance of science and technology in modern life: Russian and American artificial satellites, thermonuclear fusion experiments at Harwell and Aldermaston, rocketry, and the International Geophysical Year (which was 1957). He pointed out society's dependence on science, and, in particular, Britain's economic dependence on science and technology:

> We must concentrate for our own survival on the development of new products and new processes. We are obliged to rely either on selling things which no one else has yet learnt to make, or make as cheaply, or on marketing our skill and know how.[30]

Yet, he observed, where science and technology were concerned, 'it is sad to think how few people clearly understand what it is all about'.[31]

In September 1958, a few weeks after giving his Presidential Address, Fleck, together with two other chemists, Sir Cyril Hinshelwood (President of the Royal Society, and Nobel laureate for Chemistry in 1956) and Sir Alexander Todd (Chairman of the Advisory Council on Scientific Policy[32], and Nobel laureate for Chemistry in 1957), contacted the Director General of the BBC, Ian Jacob. The three scientists appear not to have been officially representing their respective organisations. No record of their exchange with the Director General has survived, but the major points, as summarised in a BBC memo six months later, were very much in line with those made by earlier scientific delegations:

> [they] wished to see science programmes increased in number and more closely coordinated. [...] They felt that this was necessary if science was to assume its rightful status in the BBC's output.[33]

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[30] WAC R6/239/1 paper from G. V. Allen, secretary of the British Association for the Advancement of Science, 13 December 1960.

[31] *The Times* (1958)

[32] WAC R6/239/1 Letter from Martin [Exec Secretary of the Royal Society] to R D'A Marriott, Assistant Director of Sound Broadcasting 15 October 1962 mentions the positions of Fleck, Hinshelwood and Todd at the time of the events described here. The British government's Advisory Council on Scientific Policy was established in February 1947. Its function was to advise the Lord President of the Council, who presided over meetings of the Privy Council (The Times, 1947). In practice, the Advisory Council proved ineffective. Its main difficulties were not with politicians but with the Civil Service, who resented a non-Civil Service body having such an apparently powerful position. It could not obtain satisfactory information on which to base its advice, and the advice it gave was largely ignored (Rose and Rose, 1969, p.74). The Advisory Council was abolished in 1964.

[33] WAC GAC228 General Advisory Council paper, 'Science Broadcasting', 2 April 1959, p.3.

The importance of science in the contemporary world was stressed:

> They made it clear that they were particularly concerned with the need to educate the mass of the public to an understanding of scientific developments and of the vital role of science in the contemporary world.[34]

Familiar themes are laid out here. The need for coordination and centralization of science production; the need for science to have a higher standing in the BBC's output; and the importance of science in the modern world cited as justification for these proposals. Relative to earlier interventions, though, what is missing is a formal route for external scientists to influence science programmes, either through the appointment of a scientist to manage a centralised science production unit, or the creation of a scientific advisory committee. In fact, the deputation envisaged a BBC staff member, 'preferably at top policy-making level', in charge of coordinated science production.[35] No indication of the background this manager should have was given, whether the world of broadcasting or science. At this stage the emphasis was on coordination, as it had been in the report of the Anderson subcommittee, which had led to the experimental appointment of Sir Henry Dale as Scientific Advisor in 1950. Nothing in the records indicates that this deputation knew it was treading on well trodden ground.

There is good reason to think that the issue of coordination was more significant in the later 1950s than at the time of earlier interventions. The expansion of broadcasting into television in the 1940s, and the development of the new Network Three in the 1950s, had certainly multiplied the areas of the BBC which could produce science programmes. In 1960, a couple of years after the Fleck–Hinshelwood–Todd delegation, a list of all the sources of science programming in the BBC ran as follows:

1 The Science Unit for Sound (under Archibald Clow)

2 Schools and Further Education science producers (of whom there were eleven) covering radio and television schools broadcasts

3 The Senior Science Producer in Television Talks (James McCloy)

4 Aubrey Singer in Television Outside Broadcast Department

5 B. Silcock in European talks

[34] WAC GAC228 General Advisory Council paper, 'Science Broadcasting', 2 April 1959, p.3.

[35] WAC R6/239/1 General Advisory Council Minutes of a meeting on 29 April 1959, Annexe on 'Science Broadcasting'. The point made in this paragraph was actually a clarification made by Hinshelwood in a subsequent discussion with the Director General.

6 The Science Correspondent in News (who had recently resigned)[36]

The BBC manager who compiled this list acknowledged that there was probably duplication of effort between these different production areas, and conceded that, in practice, there was little contact or collaboration between them. (The reason for the compilation of this list is given shortly.)

Of the three members of the Fleck–Hinshelwood–Todd delegation, Hinshelwood was also a member of the BBC's General Advisory Council. Like Oliphant a decade earlier, he therefore occupied a border or peripheral region in relation to the BBC, partly an insider and partly an outsider. He came to assume a more prominent role in discussions.

Seven months after the Fleck–Hinshelwood–Todd deputation's visit, in April 1959, Sir Hugh Linstead (also a member of BBC's General Advisory Council, like Hinshelwood), asked for a paper on science broadcasting to be presented at the next General Advisory Council meeting. What particularly exercised Linstead were:

> Scientific education and the publicising of the wide range of opportunities scientific careers offer.
>
> How to get over to the public the truth (apart from sensationalism) of recent scientific discoveries and claims.
>
> Making the public conscious of the great scientific problems of our times – population and food; water and soil conservation; nuclear energy; inter-stellar penetration and so on. The problems regarded as requiring a deliberate and planned presentation rather than piecemeal.[37]

The last proposal – calling for a systematic presentation of scientific topics rather than isolated programmes presenting a subject in a piecemeal way – almost exactly duplicated one of Crowther's 1926 proposals. It reflected the recurring scientific model for science broadcasts as akin to courses of university lectures.[38] Linstead commented at this meeting of the General Advisory Council that 'among all the BBC's advisory bodies there was not one concerned with science programmes.'[39]

[36] WAC R6/239/1, note from Harman Grisewood (Chief Assistant to the Director General) to Board of Managers, 20 October 1960. At the time of this note, the Science Correspondent in News had resigned, and there was uncertainty about whether the post would be retained.

[37] WAC GAC228 General Advisory Council paper 'Science Broadcasting', 2 April 1959, p.1.

[38] LaFollette (2008), p. 242 comments on a similar attitude in the USA: 'Unfortunately, many scientists appear to have perceived radio as more like a book or a formal lecture, than, say, a popular magazine...'

[39] WAC R6/239/1 General Advisory Council Minutes of a meeting on 29 April 1959, Annexe on 'Science Broadcasting'.

The result of the interventions by Fleck, Hinshelwood, Todd and Linstead was a paper prepared by BBC staff and presented to a meeting of the General Advisory Council on 29 April 1959.[40] The paper was entitled *Science Broadcasting* and with its appendices ran to seventeen pages. It was the BBC's longest statement of its philosophy of science broadcasting.

The authors of *Science Broadcasting* opened with a conciliatory gesture, declaring themselves 'in complete sympathy with the aims of the [Fleck–Hinshelwood–Todd] deputation', though which part of the deputation's proposals were meant is unclear.[41] Having sympathised with the deputation's aims, the authors then reported that internal investigations were afoot within the Corporation to improve liaison and coordination in science production. Although these 'internal investigations' are not elaborated, one of their outcomes, and possibly their only outcome, was a suggestion by the Director General that representatives of the various science-producing areas of the BBC should meet from time to time. The Director General hoped that in this way coordination could be improved 'without any organisational change'.[42] At Director General level, then, the BBC's strategy was one of sympathising with the aims of the interventionists while declining to change working practices or managerial structures (as with the Henry Dale experiment a decade earlier). Reviewing the position eighteen months later, the Chief Assistant to the Director General recorded that no coordinating meetings of the kind suggested by the Director General had been held.[43]

The *Science Broadcasting* paper set out the BBC's aims regarding science programming:

> ... broadly, to demonstrate as clearly and arrestingly as possible what science is doing, how it works – the application of scientific method to the solution of problems and the advancement of knowledge – and the relevance of its work to people's daily life and well-being.[44]

Satisfying this aim was constrained by practical limitations. The range of modern-day science was described as vast in relation to the time that the BBC could conceivably devote to it. Consequently, comprehensive coverage was impossible.

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[40]WAC General Advisory Council paper GAC228, 'Science Broadcasting', 2 April 1959.

[41] This declaration of sympathy recalls William Haley's declaration, ten years earlier, of his sympathy with Lawrence Bragg's proposals (see Chapter 5).

[42] WAC R6/239/1, note from Harman Grisewood [Chief Assistant to the Director General] to Board of Managers, 20 October 1960, records that the Director General had expressed this wish.

[43] WAC R6/239/1, note from Harman Grisewood [Chief Assistant to the Director General] to Board of Managers, 20 October 1960, records that no coordination meetings had taken place.

[44]WAC M2/8/5 General Advisory Council paper GAC228, 'Science Broadcasting', 2 April 1959, p. 1.

Furthermore, some areas of science were 'too abstruse' to be rendered intelligible to the layman, or were 'so specialised and remote from ordinary life as to be incapable of interesting him.' The approach therefore favoured relevance to the listener over intrinsic scientific importance. By implication, the authority to decide which areas of science were too abstruse and too specialised for the public lay with the BBC.

A new line of argument, not previously advanced, compared the relative suitabilities of radio and television for handling science:

> Sound broadcasting [...] must limit itself both in subject matter and in treatment to what can be communicated through the ear alone. Television, on the other hand, can combine explanation with demonstration and is thus a first-rate medium for science. The BBC has sought in its Television Service to exploit this great advantage. The amount of science broadcasting that the Television Service can carry is, however, limited by its present confinement to a single programme outlet. It is thought that the science outlet in television cannot be much increased unless and until the BBC is given a second television programme.[45]

This observation closely mirrors Hilda Matheson's response to J. G. Crowther in 1926 (see Chapter 3), in which she observed that a second radio channel would be required for there to be sufficient science broadcasting to justify the appointment of a specialist science manager. In fact by 1959 BBC managers had been lobbying government for the BBC to be allowed a second television channel for about five years; and a major part of the BBC's own submission to the Pilkington Committee in the early 1960s related to its ambitions for a second channel.[46] Invoking a second channel in the *Science Broadcasting* paper looks like a strategic move by the BBC to align pressure from scientific interventionists with the BBC's own pressure on government for a second television channel. Taken together with Matheson's response to Crowther thirty years earlier, this citing of a need for a second channel suggests a consistent position within the BBC. If science were to be treated as a broadcast specialism, as opposed to general fare, then it must be under conditions in which it was presented on a second channel, as an alternative to generalist material on the first channel.

The *Science Broadcasting* paper commented that science found its way into many kinds of programme, such as topical and magazine programmes, and general talks, discussions and features. This distribution of science across many types of

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45 WAC M2/8/5 General Advisory Council paper GAC228, 'Science Broadcasting', 2 April 1959, p. 1.

46 Briggs (1995c) pp. 22, 402, 403.

programme, the paper implied, was better served by the non-centralised production of science. The science producers' need to keep abreast of current developments by visiting conferences etc. was reiterated, as was the important place of scientific advice from authoritative sources. The conscientiousness and professionalism of the science producers was offered as a defence of the current system.

The remainder of the *Science Broadcasting* paper was given over to a lengthy survey of the many types of science programming on the BBC. The paper did not address the apparent motivation of the Fleck–Hinshelwood–Todd deputation, namely the need to 'educate the mass of the public to an understanding of scientific developments and of the vital role of science in the contemporary world.'[47]

The subsequent discussion of the paper at the General Advisory Council was inconclusive. Sir Solly Zuckerman pointed out that the national effort in education was focusing more and more on science, and wondered whether broadcasting was playing its part. Several speakers mentioned possibility of a science 'curriculum' for talks. This was the idea that scientific broadcasts should be in series where each talk built on the one before forming, essentially, a course of lessons. For example, one speaker wanted to see a 'planned curriculum of broadcasts covering the fields of physiology, biology and physics.'[48]

Responding, the Director General said that the BBC believed its task in relation to science broadcasting (outside Schools and Educational Broadcasting) was 'to interest the broad mass of the people constantly in science and scientific development, so that they came to regard it as a natural part of life.'[49] However, he did not favour a curriculum for science output in general broadcasting:

> Was it not better to avoid the suggestion, which a planned syllabus might tend to convey, that you were trying to educate people? And would not such a syllabus demand an inordinate amount of broadcasting time if it was to be covered properly.[50]

The Director General's reply showed a sense that science had an important place in the BBC's output, but there was no reason to privilege it, for example, by adopting a

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47 WAC GAC228 General Advisory Council paper, 'Science Broadcasting', 2 April 1959, p.3.

48 WAC R6/239/1 General Advisory Council Minutes of a meeting on 29 April 1959, Annexe on 'Science Broadcasting'. p. 3.

49 WAC R6/239/1 General Advisory Council Minutes of a meeting on 29 April 1959, Annexe on 'Science Broadcasting'. p. 5.

50 WAC R6/239/1 General Advisory Council Minutes of a meeting on 29 April 1959, Annexe on 'Science Broadcasting'. p. 5.

didactic approach.[51] Regarding the suggestion that a senior BBC official should be charged with keeping the whole of the Corporation's science broadcasting activities under review, the Director General thought it impractical for one person to keep track of all the Corporation's science output.[52]

This meeting of the General Advisory Council had little result. The assistant to the Director General conducted a survey of science production, and found that science production was happening in numerous parts of the BBC, as listed earlier. In the light of this, the Director General proposed occasional meetings of science production staff from the departments concerned.[53] His proposal had no effect.[54]

The interventions by Fleck, Hinshelwood, Todd and Linstead, and the BBC response to them, had much in common with earlier interventions. As far as the BBC was concerned, its commitment to science was acknowledged and affirmed by listing the many and varied science broadcasts it produced, some of them incorporated in generalist programming. There was no suggestion that the Corporation saw its role as the advancement of science, or the correction of the public's insufficient esteem for science. The response was to concentrate on broadcasting professionalism: the high standard of output; the concern not to overtax the listener or viewer; and maintenance of a balanced output. The response remained silent on the desirability of promoting a pro-science mentality in the audience.

These interventions in the late 1950s merged seamlessly into those associated with the Pilkington Committee in the early 1960s. However, before turning to the Pilkington Committee, it will is useful to look briefly at two public lectures relating to science delivered in 1959.

6.4 Snow and Ashby, 1959 lectures

C. P. Snow's 1956 article 'The Two Cultures' has already been discussed briefly. On 7 May 1959, an expanded version of the article was presented as the Rede Lecture at Cambridge University under the title *The Two Cultures and the Scientific Revolution*. The lecture retained the technocratic and elitist thrust of the 1956 article, presenting scientists as uniquely in tune with the problems of the modern world and their

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[51] WAC R6/239/1 General Advisory Council Minutes of a meeting on 29 April 1959, Annexe on 'Science Broadcasting'. p. 5.

[52] WAC R6/239/1 General Advisory Council Minutes of a meeting on 29 April 1959, Annexe on 'Science Broadcasting'. p. 5.

[53] WAC R6/239/1, note from Harman Grisewood [Chief Assistant to the Director General] to Board of Managers, 20 October 1960, records that the Director General had expressed this wish.

[54] WAC R6/239/1, note from Harman Grisewood [Chief Assistant to the Director General] to Board of Managers, 20 October 1960, records that no coordination meetings had taken place.

solutions. However, whereas the 1956 article had solely been concerned with the gulf between humanists and scientists, the greater part of the 1959 lecture related to the gulf between the wealthy nations of the world and the poor nations. According to Snow, wealthy countries were rich because they had embraced the 'scientific revolution', which consisted of applying science to industry. Poor countries had not yet adopted the scientific revolution, but it was only a matter of time before they did.[55] 'Industrialization is the only hope of the poor,' he said.[56]

A consequence of this rapid industrialisation in the undeveloped world, Snow said, would be a huge demand for scientists and engineers, many of whom would have to be supplied by developed countries.[57] The USSR was better placed than either the USA or Britain to supply such people, and would surely win the race unless the output of scientists in the UK and USA was increased.[58] The crux of Snow's 1959 lecture was thus not essentially about culture, but about education, and the need for more scientific and educational training.

A much less famous lecture than Snow's, given in the same year as Snow's, was Sir Eric Ashby's British Association Granada Lecture *Dons or Crooners?: Some Problems in the Popularization of Science*,[59] broadcast on ITV stations on 26 November 1959. In his lecture, the British biologist advanced a novel argument (in this context) for the popularization of science. Modern society, he said, had become increasingly fragmented. In earlier ages, social cohesion had been achieved through religion. Religion, however, no longer functioned as a social unifier, and only one activity could now achieve the same social effect. This was science. Its cohesive power lay in its universality. Its truths applied to everyone, no matter what their religion, race or creed: 'The one force of cohesion which is truly supra-national is our common faith in science.'[60] Here Ashby made a distinction between pure science

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55 Snow (1959), p. 40.

56 Snow (1959), p.24.

57 Snow (1959), p.45.

58 Snow (1959), p.45.

59 Ashby's lecture was the third of three British Association Granada Lectures given in the autumn of 1959. The preceding two lectures were given by physicist Sir Edward Appleton and American journalist and broadcaster Edward Murrow. Ashby's lecture was scheduled for 27 October 1959, but postponed to 26 November because of illness. (The Times, 1959a and b.) All three lectures were broadcast on ITV, and published in British Association (1959).

60 Ashby (1959), p. 90. Although this argument about the unifying power of science is new in the context of this thesis, Shapin and Schaffer (1985, pp.298–9) have shown that in Restoration England, advocates of experimental science, notably Robert Boyle and Robert Hooke, saw their confraternity of experimenters as a kind of ideal society where disputes could be resolved safely. This was recommended as an alternative to the tyranny, dogmatism and social strife that had characterised English life in the decades leading to the Restoration. In a similar vein, Kevles (2005, pp. 117–9) recounts how the bending of light passing a star, predicted in Einsteins' General Theory of Relativity, was tested by a party of British astronomers including Arthur Eddington and Frank

and applied science. Applied science was too often displayed to the public in the way mediaeval relics had been, with the intention of inspiring awe. The universality of science was to be seen in pure science – in the way scientists thought and acted, and in the laws they discovered. Ashby acknowledge that science popularisation sometimes cast scientists as modern-day priests, which was apt to result in undue deference towards scientific authority.[61] Done properly, though, popularization would not have this effect. Science had, in fact, set people free from 'the despotism of authority in intellectual matters.'[62] The correction of misapprehensions about science was to be a major function of popularization. The way science proceeds by a succession of failures, interspersed with creative moments of inspiration; the role of painstaking observation and craftsmanship; the battle with recalcitrant equipment. These would all be recurring themes of Ashby's favoured style of science popularization.[63] Thus whereas Snow implied that scientists had élite status, as the true moral arbiters of the modern age, Ashby implied that science, properly understood, would undermine the authority of the specialist.

6.5 Pilkington submissions, 1960–2

The next significant series of interventions was in the years leading to the Pilkington report, which was another of the broadcasting 'charter review' reports. These interventions culminated in submissions to the Pilkington committee by the Royal Society, the British Association, Kathleeen Lonsdale and the Department of Scientific and Industrial Research (DSIR).[64] This period of activity closely followed C. P. Snow's Rede Lecture on *The Two Cultures and the Scientific Revolution*, delivered on 7 May 1959, and discussed in the last section. Snow's lecture was cited in one of the British Association's submissions to the Pilkington Committee.

The Pilkington Committee was set up in July 1960. The context of the Committee's creations was one of 'moral panic' over the state of (especially) commercial television.[65] Commercial television companies had become highly profitable through popular quiz shows such as *Double your Money*, *Take your Pick* and *Beat the Clock*.

Dyson in 1919. The non-nationalistic spirit of the experiment was felt by many participants to demonstrate the power of science to reconcile countries that had recently been at war with each other.

61 Ashby (1959), p. 92.

62 Ashby (1959), p. 92.

63 Ashby (1959), pp. 104–11.

64 The DSIR was a Government body, founded in 1916, and intended to improve Britain's scientific and economic position. Its aims were to increase the supply of research workers (for instance by offering allowances and fellowships to postgraduate students), to encourage industrial research (for example, by offering subsidies), and to develop a network of state research establishments. (Vig, 1968, p. 11)

65 Milland (2004), p.79

The opprobrium attracted by these programmes was partly related to the extravagance of the prizes offered. In the eyes of critics, who could be found in all parts of the political spectrum, these prizes were disproportionate to the intellectual efforts or attainments required to win them.[66] Sections of the Conservative Government, which had ended the BBC's monopoly on broadcasting, were embarrassed by the apparent excesses of commercial television.[67] The Pilkington Committee, which the Conservative Government set up, was thus, through the choice of members, skewed strongly towards a public-service concept of broadcasting, and away from a rampantly commercial, unregulated model.[68] One issue it was expected to offer a recommendation on was a third television channel, and whether such a channel should be allocated to the BBC or ITA. Since 1958 government and broadcasters had known that frequencies could be found for a third television channel, and possibly even for a fourth.[69]

The Pilkington Committee was the first BBC Charter review committee to receive significant submissions relating to scientific broadcasting. They came from the Royal Society, the British Association for the Advancement of Science, the Department of Scientific and Industrial Research (DSIR), and Kathleen Lonsdale (Vice President of the Royal Society and General Secretary of the British Association). There was a good deal of overlap between all four submissions. In addition, the Royal Society's submission reiterated the points made by the Fleck–Hinshelwood–Todd deputation to the BBC in 1958, and indeed Fleck was on of the four authors of the Pilkington submission.[70] It is not clear whether the submissions were developed independently or together. Their very different styles and lengths, together with the only partial overlaps between the proposals, suggests a measure of independence in the authors of the submissions.

Table 6.1 summarises the proposals made in the submissions, who made them.

Table 6.1 Proposals in scientific submissions to Pilkington Committee

Proposal	Proposers
Appointment of a scientist to the BBC who would operate at policy and planning level within the BBC and be responsible for all science broadcasts	Royal Society, British Association, Kathleen Lonsdale, DSIR

66 Milland, (2004), pp.82 and 83

67 Milland (2004), p.88

68 Milland (2004), p.95

69 Milland (2004), p. 78

70 WAC R6/239/1, letter 15 October 1962 from D. C. Martin (Exec Secretary of the Royal Society) to R. D'A. Marriott, Assistant Director of Sound Broadcasting. Also WAC R6/239/1 memo from Head of Talks (sound) to ADSB, 14 Sept 1962. This memo names the authors of the Royal Society's submission as Sir Harrie Massey, Lord Fleck, Professor C. A. Waddington and Professor M. Abercrombie.

Expansion of science broadcasting	Royal Society, Kathleen Lonsdale, DSIR
More scientific production staff at BBC and ITA	DSIR, Kathleen Lonsdale
Science advisory council to advise the BBC	Royal Society, British Association
Non-formal committee of scientific advisers	DSIR
Greater coordination of science broadcasting	Royal Society, Kathleen Lonsdale
Third, non-specialist television channel	DSIR, Royal Society
Third television channel specialising in 'serious' output	British Association
More broadcasting on technology	DSIR
Conversion of some broadcasting studios to laboratories	Kathleen Lonsdale
Formulation of a policy on science broadcasting	British Association
Research into science presentation	British Association

There was an expectation in several proposals that the Independent Television Authority would take on part of the task of disseminating scientific knowledge. On the whole, though, submissions concentrated on the BBC.

All the proposals put forward were accompanied by justifications of greater or lesser elaboration. The Royal Society's and Kathleen Lonsdale's submissions were quite brief. The Royal Society paper merely observed that an increased presentation of science was desirable, so that science could take its rightful place in the broadcast output.[71] Lonsdale's stated rationale was that one section of the listening population was badly served by current science broadcasting, namely:

> those who are ignorant of even the language of science but who wish to be informed; or who wish to understand scientific methods of thinking and working; or who want to hear discussions of the possible social, economic and political consequences of everyday science.[72]

The submissions by the British Association and the DSIR, by contrast, were several pages long and give more sense of being motivated by grievances. The British Association paper, echoing Sir Alexander Fleck's 1958 Presidential Address to the British Association, pointed out that science had transformed society in the last 100 years, yet many adults were ignorant of what science was and how it achieved its results. Some people were afraid of science, and regarded scientists as irresponsible, uncultured materialists (presumably erroneously).[73] Economic necessity was also cited: the future of the country depended on a supply of high quality scientists and technologists. The other main argument was the cultural importance of science.

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[71] WAC R6/239/1 Royal Society, *Science and Broadcasting*, 13 December 1960.

[72] WAC R6/239, Kathleen Lonsdale, Memorandum: Evidence for the Pilkington Committee, 30 June 1961.

[73] WAC R6/239, British Association for the Advancement of Science, *Broadcasting and Science*, 13 December 1960/June 1961.

Science was ‘an essential component of the school curriculum for every boy and girl.’

The DSIR’s submission,[74] like the British Association’s, stressed the economic importance of science, but alone among the submissions also stressed the importance of technology and applied science. It was more critical of the BBC and the ITA than were the other submissions. The ITA was charged with devoting negligible time to science and technology, the BBC with devoting considerably less than was devoted to literature, classical music, art, drama, gardening, or nature study. (Implicitly, therefore, gardening or nature programmes were not regarded as scientific, suggesting that for the authors ‘science’ was synonymous with ‘professional science’.) The lack of high-level direction in the broadcasting of science was contrasted with religious broadcasting, drama and music, each of which had a Head.[75]

Possible objections to broadcasting more science and technology were anticipated by the authors of the DSIR submission. For instance, the document pointed out that the audience for classical music broadcasting was small, yet the BBC persisted in broadcasting this kind of music. To argue that there was an insufficient audience to justify more science and technology broadcasting would therefore be inconsistent with the BBC’s existing practice. However, the DSIR was not convinced that the audience for science was small:

> The fact that the BBC Overseas Services include technological matters is surely proof that people can be interested in the subject. Furthermore there is also a definite interest in what other people do for a living, and this interest could quite naturally be exploited in programmes on technology.[76]

The submission suggested incorporating science and technology into general interest broadcasts, such as the BBC radio series *The Archers* and *Any Questions?,* and the ITV series *Emergency – Ward 10*. Production staff’s competence to deal with science was questioned:

> With certain notable exceptions, producers dealing with scientific and technological matters show weakness in their handling of the subjects.

[74]WAC R6/239/1 Memorandum from the Information Division of the Department of Scientific and Industrial Research to the Committee on Broadcasting, August 1961 (DSIR, 1961).

[75] Subsequently the DSIR’s analogy between a Head of Science and the existing Head of Drama was taken as indicative of the DSIR’s ignorance of the way the BBC was organised. The Head of Drama did not perform the role the DSIR’s submission claimed, and did not offer a model for what was expected of a Head of Science. WAC R1/99/1 Board of Governors Papers 1963, 1–20.

[76]WAC R6/239/1 Memorandum from the Information Division of the Department of Scientific and Industrial Research to the Committee on Broadcasting, August 1961 (DSIR, 1961).

> Although programmes on other subjects, such as art, music, current affairs and the like, are produced by men and women with a thorough knowledge of the subject, science programmes are often given to producers with no knowledge of science.[77]

Possibly the producers of the submission were unaware that the two leading producers of radio science, Archibald Clow and David Edge, were scientists.

The British Association's submission specifically referred to Snow's 1959 Rede lecture on *The Two Cultures*, and declared that 'it is essential that the gulf [between the two cultures] be bridged.'[78] The submission referred to the importance of science in everyone's life and said that science's importance would grow. From this flowed a need for a greater public understanding of science, and hence an obligation on the BBC to foster the popular understanding of science.

The DSIR's lengthy submission received a point-by-point rebuttal from the BBC in an internal document, including the following:

> We disagree entirely that too much attention is paid to audience figures... We do not think it would be right to exploit a programme like *The Archers* for conveying scientific information other than that with an agricultural interest.... In our view it would be very dangerous to include scientific questions in a programme like *Any Questions?* The assumption of DSIR is that the questions asked in this programme are not genuinely and spontaneously obtained from the audience present....[79]

The BBC's response exposes the different attitudes towards programme making between the broadcasters and the scientists. For the BBC, *Any Questions?* is defended in terms of its spontaneity and the genuineness of its questions. These are distinctive features of the programme. To suggest using it as a vehicle for science would, for the BBC staff authors of this response, compromise the programme's essential nature. Characteristically, the issue is assessed in relation to professional broadcasting considerations. The major premise of the DSIR submission, that both the BBC and the independent companies should devote more time to science and technology 'in the national interest', received no comment.

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[77] WAC R6/239/1 Memorandum from the Information Division of the Department of Scientific and Industrial Research to the Committee on Broadcasting, August 1961 (DSIR, 1961).

[78] British Association for the Advancement of Science (1961).

[79] WAC R6/239/1 'Science Broadcasts', head of Talks & Current Affairs to A. D. S. B., 14 November 1962.

One of the questions the Pilkington Committee had to consider was the form a new, third television channel might take. Suggestions for the channel came from the scientific bodies. None suggested that the new channel should be specially devoted to science. The British Association proposed that it be devoted to intellectual matters of all kinds. The DSIR and Royal Society made no recommendation about the third channel, other than to say that science should remain in a channel that does general (that is, non-specialist) broadcasting.

While the Pilkington committee was taking evidence and preparing its report, Sir Lawrence Bragg suggested to the Director General of the BBC the holding of a twice-yearly conference between scientists and BBC science producers. Bragg considered it would be helpful for both parties.[80] For the scientists, it might help as a way to give 'some form of training', and for the producers it might help 'overcome a competitive feeling which [Bragg] felt existed among producers'.[81] This proposal was forwarded to producer Archibald Clow, who considered the suggestion that producers were competitive to be extraordinary. Nevertheless in 1960 Clow had said that his Science Unit represented 'BBC Science' outside the Corporation, suggesting that if he was not competitive he was at least careful that people appreciated the standing of his unit.[82] As for meeting scientists, Clow said that he and his colleagues already did their best to keep contacts alive by attending conferences and public events.[83] Regarding training for scientists in broadcasting technique, although he and his colleagues did occasionally run training sessions for groups of scientists, the most productive sessions were one-to-one interactions between producer and broadcaster. Clow rounded off his response:

> To sum up; while not in principle opposed to a conference, we are somewhat sceptical about its value. Recently, at my suggestion it happens, Sir Lawrence was invited to address the Annual conference arranged by Features Department but it became abundantly evident that he had thought very little about our problems and had few helpful suggestions to make. Like so many others of his class, he confessed that he had very little time for listening or looking.[84]

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[80] WAC R6/239, Board of Management Minute of 30 Oct 1961.

[81] WAC R6/239, Board of Management Minute of 30 Oct 1961.

[82] WAC R6/239/1, memo from A. Clow to H. J. G. Grisewood, 12 October 1960.

[83] WAC R6/239, Memo 23 November 1961 from Clow to Head of Talks (Sound).

[84] WAC R6/239, Memo 23 November 1961 from Clow to Head of Talks (Sound).

Clow's reference here to 'our problems' and to the paucity of useful suggestions from Bragg highlights the distinctly different considerations of the broadcasting professional and the scientist regarding the production of science broadcasts. For Clow, the problems of the professional broadcaster were of a special kind, and particular to the broadcasting profession. They were not understood by the scientist.

No more was heard of the conference idea, but the Board of Management of the BBC came round to the idea of a consultative arrangement between the BBC, the Royal Society and 'the University Scientists'.[85] Events overtook these developments, however, with the publication of the Pilkington report in the summer of 1962.

6.6 Pilkington Report (1962) and after

The report of the Pilkington Committee was published towards the end of June 1962.[86] In addition to recommending the renewal of the BBC charter and of licence fee funding, its major recommendations were:

> a 'third' television channel, to be allocated to the BBC
>
> wholesale restructuring of commercial television in which programme planning and selling of advertising would be taken from the individual companies and allocated to the ITA (Independent Television Authority).[87]

Other recommendations were the adoption of a 625-line standard for television, the adoption of colour television, and the introduction of local radio broadcasting by the BBC.[88]

Pilkington's recommendation that the third television be allocated to the BBC was accepted; it became BBC2. The recommendation for wholesale restructuring of commercial television was rejected.[89] Subsequently, the Government introduced less radical legislation to alter the structure of commercial television.[90]

Concerning science broadcasting itself, there were no recommendations in the Pilkington report, but paragraphs 325 and 326 mentioned the submissions by the British Association, DSIR and Royal Society, and asked the broadcasting bodies (not

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85 WAC R6/239, Board of Management Minute 23 July 1962. What is meant by the 'University scientists' is not elaborated, and might refer to unrecorded discussions.

86 Pilkington (1962)

87 The Times (1962), p. 12

88 The Times (1962), p. 12

89 Briggs (1995c), pp.303–8.

90 Briggs (1995c), pp.303–8.

just the BBC) to consider again the requests in these submissions for more scientific output, for senior scientists to be involved in planning, and for a scientific Advisory Committee.[91]

Referring the science submissions back to the BBC was a crucial move. The Pilkington Committee was asking the broadcasters to assess their own practice, in the manner of the paradigmatic professions of law and medicine. The committee was also respecting, as far as science broadcasting was concerned, the autonomy of the broadcaster. A useful contrast can be made with the Pilkington Committee's major recommendations (summarised above), which were directed at Parliament rather than at the broadcasters. Recommendations directed at Parliament entered the arena of national policy. The Pilkington Committee, by implication, did not regard science broadcasting as a matter of national policy, to be decided at government level.

As the scientific submissions were referred back to the BBC, BBC managers set about them as a matter of professional expertise. Even the way the issue was phrased within the BBC was indicative of the broadcasting professionalism that was brought to bear on the issue. The matter was referred to internally as 'Clearing up this recurrent problem of satisfying the scientific world about what is loosely called the co-ordination of science broadcasts.'[92] Describing the issue even loosely as 'the co-ordination of scientific broadcasts' re-framed it, through colligation, as an internal problem of programme planning – a question of professional expertise – and left out of the frame the special status that was being claimed by scientists for science. The recognition that the problem was 'recurrent' shows the broadcasters' institutional memory at work. Archival documents relating to earlier interventions were retrieved and consulted during the following deliberations.[93]

The task of clearing up the controversy fell to R. D'A. Marriott, Assistant Director of Sound Broadcasting, and Stuart Hood, Controller of Programmes, Television. They were deputed to write a report for the Board of Governors. The Director General acknowledged that resolving the issue might require a particular concession:

> ... one of the prices we might have to pay for a satisfactory settlement would be to arrange for some kind of a meeting of a committee of scientists, preferably of an informal and irregular nature.[94]

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[91] Pilkington (1962)

[92] WAC R6/239, memo from Assistant Director of Sound Broadcasting (R. D'A Marriott) to head of Talks (Sound), 9 August 1962.

[93] WAC R6/239, memo from Assistant Director of Sound Broadcasting (R. D'A Marriott) to head of Talks (Sound), 9 August 1962, refers to the Henry Dale report and Mary Somerville's comments being consulted.

In acknowledging that this concession might be needed, the Director General in effect pointed a way out. He indicated the kind of concession that would be found tolerable to senior management of the BBC. What the scientists actually sought – that the BBC take as a mission the reorientation of society towards science – was implicitly excluded.

Marriott and Hood held meetings with members of the Royal Society, British Association and DSIR. The purpose of these meetings was to explore the grievances of these bodies, and, as in so many other interventions, to point out the extent of the BBC's science output. Marriott took the opportunity to correct a misapprehension of the Royal Society that the BBC's Head of Drama was a high-level advocate of drama within the organisation, and therefore a suitable model for a Head of Science. The Head of Drama was not responsible for all the BBC's dramatic productions, and had no control over drama output to schools, over topical items concerned with the theatre, over drama items in news and current affairs, or over the External Services. 'Indeed, in an organisation like ours, a single Head of Drama attempting to cover all these fields would be bound to create a bottleneck,' Marriott wrote.[95]

The Royal Society's submission had singled out the Third Programme for its neglect of science. The Controller of the Third Programme was drawn into discussions, and defended the Third's science output in the usual way, by drawing attention to the track-record of science output:

> In the first three quarters of this year 34 science broadcasts were initiated (this includes 4 sociological talks) as compared with 40 current affairs talks, 38 literary talks and 37 philosophical talks of which 3 were discussions between scientists and philosophers.[...] The Royal Society memorandum gives me the impression that they are unaware of just how much science broadcasting is in fact done in the Third Programme.[96]

Furthermore, all the science broadcasts on the Third had repeats. As with the Oliphant letter in 1949, the amount of scientific broadcasting, at least on the Third Programme, appears not to have been researched by the BBC's critics.

A joint meeting with representatives of the Royal Society, the British Association and the BBC was held on 12 December 1962.[97] The scientific representatives

[94]WAC R6/239, memo from Assistant Director of Sound Broadcasting (R. D'A Marriott) to head of Talks (Sound), 9 August 1962

[95] WAC R6/239/a, Letter from Marriott to D. C. Martin at Royal Society, 23 October 1962.

[96] WAC R6/239/1, memo from Controller Third [P H Newby] to ADSB, 29 October 1962.

[97] WAC R6/239/1, notes of a meeting held at Burlington House 12 December 1962.

stressed that they were not critical of the content of science programmes produced by the BBC. The problem was an insufficiency of science broadcasts, given the importance of science, and a lack of overall policy in science programming.[98] BBC representatives cited their own professional expertise as the basis on which they decided the appropriate amount of science to broadcast:

> We explained how the total balance of programmes was based on the process of long experience and reminded them of the risk of boring and irritating the public by giving them too much of any one subject merely because it was thought right to do so.[99]

However, the question of policy was the one that most exercised the scientists. Sir Eric Ashby (President of the British Association, and presenter of the 1959 British Association Granada lecture referred to earlier) compared unfavourably the range of topics dealt with in *Science Survey* (a weekly magazine programme on the Third Programme) with the systematic planned and 'articulated' teaching given in language lessons.[100]

The BBC representatives pointed out that there was a distinction between programmes like *Science Survey,* which were intended for the general public, and educational series such as the language courses, which were presented by Schools and Further Education for a different type of audience. This distinction was one the scientists were reluctant to accept, and the BBC report of the meeting records that the scientists thought of the BBC 'much more as an educational instrument than as a general broadcasting service.'[101]

Sir Harrie Massey (a mathematical physicist, and one of the four authors of the Royal Society's submission)[102] objected to the Third's presentation of scientific controversy:

> Third Programme science broadcasts dealt only with those speculative areas where scientists themselves were in dispute or where the validity of

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98 WAC R6/239/1, notes of a meeting held at Burlington House 12 December 1962. The scientists had calculated (from BBC data) that about 5% of radio and 6% of television output were devoted to science.

99 WAC R6/239/1, notes of a meeting held at Burlington House 12 December 1962.

100 WAC R6/239/1, notes of a meeting held at Burlington House 12 December 1962.

101 WAC R6/239/1, notes of a meeting held at Burlington House 12 December 1962.

102 WAC R6/239/1 memo from Head of Talks (sound) to ADSB, 14 Sept 1962.

> certain scientific concepts could be challenged, instead of informing people about the more important practical scientific achievements. [103]

Massey here did not acknowledge the probing, critical function of the Third programme, and implies that the BBC had a duty to promote orthodox science, in which scientific findings were practical and uncontroversial, rather than debatable or open-ended. This is in line with Edgerton's identification of a 'vulgar assumption' which many scientists encouraged that science is unitary.[104] It also recalls Reith's concern that factions within outside groups would try, through the BBC, to present themselves as speaking for the whole group, rather than a faction.

The scientific representatives reiterated their Pilkington recommendations that there should be a scientist at senior managerial level within the BBC, and that there should be a scientific advisory committee.[105] The BBC pointed out that simply as a practical matter a single high-level scientist could not oversee both radio and television broadcasting, so that a practical implementation of the scientists' request would entail two high-level scientists (just as radio and television had parallel posts for most managerial positions). Any such scientific managers could have no effect, the BBC representatives pointed out, unless powers were ceded to them which were currently held by other managers, including the Controllers of Programmes, Television and Third Programme. This, they said, was not practical, though in what way it was impractical was not elaborated. What was at issue was the removal of authority from senior BBC managers and its transference to a scientific manager. In relation to the broadcasting profession, it would be a loss of jurisdiction. Nevertheless, the impracticality argument carried some weight. BBC representatives reported that:

> Although we could not give the BBC's final answer, we left them [the scientific representatives] in no doubt that in the opinion of the four of us, from our practical knowledge of broadcasting, their proposition was not a viable one. At the end of the discussion, Lord Fleck insisted that they would not yield on their claim but this was said in a partly jocular tone and it seems likely that we have made a considerable dent in their confidence.[106]

[103] WAC R6/239/1, notes of a meeting held at Burlington House 12 December 1962.

[104] Edgerton (2006a), p.195.

[105] WAC R6/239/1, notes of a meeting held at Burlington House 12 December 1962.

[106] WAC R6/239, notes of a meeting held at Burlington House 12 December 1962.

Regarding the proposal for a scientific advisory committee, there was a possibility for compromise:

> We made it clear that we regarded this proposal [a scientific advisory committee] as being of a different order from the proposal for a senior science post in that it was certainly not impracticable. We had no objection in principle to the formation of a Committee; our only concern was that if it were to exist it should be useful and should help in the making of good science programmes, and we thought that the BBC would prefer to avoid creating another formally constituted advisory committee.[107]

For the BBC managers, then, an advisory committee might help in the pursuing of the professional practices, and for that reason might be acceptable.

The end result of these post-Pilkington reviews of the scientific submissions was a short report and recommendation produced by Marriott and Hood. It was submitted to the Board of Governors on 14 January 1963.[108] Whereas with earlier interventions we have little in the way of a BBC response on the substantial points made by the interventionists, in this case the points are addressed more or less directly. Marriott and Hood pointed out, regarding the scientists and organisations who made submissions to the Pilkington Committee, that:

> ... these are specialists arguing for their own subject, and most specialists believe that their own subject is under represented.[109]

Regarding the criticism that there was no coordination of science broadcasts, Marriott and Hood pointed out that science was treated no differently from any other subject within the BBC:

> Nor is there [coordination] for literature, history, art, drama, sport or any other subject. It seems to us that to demand that there should be is to ignore the nature of a general broadcasting service, to treat it as if it were an educational institution, and to seek to apply to the whole of such a service criteria which are relevant only to sections of it, such as Schools Broadcasts or Further Education.[110]

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[107] WAC R6/239, notes of a meeting held at Burlington House 12 December 1962.

[108] WAC R1/99/1 Board of Governors Papers 1963, 1-20. R. d'A. Marriott and S. Hood, 'Science Broadcasting', 14 Jan 1963.

[109] WAC R1/99/1 Board of Governors Papers 1963, 1-20. R. d'A. Marriott and S. Hood, 'Science Broadcasting', 14 Jan 1963.

[110] WAC R1/99/1 Board of Governors Papers 1963, 1-20. R. d'A. Marriott and S. Hood, 'Science Broadcasting', 14 Jan 1963.

Marriott and Hood's comparison with the treatment of other subjects sets science on the same level as those other subjects, and implicitly ignores any reason to treat science differently. The repeated contention of the scientists, though, was precisely that science *was* different from other subjects, and because of its unique importance merited unique treatment. In this sense Marriott and Hood did not explicitly address a major premise of the interventions.

The proposal for a high level scientist or scientists to be appointed was, according to Marriott and Hood:

> wholly impracticable and should be firmly resisted. Even if the criticisms were accepted and our aim were to increase the time allotted to sound [*sic*: science?] and to formulate a science policy the existence of such posts would do nothing to help towards this end, and they could only really function by taking over responsibilities from those who must necessarily be senior to them.[111]

The idea of an advisory committee, however, was at least viable:

> The suggestion of an advisory committee is...not impracticable. We doubt whether it will greatly assist in the planning and production of better programmes but we think it not unreasonable to give it a fair trial.[112]

The Director General accepted the implications of Hood and Marriott's report, and an advisory committee, under the name of the Science Consultative Group, was established, initially for an experimental period of two years.[113] A BBC memo referred to the establishment of this Group as:

> ... a 'way out' after we had been pressed by the Royal Society and the B. A. to appoint a head of Science Broadcasting.[114]

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111 WAC R1/99/1 Board of Governors Papers 1963, 1-20. R. d'A. Marriott and S. Hood, 'Science Broadcasting', 14 Jan 1963.

112 WAC R1/99/1 Board of Governors Papers 1963, 1-20. R. d'A. Marriott and S. Hood, 'Science Broadcasting', 14 Jan 1963. In Chapter 2 of this thesis one of the authors of this report, Stuart Hood is quoted from elsewhere as dismissing advisory committees as 'not a reflection of public taste so much as a constant stream of pressures – generally from some section or some sub-section of the Establishment...Like all amateurs, they are prolific in advice to professional programme makers, who require a high degree of patience when listening to and then rejecting programme ideas any trainee director would know to be boring or impossible.' (Paulu, 1981, p.140)

113 WAC R6/239/3, memo from R. D. Pendlebury to BBC Heads and Controllers, 1 October 1965,

114 WAC R6/239/3, memo from R.D. Pendlebury (BBC staff) to C.P. Tel., 25 April 1965.

TELEVISION

B.B.C.1 (Ch. 1)

9.40-11.55 a.m., Schools. 1.5 p.m. (Crystal Palace, Sutton Coldfield, Holme Moss) Heddiw. 1.25, News. 1.30-1.45, Watch with Mother. 2.5-2.25, Television Club. 5.10, Deputy Dawg. 5.35, Fascinating Facts. 6, News. 6.10, Town and Around. 6.35, Fleet Air Arm Review. 7, Tonight. 7.35, Dick Van Dyke Show. 8, The Defenders. 8.50, International Swimming and Diving: Great Britain v. Holland. 9.15, News. Memorials to Kennedy: a television tribute by Satellite relay. 10, Marriage Lines. 10.25, Old-Time Music-Hall. 11.15, Points of View. 11.20, Guitar Recital. 11.35, News Extra. 11.45, Weather.

B.B.C.2 (Ch. 33)

11-11.30 a.m., Play School. 7.20 p.m., Line-Up for Friday and news. 7.30, Story Parade: The Man Who Won the Pools. 8.50, Arrest and Trial. 10.5, Newsroom. 10.30, Look at tomorrow.

ASSOCIATED TELEVISION (CH. 8) Midland

2.35-3.46 p.m., London. 4.30, Hi-T ! 5, London 5.25, Richard the Lionheart. 5.55, News. 6.5, Midlands News. 6.15, London. 8, Bonanza. 8.55, News. 9.10, The Odd Man. 10.10, London. 10.40, One Step Beyond. 11.5, Naked City; Weather. 12, Epilogue.

CHANNEL (CH.8)

2.35 p.m., London. 4.40, Puffin's Birthday Greetings 4.45, London. 6.5, Channel News and Weather. 6.15, Lassie. 6.45, Pop and Leslie. 7, London. 11.25, The Flying Doctor. 11.50, French News; Weather.

REDIFFUSION (Ch. 9) LONDON

2.35-3.41 p.m., Schools. 4.45, Small Time. 5, Five O'Clock Club. 5.25, Quick Draw McGraw. 5.55, News. Weekend Weather. 6.10, Ready, Steady, Go ! 7, Take Your Pick. 7.30, Emergency—Ward 10. 8, Burke's Law. 8.55, News. 9.10, The Odd Man. 10.10, Putting on the Donegan. 10.40, News. 10.42, Roving Report. 11.7, Dateline Westminster. 11.25, This Wonderful World. 11.55, Last Programme.

GRANADA (CH. 9 and 10) Northern

2.35 p.m., London. 5.25, The Terrible Ten. 5.55, News. 6.5, Beverly Hillbillies. 6.30, Scene at 6.30. 7, London. 8, Bonanza. 8.55, News. 9.10, The Odd Man. 10.10, London. 10.40, Ready, Steady, Go ! 11.25, News; Northern News. 11.35-12, Man from Interpol.

ANGLIA (CH. 11)

2.33-3.41 p.m., London. 4.45, London. 5.25, The Junior Angle Club. 5.55, News. 6.5, About Anglia. 6.45, Kenneth Robinson Reports. 7, London. 8, Bonanza. 8.55, News. 9.10, The Odd Man. 10.10, London. 10.40, Ready, Steady, Go ! 11.25, News. 11.27, Anglia News: Weather. 11.30, Roving Report. 11.53, Epilogue.

SOUTHERN TELEVISION (CH. 10 and 11)

2.35-3.40 p.m., London. 4.45, London. 6.5, Day by Day. 6.40, London. 11.25, Lawman. 11.50, Weather.

SOUTH WALES AND WEST OF ENGLAND(CH.10)

2.35-3.45 p.m., London. 4.20, Newyddion y Dydd. 4.25, Tregampau. 5, London. 5.25, Fireball XL-5. 5.55, News. 6.5, TWW Reports. 6.13, Car 54, Where Are You ? 6.40, Here Today. 7, London. 8, Bonanza. 8.55, News. 9.10, The Odd Man. 10.10, In the News. 10.40, Ready, Steady, Go ! 11.30, Mahalia Jackson. 11.35, Wisdom. 12, Weather.

WALES—WEST AND NORTH (CH. 8 and 10)

2.35-3.45 p.m., London. 5, London. 5.25, Fireball XL-5. 5.55, News. 6.6, Newyddion y Dydd. 6.12, Tregampau. 6.44, Pursuit of Happiness. 7, London. 8, Bonanza. 8.55, News. 9.10, The Odd Man. 10.10, In the News. 10.40, Ready, Steady, Go ! 11.30, Mahalia Jackson. 11.35, Wisdom.

WESTWARD (CH. 9 and 12)

2.35-3.41 p.m., London. 4.45, Westward News Headlines. 4.48, Gus Honeybun's Playtime. 5, London. 5.25, Sword of Freedom. 5.55, News. 6.5, Westward Diary. 6.45, Pop and Leslie. 7, London. 8, Burke's Law. 8.55, London. 11.27, True. 11.50, Weather. 11.51-11.56, Faith for Life.

GRAMPIAN (CH. 9 and 12)

2.33-3.41 p.m., London. 4.30, The Romper Room. 5, London. 5.54, Weather. 5.55, News. 6.6, Grampian News. 6.10, Grampian Week. 6.45, Sportscope. 7, London. 8, The Fugitive. 8.55, London. 11.8, Casebook. 11.35, Wea rt. 11.37, Prayers.

BORDER (CH. 11 and 13)

4.35 p.m., Anniversary. 4.45, London. 5.25, Robin Hood. 5.55, News. 6.6, Border News and Weather. 6.15, Lookaround. 6.30, London. 11.7, Road Across the Tamar. 11.19-11.22, Border News. Weather.

TYNE TEES (CH. 8)

2.35-3.40 p.m., London. 5, London. 5.25, High Road. 5.55, News. 6.5, North East Newsview. 6.45, Front Page Debate. 7, London. 8, Desilu Mystery Theatre. 8.55, London. 10.10, Home on Friday. 10.40, News. 10.42, North East News Headlines. 10.45, Ready Steady Go. 11.35, Epilogue.

SCOTTISH TELEVISION (CH. 10)

1 p.m., The One O'Clock Gang. 1.30-1.35, Scottish News. 2.35-3.41, London. 5, Supercar. 5.25, My Friend Flicka. 5.55, News. 6.5, Scottish News. 6.15, This and That. 6.30, Dateline: Scotland. 7, London. 9.10, Sergeant Cork. 10.10, London. 10.40, Ready, Steady, Go ! 11.25, News. 11.27, Man with a Camera. 11.57-12.2, Late Call.

ULSTER (CH. 8 and 9)

2.35-3.41, London. 4.40, Ulster News. 4.45, London. 5.25, Supercar. 5.54, Weather. 5.55, News. 6.6, Ulster News. 6.15, Parade. 6.58, Ulster News. 7, London. 8, Bus Stop. 8.55, News. 9.10, London. 10.40, Ready, Steady, Go ! 11.25, Headlines. 11.27, Loretta Young Show.

SOUND

HOME (330m. and 93.5Mc/s)

6.40 a.m., Farm Bulletin. 6.50, Lift Up Your Hearts. 6.55, Weather. Programme News. 7, News. 7.10, South-East News. 7.15, Today. 7.45, Today's Papers. 7.50, Lift Up Your Hearts. 7.55, Weather. Programme News. 8, News. 8.10, South-East News. 8.15, Today. 8.40, Today's Papers. 8.45, A Probation Officer. 9, News. 9.5, For Schools. 9.28, English and German Songs. 9.55, For Schools. 10.15, Service. 10.30, Schools. 10.50, Interlude. 11, For Schools. 12, A Wandering Welshman. 12.15 p.m., Any Answers ? 12.45, Announcements. 12.55, Weather. Programme News.

1, News. 1.10, Pick of the Week. 2, For Schools. 3, Orchestral Concert. 4, Spring in Glen Shee. 4.15, Medical Detectives. 4.45, Home this Afternoon. 5.25, Under Two Flags. 5.55, Weather. Programme News.

6, News. 6.10, South-East News. 6.32, Stock Market Report. 6.35, Music 7, Operatic Heroines. 7.30, Dancing and Music. 8, Orchestal Concert. 8.35, Interval Talk: The Word and the Deed. 8.55, Concert (Part 2). 10, News and Comment. 10.30, News-Stand. 10.45, Piano Recital. 10.59, Weather 11, News. 11.2, Leopards and Lilies. 11.15-11.47, Music.

LIGHT (1,500m., 247m. and 89.1Mc/s)

6.30 a.m., Weather; News: Bright and Early. 7, Music. 8.55, Metcast. 9, Housewives' Choice. 9.55, How the Good News spread. 10, Val Doonican. 10.31, Music While You Work. 11, Story. 11.15, The Dales. 11.31, Movietime. 12, Twelve O'clock Spin. 12.31 p.m., The Joe Loss Pop Show. 1.30, News. 1.35, Cricket Scoreboard. 1.45, Listen With Mother. 2, Woman's Hour. 3, Theatre Organ. 3.31, Music While You Work. 4.15, The Dales. 4.31, Racing Results and Cricket Scoreboard. 4.35, Playtime. 5, Roundabout. 6.33, Sports Review. 6.45, The Archers. 7, News and Radio Newsreel. 7.25, Sport. 7.31, How's Your Father ? 8, Alfred Marks Show 8.30, News and Tonight's Topic. 8.40, Any Questions ? 9.30, Friday Night is Music Night. 10.31, Racing Results. 10.32, Music. 11.55-12, News.

THIRD NETWORK (464m., 194m. and 91.3Mc/s)

6.30 p.m., Study Session. German for Beginners. 6.50, Masters of Arts: discussion 7.30-8, Motoring and the Motorist.

THIRD (464m., 194m., and 91.3Mc/s)

8 p.m., Germany After Adenauer: No. 6, The Next Generation. 8.45, The Death of the Jelly Baby, play. 10.5, Music by Berlioz. 10.40, A Lost Literature: talk. 11, News. 11.15-11.20, Market Trends.

Broadcast schedule for Friday 29 May 1964, from *The Times*, p. 16. This was the date of the first meeting of the Science Consultative Group. Television now dominates the schedules, and information about radio programmes is cursory. The BBC has two television channels, BBC 1 and BBC2. Commercial television has a plethora of regional variations, produced by regionally based television companies

6.7 The Science Consultative Group

The first chairman of the Science Consultative Group was Professor Alex Haddow, a leading cancer researcher. The Royal Society and the British Association were invited to suggest members. The first cohort of members included Sir Lawrence Bragg, Professor Herman Bondi, Professor D. V. Glass, Dr J. C. Kendrew, Sir Patrick Linstead, Professor M. M. Swann, and Mr Hugh Tett.[115] (For their affiliations, see footnote.) The British Association, Royal Society and DSIR were invited to nominate members.[116] This was different from normal practice with advisory councils, where members were selected by the BBC.[117] None of the scientists directly connected with the Pilkington submissions was among the membership of the Group.

The first meeting of the Science Consultative Committee was on 29 May 1964. A survey of the minutes of the Group shows that, as predicted by Hood and Marriott, it had little direct effect on the science output of the BBC. This does not, however, mean that the Group served no useful purpose. After two years of operation, as planned, the future of the Group was reviewed within the BBC. The Assistant Director of Sound Broadcasting commented on the Group's strategic usefulness in warding off scientific critics:

> ... it has caused us no difficulties (except for a little extra work for our science staff) and its existence will almost certainly prevent the Pilkington criticisms being repeated.[118]

In supporting the retention of the Group, the Head of Talks and Current Affairs observed:

> They have not, it is true, been a forceful or outstandingly constructive group. But they have been friendly and individually helpful.[119]

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[115] WAC R6/239/1, Board of Governors papers 50-69, G.67/64. The affiliations of the members of the Group were as follows. Haddow was Director of the Chester Beatty Research Institute. Bragg was Director of the Royal Institution. Bondi was Professor of Applied Mathematics at King's College, London. Glass was in the Department of Sociology at LSE. Kendrew was on the Medical Research Council; he shared the Nobel prize for chemistry in 1962 with Max Perutz. Linstead was Rector of Imperial College of Science and Technology. Swann was in the Department of Zoology at Edinburgh University. Tett was Chairman of Esso Petroleum.

[116] WAC R6/239/3 memo from R.D. Pendlebury (secretary of the Consultative Group) to D. Tel, D.B.B, 9 November 1965.

[117] Paulu (1981), p. 140. In the context of advisory councils and committees, Paulu writes of the National Councils for Wales, Scotland and Northern Ireland, for which members are selected 'not directly by the BBC, as are all other council and committee members....'

[118] WAC R6/239/3, memo from Assistant Director Sound Broadcasting to Director of Sound Broadcasting, 11 October 1965.

The existence of the Group highlighted the distinction between scientists as individual contributors to broadcasts, and the scientific institutions as pressure groups lobbying BBC management:

> Above all they [Group members] have brought out into the open the reality of the basically excellent relations that have always existed between the producers of our science unit and the operative, as distinct from the hierarchical, scientific world.[120]

The Group was useful for providing a forum in which the BBC's extensive, and often overlooked, science output could be represented to the scientific world:

> The very existence of the group has made it possible for the various [scientific] bodies ... to become aware of the fact that our scientific and technological output always has been greater than they supposed, and is now even fuller than when the group was set up.[121]

As usual, what BBC production staff found particularly helpful was a stable of 'border' or 'periphery' figures occupying a zone intermediate between the inside and outside of the BBC, and sympathetic to the work of the Corporation. Such figures could often be consulted informally by BBC staff for advice and suggestions. The Science Consultative Group had created a new roster of such border figures:

> Hugh Tett was kind enough to read and comment upon Leon Bagrit's Reith Lectures in a personal capacity. Michael Swann has been helpful in advice, consultation and as a contributor. [...][122]

BBC staff had always been sensitive to a distinction between outside interference, which could potentially compromise the BBC professional autonomy, and helpful advice. The Consultative Group, in practice, offered no threat to broadcasting autonomy:

> When our discussions began some three years ago I had hoped that we might avoid the creation of any body which would breathe down our necks urging us to do the impossible in total disregard of the possibilities and

[119] WAC R6/239/3 memo from Head of Talks and Current Affairs to Programme Editor. Arts, Sci & Docs(s): Editor, Science Talks(s), October 1965.

[120] WAC R6/239/3 memo from Head of Talks and Current Affairs to Programme Editor. Arts, Sci & Docs(s): Editor, Science Talks(s), October 1965.

[121] WAC R6/239/3 memo from Head of Talks and Current Affairs to Programme Editor. Arts, Sci & Docs(s): Editor, Science Talks(s), October 1965.

[122] WAC R6/239/3 memo from Head of Talks and Current Affairs to Programme Editor. Arts, Sci & Docs(s): Editor, Science Talks(s), October 1965.

> limitations of broadcasting. My fears have not been realised. Such criticisms as they have made have been reasonable....[123]

Where relations between the BBC and the world of science were concerned, it was necessary always to distinguish between 'private' and 'public' (or 'official') relations. Private relations were those between individual BBC producers and science broadcasters or advisors. Public (i.e. official) relations were those between the Corporation and the scientific institutions such as the British Association and the Royal Society. The Consultative Group had improved *public* relations between the BBC and the scientific world:

> To dissolve the group at this stage might well create ill will and harm the much improved official relations – as distinct from the private ones, which have always been good.[124]

The Science Consultative Group thus became a permanent fixture at the BBC, with its own constitution. The term of membership was fixed at four years. Although the name of the group remained 'Science Consultative Group', there was an understanding that it was concerned with both science and technology, and this hybrid remit was represented in its membership.[125] The usefulness of the Group, as the above shows, lay not in the business the group transacted, but in its location on the border to between broadcasting and science, and in what it represented to the institutional worlds of British science and to the BBC.

The Group existed for almost three decades. By 1992 it had ceased to exist, apparently having been terminated (along with much else) by John Birt, Director General from 1992–2000.[126]

Summary of Chapter 6

The second half of the 1950s and early 1960s saw the adoption of science and technology into social policy in many countries around the world. This was related to factors such as cold-war politics, the start of space exploration, the development of nuclear power, and an increasing consumer orientation of western society. In this context there was a new wave of scientific interventions at the BBC, starting with Sir

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[123] WAC R6/239/3 memo from Head of Talks and Current Affairs to Programme Editor. Arts, Sci & Docs(s): Editor, Science Talks(s), October 1965.

[124] WAC R6/239/3 memo from Head of Talks and Current Affairs to Programme Editor. Arts, Sci & Docs(s): Editor, Science Talks(s), October 1965.

[125] WAC R6/239/3, memos from R. Pendlebury, 22 April 1966 and 24 October 1966, and from Director of Sound Broadcasting, 2 November 1966.

[126] Personal communication from Martin Redfern, 29 April 2008 (Refdern, 2008).

Alexander Fleck, in the wake of his 1958 Presidential Address to the British Association, and culminating in a series of submissions to the Pilkington Committee in the early 1960s. These interventions had similar objectives to earlier ones: the raising of the status of science in BBC output, the creation of a centralised science production unit, and an enhanced role for scientists in shaping science broadcasts.

The report of the Pilkington Committee offered no recommendation on the issue, but referred it back to the BBC, making the resolution of the matter a question of internal BBC policy (rather than national broadcasting policy). Two BBC managers were appointed to resolve the matter, and they held further consultations with representatives of scientific bodies. During these consultations, the managers argued strongly against most of the scientists' proposals, such as overtly educational science broadcasts in general programming and the appointment of a scientific manager. BBC managers said these proposals were unworkable from a professional point of view. A report was produced by managers for the BBC Board of Governors in January 1963. It advocated the rejection of all the scientists' proposals except for the setting up a 'Science Consultative Group' along the lines of existing advisory councils. This solution was recommended as the one that would least disrupt existing working practices within the BBC whilst holding out the possibility of placating the scientific institutions from which interventions had arisen.

The Science Consultative Group was established in 1964 and continued to the 1990s. It achieved the intended effect from the point of view of BBC managers of pacifying the most interventionist scientific institutions, and provided useful contacts for BBC production staff.

Conclusions

This thesis makes three distinct contributions to knowledge:

1 It lays important groundwork for a history of science broadcasting in Britain, a little researched subject apart from a few MSc dissertations and articles.

2 It tells for the first time the decades-long story of periodic outbursts between British scientific associations (mainly the British Association for the Advancement of Science) and the BBC. Hitherto, the story has received only fragmentary treatment, and the dispute's recurring character has not been exposed or explored.

3 It accounts for the dispute between scientists and the BBC, for its recurring character, and for its obdurate nature, in terms of bodies of scholarship relating to science communication, professionalism and organizational behaviour.

I will now elaborate on these, in particular relating the historical research in item 2 to theoretical underpinning in item 3.

The thesis has given a historical view of how science production has been organised within the BBC Talks Department, and how science production was related to other types of production. It has discussed the work of Matheson, Adams, Cox and Clow (key figures in the history of science broadcasting), examined their roles, and given quantitative assessment of the amount of science broadcasting the BBC has produced. The ways in which science producers interacted with the world of science, with formal and informal advisors, and with scientific institutions outside the BBC, have been explored. From this we see what's at stake in an attempt by an outside body to assert control over production work.

The historical account described above is the background to a recurring pattern of intervention at the BBC by scientific institutions and individuals from 1926 to around 1961/2. These interventions are shown to have had consistent aims, namely:

the unification of BBC science production into a single department,

the elevation of science to a higher status in broadcast output and in the BBC's planning,

explicit public science education through systematic scientific instruction in mainstream (as opposed to educational) programming,

the securing for scientists of a major role in the planning of science broadcasts, either through the appointment of a scientific manager to oversee production, or through the appointment of a scientific panel of advisers, or both.

The arguments used by scientists to support these proposals were consistent over the decades. Scientists pointed out that science was fundamental to the functioning of modern society, both from an economic and a democratic point of view, and it was seen as offering a model for rational organisation of human activity of many kinds (this is the 'extensive' conception of science identified by Turner[1]). Together these arguments constituted the scientists' 'cosmology' in Douglas's terms. [2] They were the ultimate justifying arguments, and appealed to the natural order – the dependence of the world on science. In addition, science was seen as having great cultural importance. These arguments for promoting science to the public have had a wide currency in the twentieth century and the latter part of the nineteenth century to support science popularisation in books, periodicals, and museums, as shown in Chapter 1. Scientists' wish to see science promoted in radio (and later television) is therefore consistent with their advocacy of science popularisation in earlier mass media.

There was, however, a distinct slant that distinguished scientists' attitude to radio from their attitude to earlier media. It related to the way broadcasting was constituted in Britain. Specifically, for much of the period covered here, there was a monopoly on broadcasting in the gift of the British government. Entrepreneurs could not create their own broadcasting service in the way they might establish their own publishing house. Access to broadcasting was therefore highly restricted, and controlled by a new class of professional – the broadcaster. In addition, broadcasting in Britain had a Reithian mission of cultural and educational enrichment for all.

These characteristics of British broadcasting bore on the most distinctive recurring issue in the interventions: the question of control. Dornan (1990), Whitley (1985), Hilgartner (1990) and others have shown how scientific communication can serve as a way for scientists to establish cultural authority. For instance, by approving or discrediting particular popular accounts of science, scientists can pragmatically guard science's cultural authority. The history of scientific interventions at the BBC shows something akin to this, but more thoroughgoing. Scientists attempted to control not simply the story told about science, but the medium through which the story was told. This control was to be exercised by high level scientific management of science broadcasting, and scientific advisors. In terms of Gieryn's notion of a pragmatically

1 Turner (2008), p.33;

2 Douglas (1986), p. 77.

constructed boundary to science, scientists tried to bring scientific broadcasting within the territory of science. In effect, the boundary of science would be redrawn to encompass science broadcasting, and to diminish the broadcasters' authority over this kind of programming.

By controlling science broadcasting, what scientists stood to gain was, among other things, control of the gatekeeping and framing of science broadcasting. Through control of gatekeeping, scientists would be able to determine which topics could be presented as science, and who could be referred to as a scientist. For example, the thesis has shown that Harrie Massey objected to 'controversial' science being presented on the Third, and the physiologist A. V. Hill advised against a social scientist being allowed to speak as a scientist. As far as the framing of science went, the thesis has shown that scientific interventionists often advocated a didactic approach to science broadcasting, with programmes arranged systematically, the way courses of lectures might be. This was not the BBC's way of framing science except in niche programming such as that for adult education or schools. Furthermore, by proposing a scientific manager who would be an advocate for science within the BBC, scientists sought to influence the place of science relative to other subjects in the BBC's output.

Other groups and professions besides scientist have tried to control broadcasting, as the thesis has shown. Government departments and the British music profession in the 1930s are notable examples. The attraction of the BBC to outside parties lay to a considerable degree in the cultural authority of the BBC. This authority derived from Corporation's monopoly and from its explicit cultural mission. By arguing that science should be privileged in the BBC's output, the interventionists were manoeuvring science to gain more benefit from the cultural esteem associated with BBC output. John Reith knew from the early days of the BBC that it would be subject to such pressures, and the thesis has shown that, by the time of the Pilkington Committee, scientists were regarded within the BBC as one specialist group among many arguing for their own specialism.

Despite the recurring aims of the interventions, there is no indication that the interventionists knew that what they were asking for had been asked for before. Either they were ignorant of earlier interventions, or saw no reason to mention them. This is understandable in terms of Edgerton's concept of futurism, introduced in Chapter 1.[3] In this context, futurism is the idea that the present age is the start of a new and uniquely scientific era, and is therefore one in which the public and popular media have an obligation to regard science as special. However, futuristic arguments,

[3] Edgerton (2006b), p.ix

to be persuasive, must be ahistorical. Acknowledging a history to arguments that are based on the uniqueness of the present undermines those arguments. In fact, the apparent lack of awareness of scientists regarding earlier interventions fits well with Douglas's idea of scientific institutional amnesia, referred to in Chapter 2.[4] Institutional amnesia continuously renders the past irrelevant and invisible to the present. Scientists could therefore repeatedly argue that present circumstances were special, and had unprecedented implications for the public's need to understand science. BBC managers, by contrast, drew on institutional memory in the form of archives and long-serving staff, and deployed them to parry the interventions and eventually to find a resolution.

A further recurring characteristic of the interventions was the underestimation of the amount and creativeness of existing science broadcasts. Often scientists misjudged the amount of science broadcasting because it was framed in ways the scientists did not recognise. Science appeared in general-interest programmes, or other sorts of programme where science was not the ostensible subject. The most extreme example of 'science unawareness' was Marcus Oliphant's call for a new style of science programme – one which would require the appointment of two high-level scientific managers at the BBC for its implementation. When it became clear that the 'new' type of broadcasting already existed (without the two high level scientific managers Oliphant wanted), the discussion shifted to the need for coordination, which was to be achieved through the installation of a scientific manager. The fundamental issue, then, was not content, but control.

The proposed acquisition of scientific control by scientists was intended to be at the expense of the broadcasting profession. The proposals would entail a loss of professional jurisdiction (in Abbott's use of the term[5]) by broadcasting professionals, with a consequent demotion of the status of their role to technical support. Reith's conception of public service broadcasting, however, assumed that BBC staff would control the medium: production staff would be the gatekeepers and framers. In this Reithian model, BBC staff were considered to be independent of vested interests and factions, and therefore able to serve impartially the audience's interests. Broadcasting was constructed as an autonomous profession. Autonomy was part of the professional broadcaster's cosmology. Ursell, Hesmondalgh, Schlesinger and Hendy, cited in chapter 2,[6] have suggested though that this autonomy was not as great as broadcasters claimed. The evidence of this thesis bears this out. Science

4 Douglas (1986), p. 77.

5 Abbott (1988), p. 87.

6 Ursell (2006), p. 158; Hesmondhalgh (2006), p. 53; Schlesinger (1978/1987), p. 134.

producers have been shown to have drawn heavily for guidance on a range of 'border' figures who were not BBC employees but who had a hybrid, border status (in Kohler's sense of the term[7]), being partly inside and partly outside the Corporation. The names of Crowther, Calder, Heard and Huxley are prominent here. At various times they advised, suggested speakers and topics, gave broadcasts, checked scripts from other broadcasters. There is also evidence that at times they devised and planned programmes. Officially, some of these activities could not be admitted to have taken place, and hence at BBC managerial level arcane distinctions were maintained between 'informing', 'advising' and 'controlling'. When the work of border figures is examined, as happens in this thesis, these distinctions look unclear. Crowther's role during war time provided several examples of this.

The extraordinary sensitivity surrounding 'advice' at managerial level in the BBC, and the way it had to be formalised, despite the fact that in practice producers took advice as and where they could, strongly suggests that 'advice' signified more than its ostensible meaning at managerial level. Managers were concerned that external 'advice' could become external control, and that broadcasting could fall into the hands of external interests; in other words, there was a risk of loss of autonomy and an incursion into broadcasters' jurisdiction. This concern over the professional boundary of broadcasting fits with Douglas's characterisation of organisations with a fairly high group commitment, but within which individuals have high levels of autonomy (low grid)[8] – such as the BBC, and indeed scientific bodies such as the British Association. Douglas finds that in such a context, group boundaries are watched jealously. In this connection, the BBC's official advisory bodies were carefully constituted by the BBC not to threaten the autonomy or jurisdiction of the Corporation. Advisory bodies did not manage or direct programmes, and their interaction with the BBC was negotiated. The BBC's wartime arrangement with the Secretaries of the Royal Society was an example, and the Science Consultative Committee was another. In Gieryn's terms, these advisory committees were boundary objects. They enabled the borders of science and broadcasting to be brought close together, without threatening the integrity of either. The committees served to clarify pragmatically each territory through boundary work. These advisory arrangements enabled the scientific world to have some formal interaction with broadcasters, but on the BBC's terms and without compromising BBC authority. Against this background, it is illuminating to notice that the interventions that had most effect, in the sense that BBC managers took them seriously and were prepared to engage in dialogue with the interventionists, were those that originated from

7 Kohler (2002), p.12–19.

8 Fardon (1999), p.117.

members of BBC advisory bodies. I refer here to Oliphant, Hinshelwood and Bragg, who were members of the General Advisory Council at the time of their most active interventions. By contrast, interventions by deputations from the British Association, the Association of Scientific Workers, and the youthful Crowther (in 1926) made no headway. And yet despite the serious hearing given these advisory figures, the managers and producers of the BBC were unwilling to accept the premises of their arguments. In the case of the Henry Dale experiment, the need for a change of practice regarding coordination was not accepted within the BBC. In the case of Bragg's science broadcasts for the Overseas Service (largely devised by Crowther), BBC managers did not accept Bragg's view that they were suitable for the domestic service. The final scientific interventions, in connection with the Pilkington Committee, similarly made no progress at first. It was because the Pilkington Committee required the BBC to reconsider the submissions that a resolution was achieved. The compromise the BBC management was prepared to accept was one that did least injury to the Corporation's jurisdiction and autonomy. As an incidental result, the BBC gained a new roster of border figures, in the form of the members of the Science Consultative Group.

The thesis has shown that the responses of BBC staff to the interventions were as formulaic as were the interventions themselves. Managers produced lists of science broadcasts (always to the surprise of interventionists), they extolled the scientific competence of production staff, and they explained the procedures production staff used for staying abreast of current scientific developments. In other words, the standard response by BBC managers was to assert the professional competence of its staff, as though professional competence were the issue. However, the central case advanced by the scientific interventionists was not related to professional competence. Its premise was that science had a special place in the modern world and therefore was owed a special place in broadcasting. This point was not addressed by BBC managers. By not engaging with the issue, managers implicitly rejected it. This is understandable in relation to Abbott's professional process of colligation.[9] Colligation is the way of separating relevant features of evidence from irrelevant, prior to allocating relevant features to the profession's knowledge categories. In the case of BBC broadcasting, 'professionalism', as shown by Burns,[10] was an evaluative term relating to the quality of the finished product, and the skill required to create it. Criticism of broadcasting by interventionists was therefore interpreted within the BBC as impugning staff's professionalism, and defended accordingly. For the various scientific deputations, though, broadcasting professionalism – with its

9 Abbott (1988), p. 41

10 Burns (1977)

implicit privileging of broadcasters' autonomy – was part of the problem. The thesis shows that the interventionists sought a restructuring of management, and a major shift of gatekeeping and framing practices. In the interventionists' view, the BBC must become motivated by the need to promote the public understanding of science; and it must set itself the task of remedying the public's misperception of science by driving home the message of science's importance. The setting up of a separate science department, with its own manager, was at least partly intended to create an advocacy for science within the BBC that could secure the desired privileges for science. The essence of the disagreement can be seen, emblematically, to crystallise around the word 'coordination'. For the interventionists, coordination stood for a gathering together of resources in the BBC to privilege science. For the BBC's managers, however, coordination, in so far as the notion was entertained, meant encouraging different areas of production to confer with each other so as to improve efficiency of production. These differing interpretations of the nature of the issue go to the heart of why it proved so intractable, and why it persisted for so long.

Future study

In relation to research into science (and technology) broadcasting, several areas call for further investigation. Television science is hardly touched on here, but has a more-than-fifty-year history. Outside the UK, broadcasting has been based on models, ranging from state-owned monopolies to entirely private ventures with no rationale except a commercial one. The treatment of science broadcasting in those other countries would allow international comparison to be made. (Work on science broadcasting in the USA has been published by Marcel La Follette.[11])

The content of science broadcasts itself has been little explored. In many cases, scientists' broadcasting work was a significant part of their popularising mission. The posthumously controversial psychologist Cyril Burt, for example, was a prolific broadcaster, but Hearnshaw's biography of him (the most extensive biography) has almost nothing to say about his broadcasting work.[12] Other scientists with a significant history of broadcasting for the BBC include the pioneering cyberneticist W. Grey Walter, the biologists John R. Baker and Julian Huxley. Likewise, the broadcasting work of pioneering popularisers Gerald Heard and Ritchie Calder awaits investigation.

Several BBC producers have been influential in science broadcasting and await further study. Mary Adams is a prime example, but others include T. S. Gregory,

[11] LaFollette (1982, 2002a, 2002b, 2008)

[12] Hearnshaw (1979). On p. 84 Hearnshaw mentions a broadcast by Burt in 1945 which led to the founding of Mensa, but no record of this broadcast has been found. Hearnshaw's list of Burt's publications (pp. 321–38) does, however, list reprints in *The Listener* of broadcasts by Burt.

who brought an extraordinary number of computing pioneers to the microphone in the early 1950s, and Archibald Clow, whose long career at the BBC stretched from the immediate post-war era to productions for the Open University in the early 1970s. Outside Talks and Educational broadcasting, the science output of the Features department, and the work of Features producers Isa Benzie and Nesta Pain, remains unknown. These were probably some of the more creative workers in science broadcasting, using dramatisation and imaginative reconstruction in their programmes.

Finally, the relationship between the interventions described here and scientific interventions in wider areas of public policy, such as government and administration, has only been lightly touched on. Fuller exploration would require deeper investigation of the activities of key individuals, for example Cyril Hinshelwood and Alexander Todd, and key organisations, notably the British Association for the Advancement of Science.

These reflections, I believe, indicate that broadcast science in general, and radio science in particular, with their intimacy, pervasiveness, persuasiveness (or otherwise), personalities, and claims for authority, offer plenty of scope for researchers from diverse backgrounds, such as media studies, science and technology studies, science history, and broadcasting history.

Appendixes

Appendix 1 Science broadcasts, 1943

The list is based on an undated document in WAC R51/529, augmented with information from the following sources:

WAC Crowther Contributor file

WAC R51/523/4

Crowther Archive, Box 86

Royal Society of London, A. V. Hill correspondence

Broadcast date	Title	Series title	Broadcaster(s)	Service
04/01/1943	Copying nature (1) Aviation	Children's hour	Aspeden, William	
06/01/1943	Sir Isaac Newton	Children's Hour	Gould, Commander	
09/01/1943	Photo-telegraphy	Ariel in wartime	Griffith, N G	
09/01/1943	Publishing books by radio	Ariel in wartime	Liem, H D	
10/01/1943	The Solar system (part 5)	The solar system	Parker, E N	
13/01/1943	A scientist in north Russia		Gordon, Prof W T	
15/01/1943	Man's Heritage	Reshaping Man's Heritage	Wells, H G	Home
17/01/1943	The solar system (part 6)	The solar system	Parker, E N	
20/01/1943	Snakes	The World Goes By	Watling, Cyril	
22/01/1943	Man's food	Reshaping Man's heritage	Drummond J C and Crick, W F C	Home and Forces
27/01/1943	Dehydration of food	Schools current affairs talks	Dixon, Haynes; Gibbs, Evelyn; Macrae, Squad. Ldr	
29/01/1943	The Good Earth	Reshaping Man's Heritage	Ogg, W G	Home and Forces
30/01/1943	Scientists' conference at Caxton Hall		Huxley, Julian	
31/01/1943	Scientists' conference at Caxton Hall		Huxley, Julian	
02/02/1943	Meeting of science workers (see notes)	Schools news commentary	Brown, Hilton	
04/02/1943	R J Mitchell, designer of the Spitfire	Men behind Victory		Home and Forces?
05/02/1943	Reshaping plants and animals	Reshaping Man's heritage	Haldane, J B S	Home and Forces?
06/02/1943	Water power	Ariel in wartime	Halcrow, W T	
06/02/1943	The use of water power	Ariel in wartime	Haldane, T Graeme	

Broadcast date	Title	Series title	Broadcaster(s)	Service
11/02/1943	‘Water Magic’, the story of dehydration	Men behind Victory		Home and Forces?
12/02/1943	Sir Joseph Banks	Tonight’s talk	Andrade, E N da C	
12/02/1943	Fighting Man’s Competitors	Reshaping Man’s Heritage	Munro, J W and Fisher, James	Home and Forces?
17/02/1943	Refrigeration	Everybody’s scrapbook		
18/02/1943	The magnetic mine and the men who helped to beat it	Men behind Victory		Home and Forces?
19/02/1943	Preserving Food	Reshaping Man’s Heritage	Appleton, Sir Edward	Home and Forces?
19/02/1943	Interview with Leslie Mitchell	Close Up	Whyte, Lance	
20/02/1943	Radiolocation	Ariel in wartime	Brown, Flight Off. Mary	
20/02/1943	Plastic aircraft	Ariel in wartime	Edelman, Maurice	
20/02/1943	Printing long ago	Ariel in wartime	Kelly, Howard I	
23/02/1943	Pasteur (see notes)	Schools broadcast		
23/02/1943	Let there be light	Tonight’s talk	Glenny, Trevor	
25/02/1943	The men behind Britain’s Merchant Air Fleet	Men behind Victory		Home and Forces?
26/02/1943	Colonial medical service	Tonight’s talk	Smart, Dr A G H	
26/02/1943	The Conquest of the Germ	Reshaping Man’s Heritage	Witts, L J	Home and Forces?
03/03/1943	Halley’s comet	Everybody’s scrapbook	Jones, Dr Spencer (see notes)	
05/03/1943	The Conquest of the Tropics	Reshaping Man’s Heritage	Kauntze, H W	Home and Forces?
10/03/1943	Glass and other plastic materials	Schools current affairs	Hatfield, Dr Stafford; Gibbs, Evelyn	
11/03/1943	The Test Pilots	Men behind Victory		Home and Forces?
12/03/1943	The Banishment of Pain	Reshaping Man’s Heritage	Witts, L J	Home and Forces?
18/03/1943	The story of radiolocation	Men behind Victory		Home and Forces?
19/03/1943	Preventive Medicine	Reshaping Man’s Heritage	Mackintosh, James M.	Home and Forces?
26/03/1943	Man’s Lengthening Life	Reshaping Man’s Heritage	Edge, Major Granville	Home and Forces?
31/03/1943	Dr William Harvey	Everybody’s scrapbook		
02/04/1943	Summing Up	Reshaping Man’s Heritage	Huxley, Julian S	Home and Forces?
04/04/1943	Dishonour be my destiny			

Broadcast date	Title	Series title	Broadcaster(s)	Service
14/04/1943	Newton's Library	The world goes by	Lock, Sanford	
16/04/1943	Diamond die research centre	Tonight's talk	Glenny, Comm. Trevor	
19/04/1943	Nought isn't nothing		Hughes, Richard	
21/04/1943	Swedish paper	The World Goes By	Davies, John Langdon	
05/05/1943	Modern copper production	The world goes by	Pryor, E J	
17/05/1943	Gold mines in Britain		Gordon, Prof W T	
19/05/1943	The planets in the sky	During the interval	Parker, E N	
02/06/1943	Europe's health after the war	The World Goes By	Davies, John Langdon	
04/06/1943	The electron microscope	Tonight's talk	Darwin, Sir Charles	
05/06/1943	War against the locust			
16/06/1943	Science after the war	The world goes by	Davies, John Langdon	
21/06/1943	Anti-locust organisation in the Middle East	News talk	Talbot, Godfrey	
23/06/1943	Brain surgery	The world goes by	Crammer, John	
26/06/1943	Copernicus and Vesalius	Pathfinders of science	Davies, J D Griffith	
27/06/1943	Mosquito control measures (despatch from Cairo)	News item		
02/07/1943	War on locusts	News item	Talbot, Godfrey	
07/07/1943	Glass clothing	The world goes by	Davies, John Langdon	
08/07/1943	Marching on			
14/07/1943	Milk analysis	At home today	Egdell, John	
14/07/1943	Animal intelligence (1)	The world goes by	Harrisson, Tom	
14/07/1943	Archimedes of Syracuse	The World Goes By	Parker, E N	
20/07/1943	The diesel	Engines of war and peace	Paxman, Edward	
21/07/1943	Rothamsted centenary	The world goes by	Hurd, Anthony	
04/08/1943	From microphone to loudspeaker (see notes)	BBC close up		
04/08/1943	Animal intelligence (2)	The world goes by	Harrisson, Tom	
18/08/1943	Broadcasting on short waves (see notes)	BBC close up		
25/08/1943	Animal intelligence (3)	The world goes by	Harrisson, Tom	
29/08/1943	Antoine Laurent Lavoisier (1743-1794)		Hartley, Sir Harold	
01/09/1943	Prefabricated houses	At home today	Blanco-White, Justine	
10/09/1943	Invention of the stethoscope	Strange to relate		

Broadcast date	Title	Series title	Broadcaster(s)	Service
15/09/1943	Human intelligence	The World Goes By	Harrisson, Tom	
15/09/1943	Sphagnum moss	At home today	Smiley, Margaret	
16/09/1943	Marching on			
23/09/1943	Scientific research		Bernal, J D	
25/09/1943	Books on natural science	What I'm reading now	Parker, E N	
01/10/1943	Science and the house		Huxley, Julian S	Home
01/10/1943	Science and the House	Science at your Service	Huxley, Julian S	Home and Forces?
01/10/1943	The Solar System (part 5)	The Solar System	Parker, E N	Home?
03/10/1943	The helicopter	News talk	Masefield, Peter	
06/10/1943	Locusts	The world goes by	Huxley, Elspeth	
06/10/1943	Substitute materials	Schools current affairs	Searle, Christopher; Hatfield, Dr Stafford	
08/10/1943	The Science of Building	Science at your Service	Appleton, Edward and Burt, G	Home
15/10/1943	Plastics	Science at your Service	Bragg, Lawrence	Home and Forces?
22/10/1943	Clothing and fabrics	Science at your Service	Speakman, J B	Home
26/10/1943	Visibility 20 miles (see notes)	British Craftsmen	Mills; Lancaster; Elliott; Baker; Jukes	
29/10/1943	Explosives	Science at your Service	Read, John	Home
03/11/1943	Veterinary research work		Harbour, H E	
05/11/1943	Making maps and charts for the navy	Tonight's talk	Glenny, Comm. Trevor	
05/11/1943	Sounding the Earth's Crust	Science at your Service	Rankine, Dr A O	Home and Forces?
10/11/1943	Uses of Nettles	Marching on		
12/11/1943	Our Weather	Science at your Service	Johnson, Sir Nelson	Home and Forces?
19/11/1943	The Housewife and the Fisheries	Science at your Service	Graham, Michael	Home and Forces?
25/11/1943	The Royal Society	Schools senior history talk	Bragg, Sir William (see notes)	
26/11/1943	Saving Life at Sea	Science at your Service	Parker, A and Humphreys, H S	Home and Forces?
03/12/1943	Science and Ship Design	Science at your Service	Kent, J L P	Home and Forces?
05/12/1943	Scientific Humanism	Humanism	Huxley, Dr Julian	
09/12/1943	How the modern world has built on work of early scientists	Schools senior history talks		

Broadcast date	Title	Series title	Broadcaster(s)	Service
10/12/1943	Tunnel Builders	Science at your Service	Groves, G L	Home and Forces?
17/12/1943	Science in National Life	Science at your Service	Bullard, E C	Home and Forces?

Appendix 2 Science broadcasts, 1949

List of science broadcasts prepared at the request of the Anderson subcommittee at their meeting on 27 June 1949

This list is transcribed from a list in WAC R6/34

FEB = Forces Educational Broadcast (in the Light programme)

date	service	title	speakers
20/3/1949	Midland	Look Ahead- Proteins	Feature
22/3/1949	Midland	Look Ahead - Heredity	Feature
repeated 27/3/1949			
22/3/1949	Light	New Horizons - New Calculating Machines	Feature
23/3/1949	Light	Science and Everyday Life - Clean food (FEB)	Barnett, Anthony
23/3/1949 repeated 12/6/1949	Third	Pierre Simon, Marquis de Laplace	Porter, J G
24/3/1949	Home	Science Survey - The Pacific Science Congress	Haslett, Arthur
27/3/1949	Home	The Naturalist - Grasses	Brian Vesey-Fitzgerald, Brian; C E Hubbard, C E; Turrill,
28/3/1949	Third	Continuous creation	Hoyle, Fred
repeated 10/4/1949			
29/3/1949	Midland	Look Ahead - New Look World	Feature
repeated 3/4/1949			
31/3/1949	Home	Science Survey - Let's Talk about roads	Glanville, W H
31/3/1949	Scotland	Science Review - Multiple Births	Crew, F A E
6/4/1949	Home	Science and Everyday Life - Clothing (FEB)	Rees, W Howard
6/4/1949	Third	Simultaneous discovery	Whyte L L
repeat of 17/11/1947			
6/4/1949	Home	The Eye Witness - Living Fossil - Dawn Redwood	Taylor, Dr George
6/4/1949	Home	The Eye Witness - Background to 'Dawn Redwood'	Glass, J Barrie
7/4/1949	Light	New Horizons - Typhoid	Feature
7/4/1949	Home	Science Survey - The cat's whisker again	Kinman, T H
10/4/1949	Third	Fireweed	Gutteridge, Bernard
repeated 14/6/1949			
12/4/1949	Third	Society Physician	Witts, L J

13/4/1949	Light	Science and Everyday life - Dry cleaning	Willcock, Henry
14/4/1949	Home	Science Survey - Isotopes inaction	Russell, Scott
14/4/1949	Scotland	Science Review - American engineering and ours,	Sutherland, Hugh B
20/4/1949	Light	Science and everyday life - Housing (FEB)	Stephenson, Prof Gordon
21/4/1949	Home	Science Survey - Designing a big bridge	Jones, J. E
24/4/1949	Home	The Naturalist - Greenshank	Vesy-Fitzgerald, Brian and Koch, Ludwig
26/4/1949	Light	New Horizons - Exploring the Universe by Radio	Feature
27/4/1949	Light	Science and everyday Life - Housing (FEB)	Stephenson, Prof G.
27/4/1949	Third	Science and philosophy	Samuel, Lord
repeat of 17/9/1948			
28/4/1949	Home	Science Survey - The sun's outer atmosphere	Redman, R O
28/4/1949	Scotland	Science Review - work of Royal Observatory, Edinburgh	Prof W M H Greaves
29/4/1949	Light	Topic for tonight - the Partial Eclipse	Haslett A W
3/5/1949	Third	Book Review - Emmanuel Swedenborg - Scientist and Mystic	Raine, Kathleen
3/5/1949	Light	New Horizons - Heredity	Feature Programme
4/5/1949	Light	Science and everyday life - housing	Meyrick, S
5/5/1949	Home	Science Survey - the problems of being a tree	Jane, F W
10/5/1949	Home	The silent areas. Shortened version of 27/12/1948	Feature
11/5/1949	Light	Science and everyday life - the development of the microscope	Underwood, E A
11/5/1949	Third	The physical basis of Mind	Sherrington, Sir Charles; Dale, Henry; Adrian, E D
12/5/1949	Home	Science survey - coal into coal	Johnson, Patrick
12/5/1949	Scotland	Science Review - Damage to timber by insect pests	Fisher, Dr R C
14/5/1949	Third	Physical basis of mind - the anatomical background of mental processes	Gros Clarke, W E le
15/5/1949	North	In your garden - Board of Greenkeeping Research station at Bingley	Loads, Fred
16/5/1949	North	Talks on Science - Edward Jenner and vaccination (children's hour)	Heys, Harry
17/5/1949	West	Jenner Bi-centenary	Hewer, Dr T F
14/3/1939	Third	Einstein	Russell, Bertrand
repeated 17/5/1949			

18/5/1949	Home	Eye witness - Radiochemical centre at Amersham	Grove, Dr W P
18/5/1949	Home	In Britain Now. Methods used for weather forecasting at Dunstable	Bilham, E G
18/5/1949	Light	Science and everyday life - New Worlds revealed under a microscope - cells	Underwood, Dr Ashworth
19/5/1949	Home	Science Survey - Architecture of molecules	Todd, A R
19/5/1949	Third	The Physical basis of the mind. The self-organising machine	Zuckerman, Prof. S.
21/5/1949	Third	The physical basis of the mind - consciousness	Slater, Dr E T O (broadcasting anonymously)
22/5/1949	Home	The Naturalist - weasels	Vesey-Fitzgerald, Brian; Young, Sheila; Hawkins, Desmond
22/5/1949	Home	Open on Sunday. Science Museum No 1	Boumphrey, Geoffrey
22/5/1949	Home	The world goes by - aerodynamics of insects	Sotavalta, Olavi
22/5/1949	Third	Rhododendrons - their botany and history	Taylor, Dr George
25/5/1949	Light	Science and everyday life - the relation of microbes to disease	Underwood, E Ashworth
26/5/1949	Home	Science Survey - Elastic concrete - prestressed concrete	Bowie, P G
26/5/1949	Third	The physical basis of mind - speech and thought	Brain, Dr W Russell (broadcasting anonymously)
26/5/1949	Scotland	Science Review -	Research on control of tuberculosis Clark Dr W G
27/5/1949	Third	The physical basis of the mind - Evidence of brain operations	Penfield, Wilder
29/5/1949	Home	Open on Sunday. Science Museum no. 2	Boumphrey, Geoffrey
29/5/1949	Home	The World Goes By - the Interplanetary Society	Gatland, K W
29/5/1949	Third	Mesons	Powell, Prof C F
30/5/1949	Scotland	Reformation of medicine	Feature programme
1/6/1949	Light	Science and everyday life - Germs as man's allies (FEB)	Barnett, Anthony
1/6/1949	Third	The physical basis of mind - A philosopher's symposium	Samuel, Viscount; Ayer, A J; Ryle, Gilbert
5/6/1949	Home	The world goes by - supersonic planes	Nonweiler, Terence
7/6/1949	Scotland	Science review - spread of bracken in Scotland during last 50 years	Braid, Prof K W; Conway, Dr E
8/6/1949	Light	Science and everyday life - How man employs micro-organisms (FEB)	Barnett, Anthony
10/6/1949	Light	Woman's Hour - Report on the London School of Hygiene and	Drew, Ruth

		Tropical Medicine exhibition	
15/6/1949	Third	Science and everyday life - Science and Public Health (FEB)	Underwood, Dr E Ashworth
19/6/1949	Home	The naturalists - Lizards	Vesey-Fitzgerald, Brian; Lester, jack; Knight, Maxwell
19/6/1949	Third	Sea anemones at Tenby	Bone, Stephen
21/6/1949	Scotland	Science review- work carried out aboard fishery research vessel	Lucas, Dr C E; Ritchie, Dr A; Parrish, B.
22/6/1949	Light	Science and everyday life (FEB)	Glanville, W H
17/3/1949	Home	Bikini or Bluff	Bronowski, Dr J
repeated 22/6/1949			
26/6/1949	Home	The World goes by - I was a guinea pig in the Arctic	Liversidge, Douglas
28/6/1949	Third	Vicarage plants	Grigson, Geoffrey
29/6/1949	Light	Science and everyday life - science and railways (FEB)	Appleby, William
29/6/1949	Third	A matter of facts. The book - 'Science versus Idealism'	Bronowski, Dr J

Schools science broadcasts 19 March-30 June 1949

23/3/1949	Home	General Science - Your body and how it works	Eggleton, Philip
24/3/1949	Home	Nature study - Pond Life	Kennedy, Scott
24/3/1949	Home	Science and the community - nursing	Wyatt, Honor
25/3/1949	Home	Talks for sixth forms - Atomic energy piles	Dunworth, Dr John
30/3/1949	Home	Current affairs - search for uranium	Haslett, A W and Cameron, James (latter anonymous)
27/4/1949	Home	General science - Man and metals	Hanson, C.
28/4/1949	Home	Nature study - Badgers	Kennedy, Scott
28/4/1949	Home	Science and the Community - From birth to Maturity	Palmer, Richard
4/5/1949	Home	General Science - Man and Metals	Hanson, C
4/5/1949	Home	Science and the Community	Palmer, Richard
5/5/1949	Home	Nature Study - Animal Food	Eggleton, Philip
11/5/1949	Home	General Science - man and Metals	Hanson, C
12/5/1949	Home	Science and the Community, From birth to maturity	Palmer, Richard
12/5/1949	Home	Nature study - Bird visitors	Steven, David
13/5/1949	Home	Talks for sixth forms - Are we becoming less intelligent?	Thomson, prof G.
17/5/1949	Home	New commentary - Operation carried out at Guy's Hospital	Watkins, Ernest

		which was televised	
17/5/1949	Home	Panorama. Changing Africa, Magic and medicine, medicine man and modern physician	Armattoe, Dr R G
18/5/1949	Home	General Science - Man and Metals - Steel	Hanson, Chris
18/5/1949	Home	News commentary - weather forecasting - its importance to farmers and airmen	Jacobson, Sydney
19/5/1949	Home	news commentary - the Atomic clock	Liddell, Helen
19/5/1949	Home	Science and the community - from birth to maturity - the growing body	McCloy, James
19/5/1949	Home	Nature study - at the Farm	Kennedy, Scott
20/5/1949	Home	Talks for sixth forms. What becomes of clever children?	Glass, D V
25/5/1949	Home	General science. Man and Metals. Aluminium	Hanson, Chris
26/5/1949	Home	Science and the community. From birth to maturity. Training your muscles	Eggleton, Philip; Abrahams, Harold
26/5/1949	Home	Nature study - A bird observatory	Waterson, George
1/6/1949	Home	General Science. Man and his animals. The story of the horse	Vesey-Fitzgerald, Brian
2/6/1949	Home	Science and the community. From Birth to Maturity. The school doctor talking	Grundy, Dr F N (anon.)
2/6/1949	Home	Nature study. Butterflies	Kennedy, Scott
9/6/1949	Scotland	Nature study. Listen to the Birds	Fisher, G D
15/6/1949	Home	General science. Man and his animals. The dog and his world	Vesey-Fitzgerald, Brian
16/6/1949	Home	Science and the community. From Birth to Maturity. Health in the Factory	Wyatt, Honor; Plumbs, C. Conway
16/6/1949	Home	Nature study. The Rock Pool	Kennedy, Scott
16/6/1949	Home	History 2. Science helps the Farmer. Experiments at Rothamsted	Lawes, Sir John experiments. Script by Russell, Sir John
20/6/1949	Home	News commentary. The Mechanical Brain	Fox, Gerard
22/6/1949	Home	General science. Man and his animals. The cow	Patterson, J.
23/6/1949	Home	Science and the Community. From Birth to maturity. health in the Factory no. 2	Meredith, Patrick
23/6/1949	Home	Nature study. Thunder and lightning	Mee, A J
30/6/1949	Home	Science and the community - Health in the mine	Winn, Arthur
30/6/1949	Home	Nature study - snakes	Kennedy, Scott

Television science, 14 may-30 June 1949

14/5/1949	Television	This is Britain no. 33. How children's squints are cured by new science orthoptics	
24/5/1949	Television	Under the microscope - the cultivation of living tissues. (Film from Strangeways Research Laboratory)	
1/6/1949	Television	Picture Page. Ex-bus conductor with rare cactus plants	Bates, John T.

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Archive sources

The bulk of the archive material consulted for this thesis is at the BBC Written Archives Centre at Caversham, Reading, in the UK.[1] Archive material from this source is introduced by 'WAC' at the start of the reference. The letters and numbers following this abbreviation indicate a particular folder of papers. For example, WAC R51/523/2. (The R51 series covers the work of the Talks department.) The Written Archive Centre also holds files on contributors, called 'contributor files'. These typically contains correspondence with the contributor, contracts to appear on the BBC, and other miscellaneous documents.

A number of non-BBC archives were consulted. The Bodleian Library (New Library) at the University of Oxford, UK[2] holds an archive of material for the British Association for the Advancement of Science. However, its holdings for the period covered by this thesis are meagre. The Royal Society of London's Library has an archive of material relating to the Society and its members.[3] This is particularly useful for correspondence, for example between the BBC and Professors A. V. Hill and A. C. G. Egerton.

A number of personal archives were consulted. The J. G. Crowther archive, designated the 'Crowther Papers', is among the University of Sussex Special Collections, housed in the main Library of the University of Sussex.[4] This extensive archive runs to over 300 boxes of materials. An archive of papers relating to the BBC producer and manager George Barnes is held in the Archive Centre at King's College, University of Cambridge.[5] The Solly Zuckerman archive is held at the Archives Department of the University of East Anglia.[6] A series of papers relating to the establishment of the Science Committee of the British Council are held in the part of the archive relating to the 'Tots and Quots' club, SZ/TQ/2/6 and SZ/TQ/2/7.

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1 BBC Written Archives Centre, Peppard Road, Caversham Park, Reading, RG4 8TZ, UK

2 Bodleian Library - New Library, Parks Road, Oxford, OX1 3BG.

3 Library and Information Services, The Royal Society, 6-9 Carlton House Terrace, London SW1Y 5AG, UK.

4 Special Collections, The Library, University of Sussex, Brighton, BN1 9QL, UK.

5 Archive Centre, King's College, Cambridge CB2 1ST, UK.

6 The Archives Department, University Library, University of East Anglia, Norwich NR4 7TJ, UK.

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