

A Scientific Impresario

Archie Clow, Science Communication
and BBC Radio, 1945–1970

Jared Robert Keller

Submitted for the degree of Doctor of Philosophy

Imperial College of Science, Technology and Medicine

Science Communication Unit

2017

Declaration

I, Jared Robert Keller, declare that the contents of this thesis are my own work. All other sources of information have been fully acknowledged.

Copyright Declaration

The copyright of this thesis rests with the author and is made available under a Creative Commons Attribution Non-Commercial No Derivatives licence. Researchers are free to copy, distribute or transmit the thesis on the condition that they attribute it, that they do not use it for commercial purposes and that they do not alter, transform or build upon it. For any reuse or redistribution, researchers must make clear to others the licence terms of this work

Abstract

From the end of the Second World War to the close of the 1960s, the BBC's approach to spoken-word science programming changed considerably. Whereas the BBC of the late 1940s saw itself as a platform from which scientists could deliver authoritative talks on science directly to the British public, the BBC of the late 1960s saw its role as the examination and interrogation of science through journalistic programmes presented by professional broadcasters or science journalists. Utilizing a wide range of archival and primary sources, this thesis details the tensions and deliberations which brought about this transition within BBC radio. In particular it focuses on the career of Archie Clow, a science producer at the BBC from 1945 to 1970 who was instrumental in both defining and implementing the BBC's approach to science broadcasting during this period. His career serves as a lens through which the BBC's changing conception of the value and purpose of science programming can be examined. In the early post-war period Clow fancied himself a 'scientific impresario' charged with the identification and recruitment of eminent scientists, yet by the end of the 1960s many of his colleagues considered themselves journalists rather than impresarios. Archival records show that this had much to do with a transition within the wider BBC toward a more journalistic, news-style approach to spoken-word programming. The thesis argues that by the end of this period the BBC saw itself as a communicator of science in its own right. It further argues that as the BBC moved to mediate science and scientists on behalf of the British public, scientists increasingly lost control over the framing and delivery of science programming, eventually finding themselves largely reliant upon and beholden to professional broadcasters.



Figure 1: Archie Clow in 1969.¹

¹ “In Pictures: The Reith Lectures,” BBC News, December 2, 2014, <http://www.bbc.co.uk/news/in-pictures-13647943>.

Table of Contents

Chapter 1: Introduction	9
1.1. Examining science broadcasting practice.....	10
1.2. Scholarly and archival sources	13
1.3. A (short) history of the BBC.....	19
1.4. News versus comment.....	25
1.5. Science, the media, and the British public 1945-1970	27
1.6. Chapter by chapter overview	31
Chapter 2: The Making of a Science Broadcaster	37
2.1. An Aberdonian chemist.....	37
2.2. On the threshold of a new age.....	41
2.3. Social Technology.....	44
2.4. Bringing about the new age.....	51
2.5. The Aberdeen Scientific Film Club.....	55
2.6. The sooner the better.....	58
Part I: A Post-War Platform for Science	61
Chapter 3: A Functionalist Approach to Science Broadcasting.....	62
3.1. The Services Educational Unit	63
3.2. ‘Science & Everyday Life’	69
3.3. Social Technology in ‘Science & Everyday Life’	74
3.4. Experiments in presentational style	78
Chapter 4: Prestige versus Good Radio.....	84
4.1. Science Survey under Ian Cox	84
4.2. Clow’s memorandum on the future of ‘Science Survey’	92
4.3. ‘a series of programmes not confined to two or three talks by experts’	101
4.4. The response from management.....	104
4.5. Institutional priorities	114
Chapter 5: Science for Elite Audiences	116
5.1. Defining science on the Third	117
5.2. A decade of science on the Third.....	119
5.3. The production of Third Programme talks on science.....	124
5.4. ‘science for scientists’	129
5.5. More of the same	135
5.6. The arrival of ‘science for scientists’	140
5.7. Criteria for success on the Third	143
Chapter 6: Ten Years On	148
6.1. A ‘scientific impresario’	150
6.2. Elite scientists still made for terrible broadcasters.....	153
6.3. ‘between two stools’	156
6.4. ‘the fabric of science broadcasting as a whole’	163
6.5. ‘coordinating science broadcasts over the whole field’	168
6.6. Losing the Light Programme audience.....	175

Part II: Onward Into the Sixties	178
Chapter 7: Mediating Science and Scientists	179
7.1. Bringing scientists ‘down to earth’	179
7.2. ‘making it clear, getting it straight’	185
7.3. ‘It’s the information they want’	193
7.4. ‘something very useful indeed’	198
7.5. ‘Science Review’: from straight talks to interviews	202
Chapter 8: Science in News and Topical Programming.....	207
8.1. News versus current affairs	208
8.2. ‘diluted with journalism to a degree’	210
8.3. C.L. Boltz, BBC Science Correspondent.....	212
8.4. David Wilson: journalistic values and applied science	217
8.5. The changing voice of news.....	221
Chapter 9: Science Journalism and the Critical Turn.....	228
9.1. Michael ‘Mick’ Rhodes and the New Guard.....	231
9.2. ‘Biological Backlash’	237
9.3. ‘a really lively, popular programme of science news and comment’	240
9.4. ‘a rapidly advancing technological society with quickly altering norms’	244
9.5. ‘new styles of presentation’	248
9.6. ‘out into the open’	252
Chapter 10: Conclusion	257
10.1. Twenty-five years on	258
10.2. A question of values and duty	263
10.3. A loss of control	268
10.4. Beyond the sixties: future research and present circumstances	272
Epilogue	281
Bibliography	286
Archival Sources	286
Other Primary Sources	286
Secondary Sources.....	289

List of Figures

Figure 1: Archie Clow in 1969. _____	4
Figure 2: Clow's post-war career. _____	32
Figure 3: A timeline of the numerous long-running series produced by Clow. _____	32
Figure 4: Other BBC personnel involved in the production of science programming. _____	33
Figure 5: Archie receiving his DSc in 1940. _____	38
Figure 6: The newlyweds on their wedding day in 1936. _____	39
Figure 7: A page from <i>The Chemical Revolution</i> tracing the sulphuric acid industry. _____	50
Figure 8: Article congratulating the Clows for winning the Senior Hume Brown Prize. _____	63
Figure 9: <i>Radio Times</i> article announcing the launch of <i>Science Survey</i> in 1946. _____	88
Figure 10: <i>Radio Times</i> listing for the 24 May 1946 broadcast of <i>Science Survey</i> . _____	91
Figure 11: <i>Radio Times</i> listing for the second broadcast of <i>Who Knows?</i> , 8 May 1956. _____	180
Figure 12: <i>Radio Times</i> listing for the 18 October 1962 broadcast of <i>Who Knows?</i> . _____	191
Figure 13: <i>Radio Times</i> listing for the 20 February 1964 broadcast of <i>Who Knows?</i> _____	200
Figure 14: Clow and Frank Fraser Darling prepping for the 1969 Reith Lectures. _____	283
Figure 15: Archie and Nan (right) at the Waldorf Hotel in 1961. _____	285

Acknowledgments

I would like to thank my supervisors, Felicity Mellor and Robert Sternberg, in the Science Communication Unit, Imperial College, London. Robert, your advice was always spot on and always greatly appreciated. Felicity, your insightful comments and challenging suggestions kept me on track throughout this long process and your encouragement kept me going. I could not have completed this thesis without you. I'd offer to make you a cup of tea as a sign of thanks, but we both know Americans can't make a proper cuppa. I would like to thank all the archivists who helped me track down obscure references in long-buried files, in particular Jeff Walden of the BBC's Written Archives Centre. Thanks are also due to Leslie Keller for instilling in me a love of words and for graciously agreeing to serve as a (free) copyeditor throughout my academic career, and to Bob Keller for teaching me the value of hard work and perseverance. Special thanks are due to the Hans Rausing Trust for their monetary support of my research. And finally, my love and gratitude to my wife, Heather. I appreciate more than you know all the time you spent listening to my thoughts on Archie and the Corporation; I do tend to ramble. I will be forever thankful for your support and encouragement over the past years when it was hard to see the light at the end of the tunnel. Have a lie-in, my love; I'm making coffee. And bacon.

A note on language and quotations

Throughout this thesis I have used American rather than British English, with two exceptions: first, within quotes, where the original spelling has been retained; and second, the word 'programme'. The prospect of being confronted with the sentence, 'Clow developed a new program for the Light Programme', was simply too ghastly.

Chapter 1:

Introduction

In the autumn of 1946, Archie Clow, science producer for the Services Educational Unit of the BBC, prepared a memorandum on the future of science programming on BBC radio.¹ Officially, Clow had been asked to comment on the future of *Science Survey* – a weekly series of science talks that had been going out since May of that year – but he took it as an opportunity to comment on science broadcasting as a whole. In the memo, Clow drew upon all of the knowledge and experience he had acquired during previous stints as a research chemist, historian of science, and science communicator, and combined it with everything he had learned about broadcasting during what had been his first year at the BBC.² The result was a 12-page treatise on science broadcasting, complete with an analysis and reformulation of the BBC's approach to science programming. It closed with a call to action:

These facts reinforce my belief that the time has come for putting on the air a series of programmes not confined to two or three talks by experts, but using all the resources at our disposal.³

Within a month of submitting his memorandum, Clow had been appointed as the new producer of *Science Survey*, and would come to guide spoken-word science programming on BBC radio until his retirement 24 years later. This thesis examines the BBC's shifting conception of the value and ultimate goal of spoken-word science programming from 1945 to 1970, using Archie Clow as an entry point into the myriad conversations, tensions, deliberations and struggles that served to slowly refashion science programming during that period. Focusing on the BBC's Talks department, I argue that while in the early post-war years the BBC envisioned itself as a platform from which eminent scientists could deliver authoritative talks, by the end of the period the BBC had come to envision itself as a communicator of science in its own right, prizing

¹ Archie Clow, "Observations on Science Survey and Suggestions for the Future," Memorandum, (October 7, 1946), R51/533/1, Written Archives Centre.

² Clow began working at the BBC in July, 1945.

³ Clow, "Observations on Science Survey," 5.

investigative, journalistic programmes presented not by scientists but by professional broadcasters and science journalists.

In part, this change was a consequence of the fact that the BBC became more established and confident as an institution during this period, and therefore no longer felt compelled to bolster its cultural standing by recruiting eminent figures to appear on its airwaves. It was also in line with an increasing focus on news and journalism across BBC radio as a whole from the late 1950s. The Corporation began to see itself as a broadcasting service that had a duty to examine, interpret, and explain scientific developments to the British public in the way that a political journalist might explain developments in Whitehall. As BBC radio became more news-focused, it increasingly gravitated away from formats like the straight talk where scientists spoke directly to listeners, toward formats like interviews, documentaries and news-style reports which enabled producers and programme-developers to explain, summarize, contextualize, and even criticize what scientists said. As such, the role that the BBC envisioned for itself shifted from the *presentation* of scientists to the British public to the *mediation* of science and scientists on behalf of the British public.

As the BBC stepped in to mediate scientists on behalf of the British public, scientists, who had previously enjoyed a seemingly-direct connection to listeners, found themselves increasingly relegated to a position one step removed from listeners – cast as contributors to science programming rather than as deliverers of science programming.

1.1. Examining science broadcasting practice

This thesis is built upon the conviction that the best way to trace important but slow-developing shifts within the BBC is by examining the day-to-day production of programmes. It is in the daily process of production that the values, assumptions, and beliefs of the BBC are put into practice, challenged, altered or simply ignored. As someone involved in both high-level discussions *and* daily production, Archie Clow is perfectly placed to reveal the BBC's changing conception of science programming. Clow was head of science programming for BBC radio for nearly 25 years and was therefore instrumental in not only drafting the BBC's approach to science programming but implementing that approach. Examining both the form and content of the programmes produced by Clow and the processes by which he produced those programmes provides a window onto the daily working out of the BBC's approach to science programming.

Crucially, in instances when Clow's views differed from those of BBC management⁴ – and there were many such instances – the values and assumptions of each are thrown into high relief. Furthermore, although the BBC is often seen as monolithic, producers, and in particular radio producers, were given wide latitude to develop programmes as they saw fit. As David Hendy has argued in his book, *Life on Air*:

... in radio, a programme can be the work of just one producer or presenter, or at most a small handful – and the simplicity of production makes these people more fully the author of their own work. There is the possibility of individual sensibilities making a difference, and creativity is at the heart of the story. As for the programmes, they matter more than anything else because it is in them that we find the myriad pressures – aesthetic, institutional, personal, political – metabolized and illuminated.⁵

The goal of this thesis, then, is not to provide a biography of Archie Clow, but to trace the BBC's transition to a more journalistic conception of science programming using Clow and his career as a means of illuminating the forces that effected that transition. Specifically, I trace three related and intertwined strands throughout Archie Clow's career: the process of production by which Clow thought up, developed, and implemented his programmes; the form, content, and tenor of the programmes and series he produced over the course of his career; and his approach to and understanding of the ultimate purpose of science broadcasting.

Thus, one strand of this thesis is an exploration of Clow's approach to the production of science programming. Clow envisioned his role at the BBC as that of a 'scientific impresario' tasked with the identification and cultivation of scientists who could deliver informative yet engaging talks on BBC radio. Much of his time and energy as a producer therefore went into helping scientists to express the ideas they wished to communicate. Clow had not always subscribed to such a view, however, and during his first years at the BBC had advocated an entirely different approach to science programming – an approach wherein the BBC would have taken on a much larger role as a communicator of science in its own right. As will be seen, at that time BBC management were quite vehemently opposed to such an approach. Examining the process of production behind the programmes Clow produced over the course of his career

⁴ At various points in this thesis I refer to Clow's superiors as 'BBC management'. This is for the sake of linguistic simplicity and is meant to summarize responses from the archives and convey a sense of the dominant opinion expressed by the people working above Clow. It is not intended to give the impression that I believe the managers, controllers, and directors that made up BBC 'management' reacted in a uniform way to events. There were of course differences of opinion.

⁵ David Hendy, *Life on Air: A History of Radio Four* (Oxford; New York: Oxford University Press, 2007), 8.

enables this thesis to identify the assumptions and beliefs about the role of a science producer that existed within the Talks department, and how these assumptions changed from the early post-war to the late 1960s. Furthermore, examining the discussions Clow had with scientists during the production of programmes highlights scientists' own assumptions about the proper role of a science producer at the BBC.

A second strand of this thesis is an analysis of the programmes produced by Clow. From 1947 to 1959 Clow was the only producer in the Talks department with scientific training, and was therefore instrumental in defining the type of science programming deemed most suitable for BBC radio during the post-war period.⁶ As will become clear early on, Clow had very particular views about what sort of scientific information should be communicated to the British public and how that information ought to be communicated – views that influenced the form and content of the five long-running series he developed and the nearly 2,500 programmes he produced for BBC radio over the course of his twenty-five year career.⁷ If one three and a half month period can be taken as indicative, by the late 1940s Clow was producing nearly half of the science programmes broadcast on BBC radio.⁸ Furthermore, Clow's deliberations with fellow producers and BBC management give a sense of the BBC's conception of the needs and desires of the audiences for its three major radio networks – Light Programme, Home Service, and Third Programme – and the type of science programming the BBC felt could best meet those needs and desires. Finally, once again, Clow's programmes help illuminate scientists' own assumptions about the type of information about science that should be communicated to the British public, and how these assumptions changed throughout this period.

The third strand of this thesis is an examination of Clow's conception of the value and ultimate goal of the science programming he produced. Throughout his quarter-century at the BBC Clow thought of himself as engaged in a cooperative effort with scientists to educate the British public about the potential benefits of science. Multiple times throughout his career, in fact, Clow asserted that as a public service broadcaster the BBC had a duty to help scientists bring the benefits of science to the British public. Although he saw himself as a professional broadcaster and frequently disagreed with scientists, he nonetheless saw his work as a service not only to society, but to science.

⁶ David Edge appears to have joined the BBC sometime in the summer or autumn of 1959. On 31 October 1959 *Nature* noted: "Recently, Mr. David Edge joined Dr. Clow in the Talks Department." "British Broadcasting Corporation Science Unit," *Nature* 184, no. 4696 (October 31, 1959): 1361.

⁷ For details of how this figure was calculated, see Chapter 6.4.

⁸ See Chapter 6.4.

The remainder of this chapter surveys the history of the BBC during the first half-century of its existence, the separation of ‘news’ and ‘comment’ within the BBC, and the relationship between science, the media, and the public in mid-twentieth century Britain. But first, I begin with an overview of existing research in this area and the archival materials used in this thesis.

1.2. *Scholarly and archival sources*

Historical studies of science in the broadcast media are rare. There is a small but growing body of literature examining popular science in non-print media such as television, movies, science films, radio, science museums, and (increasingly) the internet, but the vast majority of studies that examine popular science have analyzed print media, especially books, newspapers, and magazines.⁹ In fact, despite recurrent calls for increased scholarly attention to the role of the

⁹ For television see Roger Silverstone, *Framing Science: The Making of a BBC Documentary* (London: British Film Institute, 1985); Roger Silverstone, *Television and Everyday Life* (London; New York: Routledge, 2006); Gail Davies, “Science, Observation and Entertainment: Competing Visions of Postwar British Natural History Television, 1946–1967,” *Ecumene* 7, no. 4 (October 1, 2000): 432–60; Timothy Boon, *Films of Fact: A History of Science in Documentary Films and Television* (London: Wallflower Press, 2008); Timothy Boon, “‘The Televising of Science Is a Process of Television’: Establishing Horizon, 1962–1967,” *The British Journal for the History of Science* 48, no. 1 (March 2015): 87–121; Timothy Boon and Jean-Baptiste Gouyon, “The Origins and Practice of Science on British Television,” in *The Routledge Companion to British Media History* (Routledge, 2014); Marcel Chotkowski LaFollette, *Science on American Television: A History* (Chicago; London: The University of Chicago Press, 2013). For movies see David Kirby, *Lab Coats in Hollywood: Science, Scientists, and Cinema* (Cambridge, Mass.: MIT Press, 2011); Peter Weingart, Claudia Muhl, and Petra Pansegrau, “Of Power Maniacs and Unethical Geniuses: Science and Scientists in Fiction Film,” *Public Understanding of Science* 12, no. 3 (July 1, 2003): 279–87. For radio see Marcel Chotkowski LaFollette, *Science on the Air: Popularizers and Personalities on Radio and Early Television* (Chicago, Ill.; London: University of Chicago Press, 2008); Allan Clive Jones, “Speaking of Science: BBC Science Broadcasting and Its Critics, 1923–64” (Unpublished PhD dissertation, UCL, 2010); Ralph Desmarais, “‘Promoting Science’: The BBC, Scientists, and the British Public, 1930–1945” (M.A. thesis, University of London, 2004). For museums see Sharon Macdonald, ed., *The Politics of Display: Museums, Science, Culture* (London: Routledge, 1998). For the internet see María José Luzón, “Public Communication of Science in Blogs,” *Written Communication* 30, no. 4 (June 19, 2013): 428–57. For books see Felicity Mellor, “Between Fact and Fiction: Demarcating Science from Non-Science in Popular Physics Books,” *Social Studies of Science* 33, no. 4 (2003): 509–38; Bruce V. Lewenstein, “Science Books Since 1945,” in *The Enduring Book: Print Culture in Postwar America*, ed. D.P. Nord, J.S. Rubin, and M. Schudson (Chapel Hill: University of North Carolina Press, 2009), 347–60; Jon Turney, “Popular Science Books,” in *Handbook of Public Communication of Science and Technology*, ed. Massimiano Bucchi and Brian Trench (Abingdon: Routledge, 2008), 5–14. For newspapers see Martin Bauer et al., “Science and Technology in the British Press, 1946–1990: A Systematic Content Analysis of the Press” (London, UK: The Science Museum, 1995); Fiona Clark and Deborah L. Illman, “A Longitudinal Study of the New York Times Science Times Section,” *Science Communication* 27, no. 4 (June 1, 2006): 496–513. For general interest magazines see Marcel Chotkowski LaFollette, *Making Science Our Own: Public Images of Science, 1910–1955* (Chicago: University of Chicago Press, 1990); Peter J. Bowler, *Science for All: The Popularization of Science in Early Twentieth-Century Britain* (Chicago: University of Chicago Press, 2009); Bruce V. Lewenstein, “Was There Really a Popular Science ‘Boom’?,” *Science, Technology, & Human Values* 12, no. 2 (April 1, 1987): 29–41.

broadcast media in communicating and popularizing science,¹⁰ Mike Schäfer's 2010 meta-analysis of scholarly articles that have analyzed science in the media found "a clear, and even constantly growing, bias towards *print media*, with 70.7% of all analysed publications analysing exclusively print media".¹¹ Studies of radio, amount to less than 4% of all studies of science in the mass media.¹² It is no wonder, then, that Allan Jones refers to this field as the "barely begun field of historical studies of science broadcasting."¹³

The paucity of research in this area is all the more problematic with regards to the late 1940s and 1950s considering radio played a significant part in scientists' efforts to communicate science to the British public during this period. As Jane Gregory and Steven Miller write in *Science in Public*:

Key popularizers of this period were not lecturers or writers: they were broadcasters. Although scientists and science writers achieved commercial success and popular acclaim with books and articles, their readerships were tiny compared to the audiences for science broadcasts.¹⁴

BBC radio not only reached large audiences during this period, it broadcast a fairly significant amount of science. According to a 1949 BBC report, science accounted for "approximately 7.5% of the time devoted to talks and discussions" on the BBC's domestic services.¹⁵ Furthermore, radio talks by scientists were quite popular. Fred Hoyle, for instance, was voted Broadcaster of the Year by BBC listeners in 1950 following the astronomical success and popularity of his five-part series *The Nature of the Universe*.¹⁶ During this period scientists were routinely chosen to deliver some of the most prestigious talks on BBC radio. Of the ten eminent thinkers chosen to deliver a BBC Reith Lecture during the 1950s, five were scientists.¹⁷ Given the reach, quantity,

¹⁰ Calls for increased scholarly attention to non-print media have come from, among others: Jane Gregory and Steve Miller, *Science in Public: Communication, Culture, and Credibility* (Cambridge, Mass: Basic Books, 2000), 41; Massimiano Bucchi et al., "Introduction," in *Handbook of Public Communication of Science and Technology* (London & New York: Routledge, 2008), 3.

¹¹ Mike S. Schäfer, "Taking Stock: A Meta-Analysis of Studies on the Media's Coverage of Science," *Public Understanding of Science* 21, no. 6 (December 1, 2010): 656. Original emphasis.

¹² Schäfer, "Taking Stock: A Meta-Analysis of Studies on the Media's Coverage of Science," 657.

¹³ Jones, "Speaking of Science," 11.

¹⁴ Gregory and Miller, *Science in Public*, 41.

¹⁵ M.G. Farquharson to John Anderson, "General Advisory Council," Letter, (November 25, 1949), R6/34, Written Archives Centre.

¹⁶ Gregory and Miller, *Science in Public*, 37.

¹⁷ The five scientists were: John Zachary Young in 1950, 'Doubt and Certainty in Science'; Robert Oppenheimer in 1953, 'Science and the Common Understanding'; Edward Appleton in 1956, 'Science and The Nation'; Bernard Lovell in 1958, 'The Individual and The Universe'; and Peter Medawar in 1959, 'The Future of Man'.

popularity, and visibility of science programming on BBC radio during this period it is disappointing, if not altogether surprising, that of the general histories of British broadcasting written by Asa Briggs,¹⁸ Burton Paulu,¹⁹ Andrew Crisell,²⁰ and Paddy Scannell and David Cardiff,²¹ none devotes a significant amount of attention to science broadcasting.

Nonetheless, there have been a few noteworthy studies in this area. Allan Jones' PhD thesis, 'Speaking of science: BBC science broadcasting and its critics, 1923–64', represents the most in-depth examination of this area, and, together with his more recent publications, has provided an important foundation for my own thesis.²² Jones reveals the recurrent nature of many high-level scientific interventions into science broadcasting at the BBC, and argues that at the heart of these interventions were questions of authority and autonomy – i.e. who had the authority to design and produce science broadcasts, and how much autonomy should be afforded to each group.²³ If Jones' work can be said to deal primarily with questions of authority and control at the managerial level, then my own research is an effort to extend this analysis into the day-to-day production of science programming at the BBC.

Ralph Desmarais and Jane Gregory have examined the radio careers of Jacob Bronowski and Fred Hoyle respectively,²⁴ and James Farry has looked at the presentation of space science on BBC radio.²⁵ The one book-length survey of science programming on the radio is Marcel LaFollette's *Science on the Air*, though this focuses on the first half of the twentieth century and

¹⁸ Asa Briggs, *Sound and Vision*, vol. 4, *The History of Broadcasting in the United Kingdom* (Oxford: Oxford University Press, 1995); Asa Briggs, *Competition*, vol. 5, *The History of Broadcasting in the United Kingdom* (Oxford; New York: Oxford University Press, 1995).

¹⁹ Burton Paulu, *British Broadcasting: Radio and Television in the United Kingdom* (Minneapolis: University of Minnesota Press, 1956).

²⁰ Andrew Crisell, *An Introductory History of British Broadcasting* (London: Routledge, 1997).

²¹ Paddy Scannell and David Cardiff, *A Social History of British Broadcasting. Vol. I (1922-1939): "Serving the Nation"* (Oxford: Basil Blackwell, 1991).

²² Jones, "Speaking of Science." See also Allan Jones, "Mary Adams and the Producer's Role in Early BBC Science Broadcasts," *Public Understanding of Science* 21, no. 8 (November 2012): 968–83; Allan Jones, "Clogging the Machinery: The BBC's Experiment in Science Coordination, 1949–1953," *Media History* 19, no. 4 (November 2013): 436–49; Allan Jones, "Elite Science and the BBC: A 1950s Contest of Ownership," *The British Journal for the History of Science* 47, no. 4 (December 2014): 701–23.

²³ Jones, "Speaking of Science," 9.

²⁴ For Desmarais on Bronowski see Chapter 4 of Ralph John Desmarais, "Science, Scientific Intellectuals, and British Culture in the Early Atomic Age: A Case Study of George Orwell, Jacob Bronowski, P.M.S. Blackett and J.G. Crowther." (PhD Thesis, Imperial College, London, 2010). For Gregory on Hoyle see Jane Gregory, "Fred Hoyle and the Popularisation of Cosmology" (PhD Thesis, Imperial College, London, 1998).

²⁵ James Farry, "'Far More to It than Appears on the Surface': an Historical Investigation of the Interface between Space Science and the British Mass Media" (PhD Thesis, University of Manchester, 2011).

deals with the American context rather than the British.²⁶ LaFollette charts the rise and fall of science broadcasting on American radio and argues that science broadcasts struggled for airtime in the commercially-driven broadcasting system that developed in the United States. Since this commercial system prized entertainment over education, and profit over edification, science broadcasts were eventually “shuttled to the sidelines by network executives unconcerned about altruistic goals of public education.”²⁷ This thesis serves to fill in a gap in the academic literature by examining science broadcasting within the public service context that developed in Britain. There are also discussions of science on the radio in general works on science communication or science popularization. Gregory and Miller briefly discuss science on BBC radio in their aforementioned book, *Science in Public*, but they spend much more time discussing science on British television than on British radio.²⁸ Peter Bowler’s *Science for All* does not deal with the latter half of the twentieth century, but in a short section dedicated to science on radio, he notes that freedom from “commercial restraints” allowed the early BBC to broadcast “scripted – and hence often very dry – ‘talks’ by intellectuals, including some scientists.”²⁹ This thesis charts the rise and eventual demise of these scripted science talks during the second half of the twentieth century. There have also been a number of studies that have examined the BBC’s treatment of other professions or intellectual pursuits such as religion, architecture, and schools broadcasting.³⁰

The neighboring field of historical studies of science on television is somewhat larger and better established. Tim Boon and Jean-Baptiste Gouyon have examined science on television both individually and jointly.³¹ Roger Silverstone’s study of the making of a science documentary for BBC television remains an important text thirty years after its initial publication.³² LaFollette has followed up her study of science on American radio with a book surveying science on American television from the 1940s through the end of the twentieth century.³³ The works of

²⁶ LaFollette, *Science on the Air*.

²⁷ La Follette, *Science on the Air*, p. 213

²⁸ Gregory and Miller, *Science in Public*, 41.

²⁹ Bowler, *Science for All*, 209.

³⁰ For religion see Alisa Marion Hollinshead, “The Production and Reception of Discourses Concerning Religion in Fictional Broadcasting” (PhD Thesis, University of Glasgow, 2002). For architecture see Shundana Yusaf, *Broadcasting Buildings: Architecture on the Wireless, 1927-1945* (Cambridge, Massachusetts: The MIT Press, 2014). For schools broadcasting see David Crook, “School Broadcasting in the United Kingdom: An Exploratory History,” *Journal of Educational Administration and History* 39, no. 3 (December 1, 2007): 217–26.

³¹ Boon, *Films of Fact*; Boon, “The Televising of Science Is a Process of Television”; Jean-Baptiste Gouyon, “The BBC Natural History Unit: Instituting Natural History Film-Making in Britain,” *History of Science* 49, no. 4 (December 1, 2011): 425–51; Boon and Gouyon, “The Origins and Practice of Science on British Television.”

³² Silverstone, *Framing Science*.

³³ LaFollette, *Science on American Television*.

Rupert Cole, Gail Davies, and Anne Karpf are also worthy of note.³⁴ Together these studies suggest that questions of control and authority influenced the course of science broadcasting over the latter half of the twentieth century. Scientists and broadcasters not only struggled over who should control the medium, but over the framing and content of science programmes broadcast on BBC television. This thesis examines similar discussions on the radio side of the BBC.

The relative scarcity of existing scholarship in this area means that the bulk of this thesis draws on archival and primary source materials – the majority of which are located at the BBC Written Archives Centre (WAC) in Caversham. The WAC contains written documents related to the history, administration, and operation of the BBC from its formation in 1922, and is therefore useful for its collections of programme scripts, BBC publications, special committee reports, correspondence, memoranda, contracts, and minutes of various departmental meetings. The organizational structure of the archive presents a few complications, however. As Allan Jones has written, the WAC “was not created for the benefit of historians, but as a form of institutional memory.”³⁵ There are often holes in the archive in less than opportune places. For instance, for the period under examination in this thesis, the archive often does not contain scripts for one-off programmes – i.e. programmes that were broadcast as stand-alone programmes rather than as part of a regular or multi-part series – and rarely retain files related to the behind-the-scenes production of such programmes. This makes one-off programmes difficult to analyze. In addition, promisingly titled files do not always hold what the researcher might hope. For instance, a WAC folder labeled ‘Science Review’ is not a folder of files related to the production of Archie Clow’s series, *Science Review* – as I had hoped – but a review of research on the range of the BBC’s transmitters. At a more fundamental level, since the archive was created as a form of institutional memory, the documents retained by the WAC may at times represent the BBC’s interpretation of events.

The researcher hoping to use the WAC to examine the history of the BBC also eventually runs into the hegemony of the telephone – a period from about the early 1960s during which conversations and discussions that had previously been conducted through a series of memoranda or in minuted meetings are instead conducted over the telephone. During this

³⁴ Rupert Cole, “1972: The BBC’s Controversy and the Politics of Audience Participation,” *Public Understanding of Science* 26, no. 4 (February 1, 2017): 514–18; Davies, “Science, Observation and Entertainment: Competing Visions of Postwar British Natural History Television, 1946-1967”; Anne Karpf, *Doctoring the Media: The Reporting of Health and Medicine*. (Routledge, 1988).

³⁵ Jones, “Speaking of Science,” 14.

period the only record that an important conversation has taken place is often a short memo saying something to the effect of: 'Just to confirm our telephone conversation the other day. Everything sounds good. I am quite excited about the changes we have made to the series.'

In order to deal with these realities this thesis has avoided placing too much emphasis on a single document if that document cannot be corroborated or confirmed by the content of a file or document located elsewhere in the archive. One of the reasons Clow is a convenient central figure, in fact, is that since he was such a long-serving producer and the multiple series he produced were so long-running, the WAC retains not only full records of the scripts for a majority of his series, but folders filled with files related to the production of those series. These production files are crucial for they show producers and contributors explicitly debating the approach, form, content, and purpose of a series. By focusing primarily on series that contain such production files, it is possible to recount exactly what Clow and his scientist-communicators wrote about their goals for the programmes they produced. This is obviously preferable to focusing on one-off science programmes or shorter science series that often do not have as robust an archival record.

Along these lines, it is worthwhile at this stage to identify areas that are not covered within this thesis. By 1938, seven different departments within the BBC could produce programmes on science: Talks, Features and Drama, News, Schools, Television, Outside Broadcasts, and Overseas Broadcasts.³⁶ Though science features and schools broadcasts are worthy of study, the decision to focus on the career of Archie Clow means this thesis examines the science programmes produced by the Talks department – and occasionally the News department – rather than those of the Features or Schools departments. Similarly, the primary focus of this thesis is on the BBC's domestic services rather than its overseas services, though Chapter 8 does briefly touch upon the science programming broadcast on the European Service and General Overseas Service. It is hoped that in the next few years an enterprising researcher will extend to features, schools, and overseas broadcasts the attention they deserve. The production of science programming on BBC television is discussed briefly in Chapter 10, but as a rule this thesis concerns itself with radio only. When television enters the frame it is usually to show the impact that rising television viewership had on BBC radio and its conception of the value and purpose of science programming. And finally, this thesis focuses on the quarter-century between 1945 and 1970, though I do also glance back before 1945 where appropriate in order to provide social, political and scientific context for developments within the BBC. To that

³⁶ For more on the BBC's departmental structure, see Jones, "Speaking of Science," 66–68.

end, the following section consists of a short history of the BBC and its role as a public service. Since the history of the BBC has been chronicled by two official historians, Jane Seaton and Asa Briggs, the account draws extensively on their work.

1.3. *A (short) history of the BBC*

The British Broadcasting Corporation, above all else, is intended to be governed by principles of public service. The Corporation's original 1926 Royal Charter outlined this commitment to serving the public when it asserted that the duties and status of the BBC, "should correspond with those of a public service".³⁷ For the next fifty years, every committee tasked with reviewing the BBC's charter reiterated this commitment to utilizing broadcasting to serve the needs and interests of the public.³⁸

What was less clear, and what successive review committees shied away from defining, was what exactly the *goal* of 'public service broadcasting' should be, and how it should go about *achieving* these goals. The BBC was therefore given wide latitude to define exactly what the *goals* and *methods* of public service broadcasting should be. Seaton writes that "the bedrock of [the BBC's] value to our personal and collective lives" has been its commitment to 'public service' and "the discovery at any historical moment of what this might mean".³⁹ To identify how it might best serve the public at 'any historical moment', the BBC is forced to engage with the wider context and culture in which it finds itself. And as the years pass, changes in the cultural, political, and economic realities of the nation naturally lead to changes in the needs of the public, which, if the BBC is responsive to those changes, will in turn precipitate changes in its interpretation of how to best serve the public. As Seaton writes:

... adjustments and occasionally great corrections have to be made: the machine re-calibrated according to changing sensibilities, changing circumstances, mutating values, political realities and fundamental shifts in audience's desires. The interaction with the social and political environment constantly evolves.⁴⁰

³⁷ *Report of the Broadcasting Committee*, [Cmnd 2599] (Crawford Report, 1926), VIII, 327, para. 49. Cited in James Curran and Jean Seaton, *Power Without Responsibility: The Press, Broadcasting, and New Media in Britain*, 6th ed. (London; New York: Routledge, 2003), 359.

³⁸ Curran and Seaton, *Power Without Responsibility*, 359.

³⁹ Jean Seaton, "Journeys to Truth: The BBC as a Pragmatic Ethical Engineer at Home and Abroad," *Historical Journal of Film, Radio and Television* 28, no. 4 (October 2008): 441.

⁴⁰ Seaton, "Journeys to Truth," 441.

The story of the BBC during the first half-century of its existence, then, is the story of a public service broadcaster striving to define how its programming might best serve the citizens of a nation in turmoil. As such, the way in which the BBC conceived of its role during any given period would have influenced both the form and content of the science programming deemed most suitable during that period, as well as the value and ultimate goal of that programming.

During its early years – both as a company and a corporation – the BBC’s conception of its duty as a public service was largely defined by the vision and determination of its first Director-General, John (later Lord) Reith. Central to Reith’s vision for public service broadcasting was his belief that the BBC should provide listeners with ‘the best’ and elevate them into an appreciation of the finer things. Reith was part of a large group of intellectuals in the early twentieth century who hoped to harness modern methods of mass communication as a means for improving society.⁴¹ This intellectual elite would, of course, define what counted as ‘the best’. In his 1924 book, *Broadcast over Britain*, Reith defended this approach:

It is occasionally indicated to us that we [the BBC] 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.⁴²

Reith would later refer to his policy of public service broadcasting as “elevating as well as entertaining”.⁴³

In an effort to ensure that listeners’ tastes would indeed be elevated in this way, Reith resisted fixed-point scheduling – the practice of broadcasting the same, or similar types of programmes at fixed points each day – and instead shifted the schedule around from day to day and from week to week. An afternoon concerto might follow a talk about the wildlife of New Zealand, which might be followed by a cricket match. The next afternoon the schedule would be entirely different. Reith hoped that by introducing listeners to a wide range of programmes, they would gradually be awakened to more edifying pursuits.

⁴¹ Michael Bailey, “Rethinking Public Service Broadcasting: The Historical Limits to Publicness,” in *Media and Public Spheres*, ed. Richard Butsch (London: Palgrave Macmillan UK, 2007), 100; D. L. LeMahieu, *A Culture for Democracy: Mass Communication and the Cultivated Mind in Britain between the Wars* (Oxford, New York: Oxford University Press, 1988), 103.

⁴² John Charles Walsham Reith, *Broadcast over Britain* (London: Hodder & Stoughton, 1924), 34. Cited in Jones, “Speaking of Science,” 71.

⁴³ John Charles Walsham Reith, *Into the Wind* (London: Hodder & Stoughton, 1949), 299. Cited in Jones, “Speaking of Science,” 72.

In 1940, in an attempt to buoy the spirits of British troops encamped in France, the BBC launched a new network, The Forces Programme, which featured a much higher proportion of lighter fare, such as dance music and variety shows, coupled with a much lower proportion of lecture-style straight talks from eminent thinkers. The new network proved extremely successful not only with soldiers and military personnel but with civilians back home as well. By 1942 more civilians were listening to the Forces Programme than service people, and the total audience was 50 percent higher than the audience for the BBC's other network, the Home Service.⁴⁴ As the end of the war approached, a return to the pre-war status quo was thought impossible, yet governors and staff were unwilling to completely forsake their commitment to elevation and improvement.⁴⁵

The compromise BBC managers came up with was the tripartite system. In this system the Home Service would continue largely unchanged and would become the BBC's main network, offering programming that catered to the widest range of interests. The Forces Programme would be replaced by the Light Programme, which would continue to offer the same lighter fare as its predecessor. The third network, aptly and creatively named the Third Programme, would broadcast a more 'high-brow' mixture of orchestral music and opera, as well as programmes on art, literature, philosophy, and religion.

When William Haley took over as Director-General in 1942 he was tasked with selling this new tripartite system to the government and the public. He did so by casting it as a 'social pyramid'. Since there would be significant overlap between the content of all three stations it was hoped listeners would find themselves gradually moving 'up the social pyramid' from Light to Home to Third as they developed previously undiscovered appreciations and interests. Haley envisioned the three networks as "a single co-ordinated whole" devoted to the "enlightenment, entertainment, and informing of the community",⁴⁶ and was therefore adamant that there had in no way been a weakening in "the general aim of the BBC to raise public taste".⁴⁷

During the first two and a half decades of its existence, then, the BBC's conception of its duty as a public service remained much the same. The BBC fashioned itself as a public service broadcaster that was slowly but surely raising the tastes of the nation through challenging and

⁴⁴ Crisell, *Introductory History*, 55.

⁴⁵ Crisell, *Introductory History*, 55.

⁴⁶ "Broadcasting and British Life" (an Address to the British Institute of Adult Education, n.d.). Cited in Briggs, *Sound and Vision*, 4:70–71.

⁴⁷ William Haley (Address to the General Advisory Council, October 29, 1947). Cited in Briggs, *Sound and Vision*, 4:70.

edifying programming. Even in the post-war period when the tripartite system featured three separate networks and offered more entertainment than ever before, the BBC continued to view its ultimate goal to be the elevation of society through quality programming. However, as the 1950s approached, the changing cultural milieu would make it difficult for the BBC to retain its audience without reinterpreting the goals of public service broadcasting.

As the nation emerged from the war and progressed into the 1950s, there was growing resentment in many parts of society of overly restrictive government control. During the war, many functions of society had been controlled and administered by the government in the name of efficiency and the war effort. Once the war was over, however, many Britons grew tired of this continued strict control and continued rationing. Briggs writes that in the Britain of the 1950s, “there was a revulsion against the war-time system of guided information.”⁴⁸ Crisell describes it as “a reaction against [...] managed information and bureaucratic paternalism.”⁴⁹

This resentment and rejection of paternalism on the part of the public greatly influenced the BBC’s interpretation of how it could best serve that public during the 1950s. In a 1956 memorandum from Lindsay Wellington, Director of Sound Broadcasting, to Ian Jacob, Director-General of the BBC from 1952-1960, Wellington asked for Jacob’s endorsement for “an important shift of emphasis in the whole output of Sound Broadcasting”.⁵⁰ The BBC, he argued, would have to abandon “its traditional belief” that it could “compel listeners to attend to ‘better things’”.⁵¹ A Working Party convened around this time to examine the future of broadcasting agreed with Wellington’s assessment and concluded that the BBC should in the future “seek to cater for the needs and tastes of its audiences without seeking, as it perhaps had done too much in the past to alter and improve them”.⁵² Thus, over the latter half of the 1950s the BBC moved away from ‘elevation’ and ‘improvement’ – two of the guiding principles of public service broadcasting as it had been understood by the BBC over the previous three decades. Wellington and his colleagues knew that in a media environment where listeners had more choices than ever before – BBC television, ITV, Radio Luxembourg – BBC radio would have to do more to attract an audience and keep that audience tuned in. This led to a shift

⁴⁸ Briggs, *Sound and Vision*, 4:336.

⁴⁹ Crisell, *Introductory History*, 77.

⁵⁰ Lindsay Wellington, “Memorandum to Director General: Future of Sound Broadcasting,” Memorandum, (October 18, 1956), R34/1022/2, Written Archives Centre. Cited in Briggs, *Competition*, 5:38.

⁵¹ Wellington, “Memorandum to Director General: Future of Sound Broadcasting.” Cited in Briggs, *Competition*, 5:38.

⁵² “The Future of Sound Broadcasting in the Domestic Services: Report of the Working Party Set up by D.B.S. on 9th November 1956,” January 1957, R34/1021, Written Archives Centre. Cited in Briggs, *Competition*, 5:40.

towards conversational discussions of topical interests rather than formal, didactic lectures, as well as a shift towards entertainment rather than improvement – shifts that were reflected in the BBC’s science programming, as will be seen later in this thesis.

By the mid-1960s the BBC had moved even further away from Reith’s (and Haley’s) interpretation of public service broadcasting – a move that had much to do with the personality of the BBC’s Director-General from 1960 to 1969, Hugh Greene. While historians and social scientists are often ill at ease linking large institutional changes to the actions and constitutions of individuals, Seaton writes that it is clear that at times “individual characters and formations make all the difference.”⁵³ The BBC, she writes:

... inculcates values and habits, morals and judgements, yet in the end it depends and is altered by the varying ambitions, capacities and decencies of the people that it employs. People do make a difference. Changing views of public service make a difference.⁵⁴

Just as Reith had fashioned the BBC in his own image during the 1920s and 1930s, Greene too shaped the BBC according to his personal understanding of what public service broadcasting could and should be during the 1960s.

The two men were very different. Reith was a committed Calvinist who, in the words of A.J.P. Taylor, used the “brute force of monopoly to stamp Christian morality on the British people”;⁵⁵ Greene was once described by Mary Whitehouse, co-leader of the Clean Up TV campaign, as the person who “above all, was responsible for the moral collapse which characterized the sixties and seventies”.⁵⁶ Reith molded through strength and will; Greene was relaxed and liberal, and afforded his producers a freedom and flexibility unknown during Reith’s reign.⁵⁷ Reith, so the story goes, fired his chief engineer Peter Eckersley in 1929 for becoming involved with a woman before her divorce had been made official;⁵⁸ Greene eventually married

⁵³ Seaton, “Journeys to Truth,” 445.

⁵⁴ Seaton, “Journeys to Truth,” 445.

⁵⁵ Curran and Seaton, *Power Without Responsibility*, 107.

⁵⁶ Mary Whitehouse, *Whatever Happened to Sex?* (Hove: Wayland, 1977). Cited in Briggs, *Competition*, 5:309.

⁵⁷ Crisell, *Introductory History*, 108.

⁵⁸ “John Reith - History of the BBC - Corporation Man,” *BBC*, 2017, <http://www.bbc.co.uk/historyofthebbc/research/culture/reith-6>.

four times. According to one colleague the two men were a contrast of “dignity” and “impudence”.⁵⁹

Nevertheless, despite these differences both were extraordinarily committed to utilizing the BBC as a public service; their interpretation of what this meant was simply different. Reith strove to place before listeners – in a way, fill their field of vision with – only the very best that civilization had to offer – from art and music to literature and (Christian) religion – and by doing so hoped to encourage those listeners to join in these edifying pursuits. Greene, on the other hand, made no attempt to direct listeners’ attention towards ‘the best’ and instead envisioned the BBC as “a window on the world”⁶⁰ through which listeners could encounter the world as it was – inclusive of the worst *as well as* the best of modern society. This meant reporting on and engaging with the current social climate, even if it required sacrificing a portion of the ‘dignity’ which Reith so valued.⁶¹ Among those who noted the break with Reithian elevation that Greene had wrought was Reith himself. “Hugh and I were in complete opposition of outlook and attitude”, Reith wrote in his diary in 1964: “I lead, he follows the crowd in all the disgusting manifestations of the age.”⁶²

While Reith was undoubtedly correct in noting Greene’s different interpretation of public service, Greene did not merely ‘follow the crowd’ as Reith accused. In fact, Greene often spoke of broadcasting as an agent for social change and defended the BBC’s right to “be ahead of public opinion.”⁶³ In advocating that the BBC serve as an agent of change, Greene was not discarding Reith’s commitment to ‘leading’; he was refashioning it. Whereas Reith wanted to slow what he saw as troubling social trends and lead the public back towards ‘the best’ things, Greene wanted to give them a nudge in the direction they were already heading. One saw the BBC as an inhibitor, the other as a catalyst. By the end of the 1960s, the BBC had traded in much of Reith’s interpretation of the duty of the BBC as a public service, in exchange for an interpretation of public service that prized and prioritized programmes that functioned as a window onto the world and served to open up for public inspection pressing social, political, and philosophical questions.

⁵⁹ Oliver Whitley, “Dignity and Impudence,” *London Review of Books* 5, no. 18 (October 6, 1983). Cited in Briggs, *Competition*, 5:318.

⁶⁰ “Broadcasting the BBC Way,” November 13, 1961, R44/548, Written Archives Centre. Cited in Briggs, *Competition*, 5:325.

⁶¹ Briggs, *Competition*, 5:317–18.

⁶² John Charles Walsham Reith, Diary (January 20, 1964). Cited in Briggs, *Competition*, 5:317.

⁶³ Hugh Greene, *The Conscience of the Programme Director, an Address given to the International Catholic Association from Radio and Television*. (Rome, 1965). Cited in Briggs, *Competition*, 5:323.

1.4. *News versus comment*

This emphasis on opening up for public inspection led to a flowering of programmes in the 1960s that took on a more newsy, journalistic feel – a development which would have been unthinkable in previous decades. Indeed, for the first three plus decades of the BBC's existence there was a strict demarcation between 'news', which strove to present the bare facts, and 'comment' or 'current affairs', which had greater freedom to analyze and interpret. Reith had established this policy in the 1930s in an attempt to stabilize the tenuous position in which the Corporation found itself. By separating news from comment, Reith sought to reassure Fleet Street that the new broadcasting corporation posed no threat to the future of the print media while simultaneously assuring Whitehall that it would abide by its promise to avoid offering its own editorial opinion on controversial subjects. As the media historian Hugh Chignell writes, there was widespread suspicion within the early BBC that "comment or analysis might somehow contaminate the purity of news facts and as a result harm the standing of the BBC."⁶⁴

This demarcation became engrained in the very structure of the BBC with the creation in 1935 of two distinct departments: the News department and the Talks department.⁶⁵ BBC newsreaders working for the News Department might inform the British public that coal workers were striking for better wages, for instance, but they were never to go so far as to offer their own commentary or analyze the arguments of union or factory bosses. Comment and analysis belonged in the programmes put out by the Talks department. Importantly, when engaging with potentially controversial topics – or merely topics that involved opinion or analysis – the early Talks department almost exclusively turned to outside experts for the delivery of such content. A case in point is the 1946 eleven-part series *The Challenge of Our Time*, which dealt with the perceived disconnect between science and morality and included talks by author and journalist Arthur Koestler, novelist E.M. Forster, classicist Benjamin Farrington, geneticist J.B.S. Haldane, theologian V.A. Demant, biologist C.H. Waddington, crystallographer J.D. Bernal, and two summary broadcasts, one by philosopher A.D. Ritchie, and another by Lord Lindsay.⁶⁶ By recruiting prominent thinkers from various political, ideological, and philosophical backgrounds to voice their opinions on the matter, the BBC could ensure that potentially controversial opinions or comments would emanate from outside experts rather than from the BBC itself.

⁶⁴ Hugh Chignell, *Key Concepts in Radio Studies* (London: SAGE Publications Ltd, 2009), 152.

⁶⁵ Chignell, *Key Concepts*, 152.

⁶⁶ The series was broadcast on the Home Service from 3 March to 26 May 1946.

With regards to the news services put out by the BBC, this strict demarcation meant that the BBC as an institution – including its newsreaders, announcers, chairmen, producers etc. – was required to be simultaneously informative yet impartial to the point of detachment. The content of each news report was therefore carefully screened and edited to ensure that nothing was included that could give the appearance of bias. Thus, a 1931 BBC review commended the News Section for having served as a “supplier of unbiased information”, “objective non-sensational accounts”, and news “without any comment”.⁶⁷

The separation of news and comment led to – and was in part caused by – wide-spread suspicion within the BBC of journalists, ‘news men’, and news values. Indeed, according to John Carey, the cultural elite of Britain – from which the early BBC’s senior positions were often filled – had long exhibited a disdain for journalists and their ilk.⁶⁸ True to type, during the early years of the Corporation the head of the BBC’s first news section, Geoffrey Strutt, expressed a desire to expand the BBC’s news services while steering clear of newspaper journalists and avoiding the “errors into which journalists, as such, seem inevitably to fall (sensationalism, inaccuracy, partiality and overstatement)”.⁶⁹

Due in part to the prevalence of such views, there were only two dedicated radio correspondents working for the BBC at the start of the Second World War.⁷⁰ And though by many accounts the BBC had a ‘good war’⁷¹ and was able to develop its news and political coverage during the six years of fighting, the separation of news from comment remained firmly in place heading into the early post-war years. In the words of the BBC Year Book for 1946, such a separation demanded “the most rigid and absolute avoidance of expressions of editorial opinion combined with an equally rigid refusal to omit or bowdlerise any news that is of sober public interest.”⁷² As Hugh Greene put it in 1969 looking back on the early years of the BBC:

⁶⁷ “News Service, Review of the Year 1931,” n.d., 1, R28/79, Written Archives Centre. Cited in Scannell and Cardiff, *A Social History of British Broadcasting*, 45.

⁶⁸ John Carey, *The Intellectuals and the Masses: Pride and Prejudice among the Literary Intelligentsia, 1880-1939* (London; Boston: Faber and Faber Limited, 1992), 7.

⁶⁹ Strutt to Matheson, Letter, (October 14, 1927), R28/177/1, Written Archives Centre. Cited in Scannell and Cardiff, *A Social History of British Broadcasting*, 113.

⁷⁰ Chignell, *Key Concepts*, 164.

⁷¹ See Asa Briggs, *The War of Words*, vol. 3, *The History of Broadcasting in the United Kingdom* (London: Oxford University Press, 1995). Also, Chapter 2 in Hugh Chignell, *Public Issue Radio: Talks, News and Current Affairs in the Twentieth Century* (Basingstoke: Palgrave Macmillan, 2011).

⁷² British Broadcasting Corporation, *BBC Year Book* (London: Hollen Street Press, Ltd., 1946), 55. Cited in Briggs, *Sound and Vision*, 4:522.

... in those days news was news and current affairs were current affairs and never the twain should meet. They had been living in water-tight compartments for many years in an atmosphere of mutual distrust and even contempt.⁷³

The news programmes produced by the BBC during this period were criticized by many contemporary observers for being rather staid – especially when compared to the news services of other countries that did not enforce a separation between news and comment. According to Burton Paulu, a contemporary American broadcasting scholar, there was too little “analysis” within BBC news during the first decade of the post-war period: “One turns to BBC news programmes for news and nothing else!”⁷⁴ Writing in the mid-1950s, Paulu asserted that the BBC’s approach had led it to produce news programmes that were as dull as a “foreign office communiqué”.⁷⁵ As will be seen, by the mid-1950s, the barrier between news and comment would begin to crumble.

1.5. Science, the media, and the British public 1945-1970

The twenty-five years from the end of the Second World War to the dawning of the 1970s were a turbulent and transformative time for what Tim Boon has called the “cultural history of science”.⁷⁶ In 1951 the Festival of Britain could prophesy a brighter future led by scientific and technological advancement.⁷⁷ Yet by the end of the 1960s, Gerry Davis, a scriptwriter for the BBC, had to admit: “The days when you and I marvelled at miracles of science ... are over. We’ve grown up now – and we are frightened ... The honeymoon of science is over.”⁷⁸ Given that Archie Clow’s career spanned these twenty-five turbulent years, it is worth briefly tracing the relationship between science, the media, and the British public during this period.

The 1950s were a relatively good time to be a scientist in the public realm. Scientists enjoyed wide respect and international acclaim, the media were broadly supportive of scientists’ efforts to communicate science to the British public, and the public were generally optimistic

⁷³ Hugh Greene, *The Third Floor Front: A View of Broadcasting in the Sixties* (London: Bodley Head, 1969), 127. Cited in Chignell, *Public Issue Radio*, 84.

⁷⁴ Paulu, *British Broadcasting*, 159. Cited in Briggs, *Sound and Vision*, 4:522.

⁷⁵ Paulu, *British Broadcasting*, 157. Cited in Chignell, *Public Issue Radio*, 67.

⁷⁶ Boon, *Films of Fact*, 2.

⁷⁷ Sophie Forgan, “Festivals of Science and the Two Cultures: Science, Design and Display in the Festival of Britain, 1951,” *The British Journal for the History of Science* 31, no. 2 (1998): 218.

⁷⁸ Gerry Davis, *Radio Times*, n.d. Cited in Gregory and Miller, *Science in Public*, 44.

about the role science and technology were going to play in shaping the modern, post-war world. “The late 1940s and in particular the 1950s”, write Gregory and Miller, “were celebratory times for science” during which scientists enjoyed opportunities as both “celebrant and celebrity.”⁷⁹

The media played a leading role in this celebration of science. Gregory and Miller write that during the early post-war period “the morale-boosting, optimistic rhetoric that carried readers through the war persisted, and the accelerated technological achievements of the war years were celebrated in similarly upbeat terms.”⁸⁰ Furthermore, Martin Bauer and Jane Gregory estimate that between 1950 and 1962 the number of articles with scientific or technological contents in *The Daily Telegraph* rose from around 2,000 to over 7,000 per year.⁸¹ These celebratory and up-beat framings were made possible by the fact that many in the media were sympathetic to scientists’ goals for popularization. Tim Boon, for instance, has shown that during the early post-war period BBC staff, “whilst wary about scientific control, were universally respectful of science and scientists.”⁸²

The public, too, were generally optimistic about science and the benefits it was sure to bestow upon society in the coming years. Indeed, Bowler refers to the early 1950s as a period of “naïve optimism” on the part of the public.⁸³ This is not to say, however, that public concerns were non-existent. Thus, while a 1946 Mass Observation survey found that 49% of a London borough felt mankind was indeed progressing – 51% of whom felt it was doing so thanks to science and medicine – another 30% disagreed and pointed to “war, and the abuse of science” as the reason why.⁸⁴ Further, Bruce Lewenstein has argued that the idea of a popular demand for science came primarily from scientists themselves. “Moral certainty in the importance of science”, writes Lewenstein about the American context, “allowed leading scientists to focus on meeting a ‘demand’ for information about science despite a lack of evidence that the demand existed.”⁸⁵

⁷⁹ Gregory and Miller, *Science in Public*, 38.

⁸⁰ Gregory and Miller, *Science in Public*, 38.

⁸¹ Martin W. Bauer and Jane Gregory, “From Journalism to Corporate Communication in Post-War Britain,” in *Journalism, Science and Society: Science Communication between News and Public Relations*, ed. Martin W. Bauer and Massimiano Bucchi (Abingdon: Routledge, 2007), 34.

⁸² Boon, *Films of Fact*, 186.

⁸³ Bowler, *Science for All*, 273.

⁸⁴ Mass Observation, *Puzzled People* (London: Victor Gollancz, 1947), 130.

⁸⁵ Bruce V. Lewenstein, “The Meaning of ‘Public Understanding of Science’ in the United States after World War II,” *Public Understanding of Science* 1, no. 1 (January 1, 1992): 48.

By the end of the 1960s, much of this had changed: scientists no longer enjoyed a celebratory national spotlight; many journalists were less sympathetic to science and no longer conceived of science in unproblematic terms as an unquestioned good; and many members of the public had grown concerned over the effects of some of the very technologies which had previously been viewed with optimism. For Gregory and Miller, this shift was:

... partly a response to the disappointment that followed the pro-science euphoria of the immediate post-war period and partly a response to perceived failures of technology, especially with regard to energy and the environment.⁸⁶

As the public grew increasingly concerned, newspaper coverage of science became increasingly negative and critical. Bauer and Gregory find that the tone of science coverage in *The Daily Telegraph* reached a peak of positivity in the late 1950s, but grew increasingly negative over the next decade.⁸⁷ A feature article on science published in the late 1960s was just as likely to challenge, critique or condemn science as it was to endorse or applaud it.

This period also witnessed the rise of a new type of professional journalist: the science journalist. Indeed, Gregory and Miller suggest that popular science in the post-war period can best be characterized by “the rise and rise of the science journalist.”⁸⁸ Whereas during the 1930s science journalist Ritchie Calder supposed himself one of only three journalists or writers in Britain specializing in science, by 1947 there were enough science journalists and science writers to warrant the founding of the Association of British Science Writers.⁸⁹ According to Gregory and Miller, the rise of the science journalist was aided by the fact that professional scientists were ill at ease in the post-war climate, and were ultimately ill-equipped to navigate the post-war media context.⁹⁰ Thus, as science journalists grew in number and power, scientists were only too happy to see them take over as the popularizers and communicators of science. Science journalists, writes Bowler, seemed to offer “the hope that in the area where the scientists themselves found it most difficult to communicate, the job could be done for them by sympathetic scribes.”⁹¹

But this enthusiasm and sympathy only lasted so long. Lewenstein notes that by the 1960s science journalists were starting to think of themselves less as “advocates for science” as

⁸⁶ Gregory and Miller, *Science in Public*, 45.

⁸⁷ Bauer and Gregory, “From Journalism to Corporate Communication in Post-War Britain,” 35.

⁸⁸ Gregory and Miller, *Science in Public*, 38.

⁸⁹ Gregory and Miller, *Science in Public*, 38.

⁹⁰ Gregory and Miller, *Science in Public*, 38.

⁹¹ Bowler, *Science for All*, 265.

they had done during the 1950s, and more as professional journalists.⁹² Henry Pierce of the *Pittsburgh Post Gazette*, for instance, observed that while other journalists maintained a healthy skepticism towards their news sources, “we, bless us, go in with our bright baby-blue pencils poised, faithfully recording anything our scientists – gods – tell us. Never does it occur to us that these guys too may have motives that are less than noble.”⁹³ Increasingly, “journalists’ traditional deference towards scientists”, write Bauer and Gregory, became “coloured by their professional ethos of independence.”⁹⁴ With this new ethical commitment to truth, independence, and skepticism came a willingness – perhaps even a responsibility – to reflect current public concerns about science and technology. Thus, Bowler writes that “as public concerns grew, [science journalists] had to articulate those concerns even if they seemed to threaten the interests of the technocrats who employed the scientists.”⁹⁵

In response to this increased criticism and skepticism, many scientists retreated from the public sphere and became increasingly isolated within their own close-knit communities. The scientific community, according to Christopher Dornan, increasingly shunned science journalists whom they viewed as “exploiting science as a source of startling narratives”.⁹⁶ To be a scientist was to research; popularization – if it had to be done at all – was something to be reserved for scientists who were past the productive research stage of their career or for a few select ‘visible scientists’.⁹⁷ By isolating themselves, however, scientists were relegated to a position one step removed from the public sphere, and thus lost their seemingly-direct link to the public. Whereas the scientist-communicators of the early post-war period had been able to convey their thoughts and concerns to the British public with relatively little input from intermediaries or translators, by the close of the 1960s scientists were largely reliant upon members of the media to convey their messages to an increasingly skeptical public.

Within just twenty-five years the context for popular science changed from one characterized, broadly speaking, by active scientists, sympathetic media, and a generally optimistic populace, to one characterized increasingly by isolated scientists, critical media, and a more disillusioned public. By examining how the relationship between scientist-communicators

⁹² Lewenstein, “The Meaning of ‘Public Understanding of Science’ in the United States after World War II,” 57.

⁹³ NASW, *Newsletter*, March 1966. Cited in Dorothy Nelkin, *Selling Science: How the Press Covers Science and Technology*, Revised ed. (New York: W.H. Freeman and Company, 1995), 89.

⁹⁴ Bauer and Gregory, “From Journalism to Corporate Communication in Post-War Britain,” 38.

⁹⁵ Bowler, *Science for All*, 274.

⁹⁶ Christopher Dornan, “Some Problems in Conceptualizing the Issue of ‘Science and the Media,’” *Critical Studies in Mass Communication* 7, no. 1 (March 1, 1990): 48–49.

⁹⁷ Rae Goodell, *The Visible Scientists*, 1st ed. (Boston, Mass: Little Brown, 1977).

and BBC producers changed over the course of this period – i.e. from a time when the interests of scientist-communicators and producers were broadly aligned to a time when they diverged – this thesis uncovers the varying motivations of producers and scientists with regards to popular science programming and how that programming changed as a result of this changing dynamic.

1.6. Chapter by chapter overview

This thesis is composed of two parts. After a short biographical chapter (Chapter 2), Part I lays out the approach to science programming that the BBC developed during the first decade of the post-war period, and details the role Clow played in helping to define and implement that approach. Part II proceeds to detail the ways in which the BBC slowly moved away from this approach over the next decade and a half. While the thesis as a whole takes a broadly chronological approach, each chapter is largely focussed around Clow's work for a particular service or the production of one or two prominent series. Since Clow was usually working on multiple programmes for different services simultaneously, there is therefore a degree of chronological overlap between chapters. To help make sense of these departmental and chronological overlaps, the charts below trace Clow's career trajectory (Figure 2), the numerous long-running series he produced (Figure 3), and the careers of other personnel involved in the production of spoken-word science programming for BBC radio during this period (Figure 4).

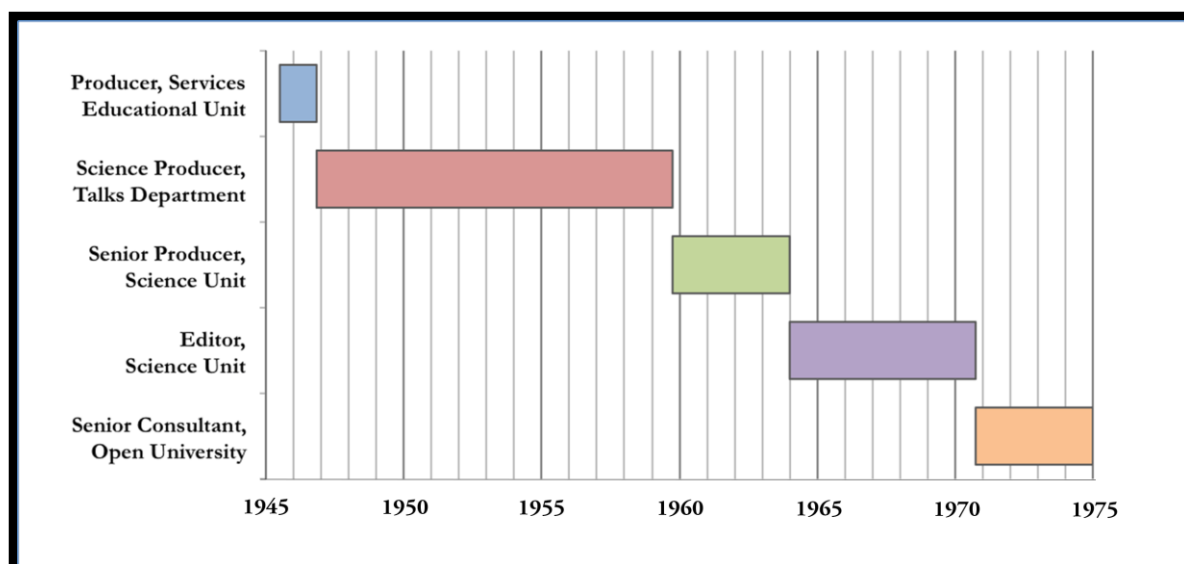


Figure 2: Clow's post-war career.⁹⁸

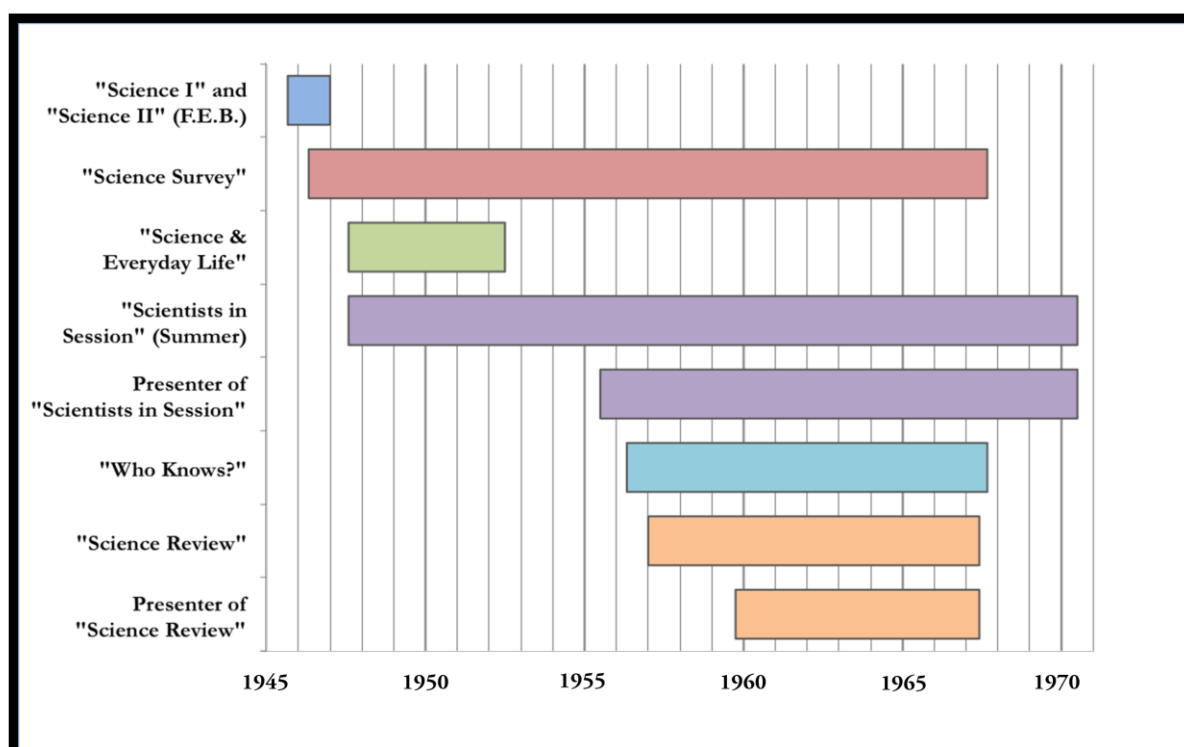


Figure 3: A timeline of the numerous long-running series produced by Clow.

⁹⁸ The Written Archives Centre does not possess a personnel file for Archie Clow. The dates included in this chart and the two that follow are estimates based on information contained in internal memoranda and departmental reports.

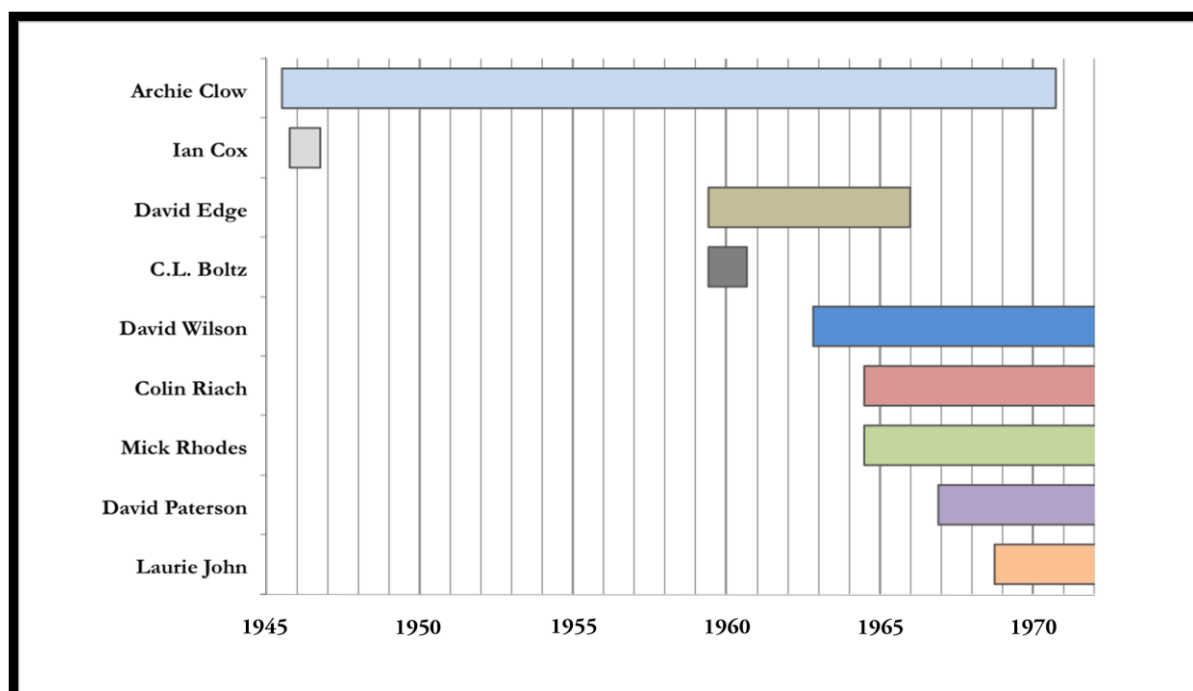


Figure 4: Other BBC personnel involved in the production of spoken-word science programming.

In order to fully appreciate the factors influencing Archie Clow's approach to science broadcasting, Chapter 2 traces his intellectual development in Aberdeen in the years before he arrived at the BBC. The chapter includes a brief biographical sketch of Clow's early years and then examines his views regarding the nature of scientific and societal advancement, including the influence that Lancelot Hogben and Lewis Mumford had on the development of those views. Clow's views as to what type of information about science should be communicated to the British public are then discussed in depth, as are his views as to the style or method of presentation he felt should be used. Here again, Hogben appears to have played an important role. Finally, the chapter discusses Clow's involvement with the Aberdeen Scientific Film Club and his early efforts to educate the Scottish public about the value and importance of science.

Chapter 3 serves as the first chapter of Part I and thus marks the beginning of the exploration of the BBC's approach to science programming during the first decade of the post-war period. Clow began his broadcasting career in 1945 developing programmes for the forces within the BBC's Services Educational Unit (SEU). After a survey of the first programmes Clow produced for the forces, the chapter goes on to examine one of Clow's first long-running series, *Science & Everyday Life* (1947-1952) – a series that was nominally aimed at forces listeners but which attracted a large audience of Light Programme listeners as well. Throughout the series

Clow presented an image of science to the British public that was heavily influenced by the functionalist approach of Lancelot Hogben. The chapter concludes by looking at the ways in which Clow took advantage of the SEU's openness to different presentation styles and details the results of an experiment conducted by his wife, Nan Clow, which aimed to identify the style of presentation preferred by forces listeners.

Clow drew on his experiences in the SEU when he set out to overhaul the series *Science Survey* (1946-1967) in the autumn of 1946. Chapter 4 details his attempt to institute what he promised would be a novel and revolutionary approach to science programming. When *Science Survey* launched in the spring of 1946, figures from both the scientific world and the BBC had expressed their confidence that: 1) there was a popular demand for information about science, 2) practicing scientists should be the ones to deliver that information rather than science journalists, and 3) scientists were eager to take on the task of communicating science to the British public. Clow's time in the SEU had convinced him of the first point, but had given him reason to doubt the last two. The chapter provides an overview of the approach Clow wanted to institute and examines management's reasons for rejecting that approach. The chapter ends with a discussion of the tensions between public service and institutional interests that are revealed by Clow's experience with *Science Survey*.

Since Chapters 3 and 4 examine science series on the Light Programme and Home Service respectively, Chapter 5 serves to complete the trek up Haley's tri-part pyramid. By tracing Clow's work for the Third Programme, the chapter provides an overview of the role of a BBC producer when developing science programmes for the BBC's most 'high-brow' audience. As this chapter shows, science was far from an afterthought, and was in fact a crucial element of the BBC's plans for its third network. The chapter includes an overview of the form and content of the science programmes broadcast on the Third during the first decade of the post-war period and examines the criteria against which these science programmes were judged. The chapter demonstrates that the planners of the Third early on accepted that only a small percentage of listeners would ever be able to understand its broadcasts – including its broadcasts on science.

Chapter 6 pauses to provide an overview of the BBC's approach to science programming over the first decade of the post-war period. The chapter returns to *Science Survey* to detail Clow's aims for the series during this decade, and shows that in contrast with his first years at the BBC, by the mid-1950s Clow was fully committed to using scientists themselves in the delivery of science programmes. The chapter then provides a cross-section of the myriad other science

programmes broadcast on BBC radio during the spring of 1949. This helps to situate Clow's work during this decade within its proper context. Central to this context is the BBC's conception of the audiences for its three separate services, and the way in which the BBC came to define the content and presentation style deemed suitable for each network. The chapter concludes by showing that the mid-1950s saw a drop in output for the Light Programme, whose audience was deemed least able to cope with unmediated scientists.

Chapter 7 serves as the first chapter of Part II and traces the BBC's shift to a more mediated approach to science programming during the mid- to late-1950s. The chapter begins by detailing four years of failed attempts by the Light Programme to develop a science series deemed suitable for the Light Programme audience. The solution came in the form of *Who Knows?* (1956-1967), a series developed by Clow which featured a chairman who functioned as a 'mediator' by interpreting for listeners and keeping scientists on track. It was not just the Light Programme that began emphasizing mediation around this time; so, too, did the Home Service. This is shown by examining another Clow series, *Science Review* (1957-1967), and tracing its transition from a series of lecture-style straight talks through to a magazine-style series composed of interviews conducted by a chairman serving in a mediatory role.

Interviews also became increasingly important within news broadcasting during this period and changes in the BBC's treatment of news had an impact on the science programming put out by Corporation. Chapter 8 traces the increasing emphasis placed on science within news, topical, and current affairs programming from the last years of the 1950s through the first half of the 1960s. It begins with an overview of the demarcation between news and current affairs programming during the late 1940s and early 1950s, then focuses on C.L. Boltz, a science writer and science journalist who in 1959 became the first Science Correspondent employed by BBC radio's domestic services. The chapter considers the importance and symbolism of the BBC employing a science correspondent and examines Archie Clow's views on the matter. Clow very early on understood that hiring a science correspondent signaled a drastic shift away from the BBC's approach to science programming since the end of the war. The chapter ends by tracing the movement within the wider BBC during the 1960s towards a more probing, journalistic style.

Chapter 9 examines the impact this journalistic approach had on the framing and tenor of science programming during the latter half of the 1960s. The chapter looks specifically at *Scientifically Speaking* (1965-1968) – a series which embraced the style of unscripted, probing interview that grew increasingly common during the latter half of the 1960s. For scientists, this

new type of interview marked a loss of control compared to the scripted talks with which they had become familiar. *New Worlds* (1967-1973) took the journalistic approach a step further and demonstrated a willingness to critique science and scientists. Envisioned as a ‘science news’ series, *New Worlds* was pitched, developed, and overseen not by Archie Clow but by Mick Rhodes, another science producer in the BBC Talks department and a member of the ‘new guard’. In the mid-1950s Clow had described himself as a scientific impresario. By the mid-1960s science producers like Rhodes had begun to see themselves as journalists. Rather than providing a platform from which scientists could popularize science, this new guard prioritized programmes that brought important issues involving science out into the open for public inspection and discussion.

New Worlds exemplifies the trends examined in this thesis – trends which continue to have relevance to current debates about the nature of science communication. The conclusion considers some of the recurring features of these debates. Contrasting Mick Rhodes’ approach with Clow’s conception of science broadcasting a quarter-century earlier highlights the key issues that have informed the development of science programming. Two enduring themes emerge, which are discussed in turn: the changing conception of the value and purpose of science programming, and the degree of control that scientists can expect to exert over media treatments of science. After a brief discussion of science programming in the 1970s, and the opportunities for further research that this affords, the thesis ends with some final words about Clow’s life and career after he left the BBC.

Chapter 2:

The Making of a Science Broadcaster

Before this thesis takes up the task of examining the BBC's changing approach to science programming during the first quarter-century of the post-war period, it is necessary to trace the intellectual and ideological outlook of the man who guided science programming during that period. This chapter therefore looks at Clow's early career in Aberdeen and the ideas and thinkers, especially Lancelot Hogben, who shaped his intellectual development as a young man. This will entail a digression into the obscure field of social technology, but this proves essential for understanding Clow's functionalist perspective on the relationship between science and society.

2.1. An Aberdonian chemist

Born in Aberdeen on 11 January 1909, Archibald Clow received his PhD at 25 years old from Aberdeen University. His father, also Archibald Clow, worked as a civil servant in the Aberdeen Post Office for 43 years, but the younger Archibald – Archie, as he liked to be called – had chosen to pursue a career in analytical chemistry. Soon after submitting his PhD thesis on “urea and thiourea derivatives”¹ he secured a teaching assistant position at his alma mater – which included a period as a Carnegie Teaching Fellow² – and set to work on his DSc. In 1940 he would finish this research, entitled ‘The Chemical Constitution and Diamagnetism of Sulphur’.³ Archie would remain at Aberdeen throughout the war, perhaps because both University lecturing and research chemistry were reserved occupations.

¹ Archibald Clow, “Diamagnetic Investigation of Urea and Thiourea Derivatives” (PhD Thesis, Aberdeen University, 1934).

² Archibald Clow and James M.C. Thompson, “The Diamagnetism of Organic Sulphur Compounds,” *Transactions of the Faraday Society* 33, no. 0 (January 1, 1937): 904.

³ Archibald Clow, “The Chemical Constitution and Diagnetism of Sulphur” (DSc Thesis, Aberdeen University, 1940).



Figure 5: Archie receiving his DSc in 1940.⁴

At some point during this period, Archie met Nan Louise Helmrich, a chemist in her own right who, after a stint in the university library, had worked as an industrial chemist for one of the largest food laboratories in Scotland.⁵ The chemistry was undeniable; the two married in 1936 and welcomed a daughter in 1942. During their 36 years of marriage they would write a number of journal articles and a 680-page book together, would help found the Aberdeen Scientific Film Club (one of the first of its kind in Britain), would co-produce a series of science programmes for BBC radio, and would edit a series of popular science books for Penguin Books.

⁴ *Aberdeen Weekly Journal*, July 18, 1940, 3.

⁵ "Two Scientists Win Edinburgh Prize," *Aberdeen Press and Journal*, July 7, 1945, 4.



Figure 6: The newlyweds on their wedding day in 1936.⁶

⁶ *Dundee Courier and Advertiser*, September 11, 1936, 8.

In the summer of 1937, Archie and Nan attended the inaugural public lecture of one of the university's newest professors, the zoologist and science writer, Lancelot Hogben. According to Hogben's own 'unauthorised autobiography', the lecture dealt with "the efflorescence of scientific activity in Birmingham and Scotland during the second half of the eighteenth century" and with "the interrelations between Birmingham industry and Scottish science during that period."⁷ Had the young Aberdonian chemists decided to go to the cinema that night or to stay in with the latest best-selling novel, Archie's career might have been very different. As it was, the Clows attended the lecture, and, to hear Hogben tell it, the contents of the lecture "quickened [in the Clows] an interest in a hitherto little explored aspect of the history of science."⁸ Hogben wrote that the lecture was "the start of several friendships"⁹ and described his first encounter with Archie Clow:

Resplendent in kilt and sporran worn by several of the staff and students at the time, one of my audience [...] was Archibald Clow, who became director of science talks for the London B.B.C.¹⁰

Over the next few years the Clows and Hogbens appear to have co-mingled their personal as well as professional lives. Hogben described the Clows as "the nucleus of a younger set who foregathered on Sunday nights to drink Scotch or sherry with my own staff and post-graduate students."¹¹ In his biography of Hogben for the Royal Society, the zoologist G.P. Wells explained that these get-togethers often took on a relaxed atmosphere and were designed for those "to whom whisky and uninhibited conversation appealed."¹² "His manner towards his students was informal", Wells wrote of Hogben and his group of devotees, "he liked them to address him as 'Uncle Lancelot', and several of the professoriate thought him deficient in proper class-consciousness."¹³

At some point during these years, Hogben was able to help the Clows secure a grant to research the origins of industrial chemistry in Scotland and Birmingham during the late

⁷ Lancelot Thomas Hogben, Adrian Hogben, and Anne Hogben, *Lancelot Hogben, Scientific Humanist: An Unauthorised Autobiography* (Woodbridge, Suffolk: Merlin Press, 1998), 148. The book was written by Lancelot Hogben, but only published after his death.

⁸ Hogben, Hogben, and Hogben, *Hogben, Scientific Humanist*, 148.

⁹ Hogben, Hogben, and Hogben, *Hogben, Scientific Humanist*, 148.

¹⁰ Hogben, Hogben, and Hogben, *Hogben, Scientific Humanist*, 148.

¹¹ Hogben, Hogben, and Hogben, *Hogben, Scientific Humanist*, 149.

¹² G. P. Wells, "Lancelot Thomas Hogben. 9 December 1895-22 August 1975," *Biographical Memoirs of Fellows of the Royal Society* 24, no. 0 (November 1, 1978): 202.

¹³ Wells, "Lancelot Thomas Hogben. 9 December 1895-22 August 1975," 202.

eighteenth and early nineteenth centuries.¹⁴ In 1942, the Clows published their first article on this research in the *Economic History Review*, gratefully acknowledging “the enthusiastic interest of Professor Lancelot Hogben”.¹⁵ By 1945 the Clows had expanded this research into *The Chemical Revolution*, a 680-page book that argues convincingly that the “evolution of chemical industry must be regarded as an important concomitant of the Industrial Revolution”.¹⁶ Although the book itself was not published until 1952 – due in part to the post-war paper shortage in Britain¹⁷ – the manuscript for the book was awarded the 1945 Senior Hume Brown Prize for Scottish History. The book, the ideas encapsulated in it, and the influences reflected in it, are key to understanding not only Archie’s conception of science and its role in society, but his conception of why and how science should be communicated to the British public.

2.2. *On the threshold of a new age*

Not surprisingly, Hogben was the first person the Clows thanked in the acknowledgements section of their book: “Many aspects of our material were developed and extended through happy intercourse with our erstwhile colleague Lancelot Hogben”.¹⁸ How exactly Hogben helped ‘develop and extend’ the Clows’ work can be seen by examining Hogben’s statements about the nature of scientific and societal advance, many of which are spread across the 647 pages of his 1936 book, *Mathematics for the Million*,¹⁹ and the nearly 1,100 pages of his 1938 book, *Science for the Citizen*.²⁰ Both books advance similar views, but this chapter focuses on the latter – in part because Archie Clow served as a reviewer for *Science for the Citizen* before it was published.²¹ Throughout *Science for the Citizen*, Hogben expressed his belief that science had proven to be one of the greatest forces for advancement in the history of mankind and that recent developments in science had carried mankind to the threshold of a new age – an

¹⁴ Hogben, Hogben, and Hogben, *Hogben, Scientific Humanist*, 149.

¹⁵ Archibald Clow and Nan Louise Clow, “Lord Dundonald,” *The Economic History Review* a12, no. 1–2 (October 1, 1942): 47–58.

¹⁶ Archibald Clow and Nan Louise Clow, *The Chemical Revolution: A Contribution to Social Technology* (London: Batchworth Press Limited, 1952), xi.

¹⁷ The *Press and Journal* wrote: “Owing to the shortage of paper the book is not expected to be published for about nine months.” It would be another seven years, however, before the book was published. “Two Scientists Win Edinburgh Prize,” 4.

¹⁸ Clow and Clow, *The Chemical Revolution*, xv.

¹⁹ Lancelot Hogben, *Mathematics for the Million* (London: G. Allen & Unwin, 1936).

²⁰ Lancelot Hogben, *Science for the Citizen: A Self-Educator Based on the Social Background of Scientific Discovery* (London: George Allen and Unwin Ltd., 1938).

²¹ Hogben, *Science for the Citizen*, 11.

‘age of plenty’, as he called it.²² Science had accumulated so many new methods of mastering nature for the benefit of mankind, Hogben argued, that it was possible to dream of moving from the Industrial Revolution and its industries defined by coal and inefficient machinery, to a new age defined by hydroelectricity, light alloys, biotechnology, and synthetic materials. “Science can do more with the power that drives the watermill than with a blast furnace”, Hogben wrote: “We shall be making the fullest use of it when we pass out of the age of coal and iron into the age of hydroelectricity and light metals.”²³

Most importantly, in such an age, humanity would no longer be circumscribed by the limits of nature since coming advancements in science would have the capacity to produce seemingly inexhaustible “universal”²⁴ or “synthetic substitutes”.²⁵ As Hogben explained in *Science for the Citizen*:

Every advance of science makes man less dependent on local materials. We know the nature of the dyes and drugs which were once obtained exclusively from animals and plants, and we manufacture them from substances like coal which are more widely distributed. If we cared to do so, we could make them from substances which are universally distributed.²⁶

Biotechnology, in particular, promised to enable humanity to move beyond these limits by enabling the construction of a “rationally planned ecological system.”²⁷ “We are now witnessing the beginnings of a biotechnical revolution that will relegate the Law of Diminishing Returns to the same limbo as phlogiston”, Hogben declared.²⁸ This idea that mankind was poised to move ‘beyond nature’ by synthesizing new materials, new crops, new metals, and new medicines that did not rely on natural materials appears to have had a tremendous impact on Clow, and not only shaped his and Nan’s historical research but would also influence much of Clow’s work at the BBC – especially his work for the SEU (see Chapter 3).

The Clows’ work in *The Chemical Revolution* also reflects the influence of another well-known writer from this era: the historian, sociologist, and philosopher of technology, Lewis Mumford. Mumford, like Hogben, believed that science was a major force for change in society,

²² Hogben, *Science for the Citizen*, 448.

²³ Hogben, *Science for the Citizen*, 471.

²⁴ Hogben, *Science for the Citizen*, 919.

²⁵ Hogben, *Science for the Citizen*, 1082.

²⁶ Hogben, *Science for the Citizen*, 358.

²⁷ Hogben, *Science for the Citizen*, 971.

²⁸ Hogben, *Science for the Citizen*, 919.

and that mankind was on the threshold of a new age thanks to recent advances in science. In writing *The Chemical Revolution*, the Clows adopted Mumford's approach to the history of civilization as well as his terminology of 'technics'. As the Clows write in their introduction:

Since Mumford's *Technics and Civilization* is perhaps the only study that regards society from a standpoint comparable with our own, his influence on the evolution of our thesis is not unnaturally discernible. We acknowledge this inspiration wholeheartedly.²⁹

Conveniently, the Clows offer a "condensed citation" from Mumford's *Technics & Civilization* which not only summarizes Mumford's views, but serves to show what the Clows took to be the most salient points from Mumford's extensive writings:

One can divide the development of the machine and machine civilization into three successive but overlapping and interpenetrating phases: eotechnic, paleotechnic, neotechnic. ... Speaking in terms of power and characteristic materials, the eotechnic phase is a water-and-wood complex: the paleotechnic phase is a coal-and-iron complex, and the neotechnic phase is an electricity-and-alloy complex. ... The dawn-age of our modern technics stretches roughly from the year 1000 to 1750.³⁰

After 1750, according to Mumford, "industry passed into a new phase, with a different source of power, different materials, different social objectives."³¹

Though this transition from eotechnic to paleotechnic around 1750 had been profound and had benefitted humanity, Mumford promised that civilization would undergo an even more profound transformation when it moved from the paleotechnic to the neotechnic. Once civilization had moved fully into the neotechnic phase, Mumford declared, men would be:

... back once more in the Edenlike state in which they have existed in regions of natural increment, like the South Seas: the ritual of leisure will replace the ritual of work, and work itself will become a kind of game. That is, in fact, the ideal goal of a completely mechanized and automatized system of power production: the elimination of work: the universal achievement of leisure.³²

²⁹ Clow and Clow, *The Chemical Revolution*, xiv.

³⁰ Clow and Clow, *The Chemical Revolution*, xiii–xiv. The Mumford quotes are taken from: Lewis Mumford, *Technics and Civilization*, 7th ed. (London: Routledge & Kegan Paul, 1934), 109–11.

³¹ Mumford, *Technics*, 151.

³² Mumford, *Technics*, 279.

Both Hogben and Mumford, then, viewed the last two hundred years as an age of unprecedented scientific and cultural advance, and both were agreed that science had carried society to the threshold of another great age. This idea would underpin the Clow's work on *The Chemical Revolution*.

2.3. *Social Technology*

In writing *The Chemical Revolution*, the Clows were ultimately attempting to produce something greater than a standard history of Scottish industrial chemistry during the late eighteenth and early nineteenth centuries. A clue to this deeper pursuit, which also provides an important insight into Archie's intellectual development and his later approach to science broadcasting, can be found in the full title of the book: *The Chemical Revolution: A Contribution to Social Technology*. Unfortunately, 'social technology' is one of those concepts – found so often in intellectual history – that never quite caught on, and as a result has become more confused and difficult to define as the years have gone by. The American sociologists Albion W. Small and Charles Richmond Henderson are traditionally credited with coining the term in the waning years of the nineteenth century, but on the western-side of the Atlantic the term came to be used primarily as a synonym for applied sociology – i.e., as a term for the application of sociological knowledge to society in an attempt to effect change.³³ As will be seen, this is not quite the manner in which the Clows conceived of social technology. This confusion is further exacerbated by the fact that although the Clows include the term in the subtitle of their book, at no point in *The Chemical Revolution* do they provide a working definition of 'social technology' – instead they use the term as if its meaning were self-evident, and make no reference to previous uses.

One of the few clues as to the origins of the term comes from the acknowledgements section of the book where the Clows thank Hogben for his help. "He ungrudgingly gave of his time and energy so that we might deepen our understanding of social technology", they write.³⁴ The term, then – as far as the Clows' usage of it is concerned – would seem to be related to the work of Lancelot Hogben.

³³ Maarten Derksen and Tjardie Wierenga, "The History of 'Social Technology', 1898–1930," *History and Technology* 29, no. 4 (December 2013): 10.

³⁴ Clow and Clow, *The Chemical Revolution*, xv.

Hogben does not use the term ‘social technology’ very often, and like the Clows does not appear to have offered a full definition of the term, but a close reading of Hogben’s work during the 1930s shows that the term is in many ways the technological analogue to his more widely-known ‘social biology’. Therefore, when one has grasped Hogben’s conception of social *biology*, one has gone a long way towards understanding social *technology*.

Social biology was an attempt during the early 1930s to achieve “a closer unification of biological and social science”.³⁵ Specifically, social biology was Hogben’s attempt to disentangle the complex set of forces acting upon the evolution of human societies. Evolutionary biologists had made great strides in determining the genetic factors that had shaped the evolution of human societies over millennia, but Hogben argued that they had failed to conclusively identify which realities of human societal evolution were due to genetic factors, and which were due to social factors. After being appointed to the new chair of Social Biology at the London School of Economics in 1930, Hogben gave a highly anticipated introductory lecture during which he argued that the biologist would need to “co-operate with the sociologist, the economist and the statistician”³⁶ to develop new methods of social scientific research that would be capable of identifying “the significant factors which determine the growth of human populations.”³⁷ Crucially, Hogben informed his new colleagues – most of whom would have been social scientists – that the social sciences could “no longer progress within the framework of a philosophical tradition”,³⁸ and would need to adopt not only the empiricism of biology, but the language of biology as well. Only when the social sciences were placed side by side with biology and genetics within the same “mechanistic framework”³⁹ could social biologists begin to disentangle the social and genetic factors influencing the evolution of human societies.

Hogben’s efforts were not restricted to matters of biology and sociology, however. “I would venture to go further”, Hogben told his audience, “and suggest that the predictions of no branch of social science can attain a high measure of precision until the various departments of

³⁵ Lancelot Hogben, “The Foundation of Social Biology,” *Economica*, no. 31 (1931): 6.

³⁶ Hogben, “The Foundation of Social Biology,” 23.

³⁷ Hogben, “The Foundation of Social Biology,” 23.

³⁸ Hogben, “The Foundation of Social Biology,” 6.

³⁹ Hogben, “The Foundation of Social Biology,” 16.

social investigation are integrated with a genuinely scientific analysis of human conduct.”⁴⁰ This formed the core of what he would later refer to as his new “science of society”.⁴¹

By the time he left the LSE for Aberdeen in 1937, Hogben was writing about the need for the social sciences to adopt a new set of goals. The natural sciences, he noted in *Science for the Citizen*, had long ago accepted Bacon’s dictum that “the true and lawful goal of the sciences is none other than that human life be endowed with new powers and inventions.”⁴² In keeping with his effort to place the social sciences on an equal footing with the natural sciences, Hogben argued that the “true and lawful goal of the *social* sciences” was therefore, “that human life be endowed with new discoveries of *social* organization to use our newly-found knowledge of nature.”⁴³ “The social sciences”, stated Hogben boldly in *Science for the Citizen*, “cannot hope to enjoy the same prestige [as the natural sciences] till they can also show us how to change the world.”⁴⁴

To judge the efficiency of different technological systems and social institutions Hogben stated his intention to develop an economic system based on the laws of thermodynamics. He was confident that by ensuring that social scientists and natural scientists expressed their research in “one system of measurements” a new science of society would be able to “cost the relation between socially organized human activity and resources available for satisfying the common needs of mankind.”⁴⁵ Such a costing system would be based not on money, but on energy. In comparing the efficiency of two methods of producing corn, for instance, a “social balance sheet”⁴⁶ could be drawn up wherein one side would contain “the debt of calories equivalent to human effort expended” during the process of planting, growing, and cultivating the corn, while the other would contain “the credit of calories in available sources of energy liberated”.⁴⁷

‘Social technology’ was born of these efforts to bring into being a new science of society. Among other things, social technology was an attempt to:

⁴⁰ Hogben, “The Foundation of Social Biology,” 17.

⁴¹ Lancelot Hogben, “Prolegomena to Political Arithmetic,” in *Political Arithmetic: A Symposium of Population Studies*, ed. Lancelot Hogben (Routledge, 2013), 46.

⁴² Hogben, *Science for the Citizen*, 622.

⁴³ Hogben, *Science for the Citizen*, 622. Emphasis added.

⁴⁴ Hogben, *Science for the Citizen*, 622.

⁴⁵ Hogben, *Science for the Citizen*, 621.

⁴⁶ Hogben, *Science for the Citizen*, 622.

⁴⁷ Hogben, *Science for the Citizen*, 621. For a more in-depth discussion, see Hogben, “Prolegomena to Political Arithmetic”; also see Chapter XII in Hogben, *Science for the Citizen*.

- merge the knowledge and expertise of the social scientist with that of the technologist or engineer;
- identify the social and technical factors that influence the evolution of technology and, vice versa, identify the effect of technology on the evolution of human society;
- develop an economic costing system based on the laws of thermodynamics that would be capable of analyzing the efficiency of simple machines or complex technological systems in terms of human labor and energy; and
- discover the most efficient ways and means of organizing society in order to ensure that any new technologies developed by science would be properly utilized for the satisfaction of human needs.

Hogben acknowledged the fact that his science of human society was not yet mature, and would therefore need to conduct a great deal of empirical research. Crucially, the research needed to come *before* any attempt could be made to devise social policy. Drawing inspiration from the *Heads of Enquiries* drafted by the founders of the Royal Society, Hogben argued that the new science of society would need to “start with heads of enquiries rooted in the common experience of practical affairs, proceeding by patient examination of innumerable facts”.⁴⁸ This was the task the Clows set themselves in researching and writing *The Chemical Revolution*.

Indeed, Hogben’s influence can be felt from the first sentences. “This book is a synthesis”, write the Clows in the introduction: “It is an attempt to create something new out of hitherto unexplored ground common to economic history and chemical technology.”⁴⁹ And later:

Clearly a proper understanding of the developments with which this book deals calls for a closer cooperation between the trained historian and the scientific worker in the laboratory. We have written it with this in mind.⁵⁰

Following Hogben’s example, the Clows took the opportunity to attempt to extend the boundaries of their new discipline, noting: “Chemistry has a utility outside the academic laboratory; social technology ought to have a vital place in the studies of those who profess familiarity with sociology.”⁵¹ They even echoed Hogben’s assumption that many economists would reject the attempt to meld the two fields (though the Clows inserted their own blend of

⁴⁸ Hogben, *Science for the Citizen*, 808.

⁴⁹ Clow and Clow, *The Chemical Revolution*, xi.

⁵⁰ Clow and Clow, *The Chemical Revolution*, xii.

⁵¹ Clow and Clow, *The Chemical Revolution*, 43.

chemical wit): the book, they note, “is addressed to practitioners in both fields, in the full consciousness that the new compound, while having specific beneficial properties to some, may conceivably prove toxic to others.”⁵²

In keeping with the second goal of social technology (as defined above), the Clows set out to identify the social and technical factors that influenced the evolution of eighteenth century chemical technology in Scotland, and to examine the effect of that technology on society. “It is with the influence of chemistry on social conditions during this phase that we are in the main concerned”, they write in the introduction.⁵³ Despite these declarations, however, the Clows spend much more time examining the effect of eighteenth century society on the evolution of chemical technology, than they do actually examining the effect of chemical technology on social conditions. Many of the chapters examine the development of a beneficial amenity or product – such as glass bottles and windows (Chapter 14), soap (Chapter 5), paper (Chapter 13), and textiles (Chapters 8-11) – but stop short of actually examining its subsequent impact on society. The impact is taken as understood. This makes sense, however, if the goal of *The Chemical Revolution* was to contribute to Hogben’s heads of enquiries. By mapping the complex social and technical factors that contributed to the evolution of a beneficial social amenity, social technologists like the Clows would hope to be able to understand how to develop similarly beneficial amenities in the future. That being the case, what matters is not so much the actual effect that something like soap had on eighteenth century society, but the factors that contributed to its development. Indeed, the very success of soap would be the reason for its inclusion in the investigation. This would seem to be the meaning behind the Clows’ statement: “Community need and social utility determine the inclusion of a topic in what follows.”⁵⁴

At its core, then, *The Chemical Revolution* was not about examining in-depth the effect of cheaper and greater quantities of soap on general hygiene and the spread of disease in eighteenth century Scottish maternity wards. Rather, it was about tracing what Hogben often referred to as “the social background of scientific discovery”.⁵⁵ The Clows therefore summarize the forces acting on the development of innovations:

⁵² Clow and Clow, *The Chemical Revolution*, xi.

⁵³ Clow and Clow, *The Chemical Revolution*, xiv.

⁵⁴ Clow and Clow, *The Chemical Revolution*, 43.

⁵⁵ The full title of Hogben’s book is ‘Science for the Citizen: A Self-Educator based on the Social Background of Scientific Discovery’.

To see clearly why and how an innovation took place, when and where it did take place, implies something more than a knowledge of the social need that prompted the solution of a particular technical problem. It also calls for a knowledge of the class of raw materials suitable for the solution of the problem and the circumstances that made them available.⁵⁶

The chemical industry, they argue, “is the most polygamous of all industries”,⁵⁷ and therefore demands to be included in any attempt to map the ‘social background’ of a technological or industrial development.

This mapping of the economic, social, intellectual, technological, and material factors involved in the evolution of a technological innovation is the main function of the social technologist, and it is in this context that Hogben actually employs the term ‘social technology’. “When there is a science of *social technology*”, he writes in ‘Prolegomena to Political Arithmetic’, “it will give us a balance sheet of human effort, materials, and natural resources expressed in the established equivalence between the various physical units of heat, kinetic energy, and potential energy.”⁵⁸ Such a balance sheet would undoubtedly require a great deal of background work – at one point Hogben referred to the degree of the task as “an inventory of the universe”⁵⁹ – but Hogben was confident that once these methods were properly developed, social technologists would be able to “apply an objective criterion to the efficiency of the social machine as we can to the steam engine.”⁶⁰ *The Chemical Revolution* was an attempt to contribute to this inventory of the universe by mapping the labor, materials, and natural resources involved in various industries, and, furthermore, was an attempt to contribute to the dream of increasing the efficiency of the social machine.

One of the main ways the Clows approached this task was by mapping what they referred to as the “interconnexions”⁶¹ and “cross-connexions”⁶² between all the factors in industrial economies. The diagram from *The Chemical Revolution* below wonderfully illustrates

⁵⁶ Clow and Clow, *The Chemical Revolution*, xi.

⁵⁷ Clow and Clow, *The Chemical Revolution*, 130.

⁵⁸ Hogben, “Prolegomena to Political Arithmetic,” 45.

⁵⁹ Hogben, *Science for the Citizen*, 621.

⁶⁰ Hogben, *Science for the Citizen*, 621.

⁶¹ Clow and Clow, *The Chemical Revolution*, 536.

⁶² Clow and Clow, *The Chemical Revolution*, 287.

these efforts with regards to the material, industrial, and technical interconnections of the sulphuric acid industry.⁶³

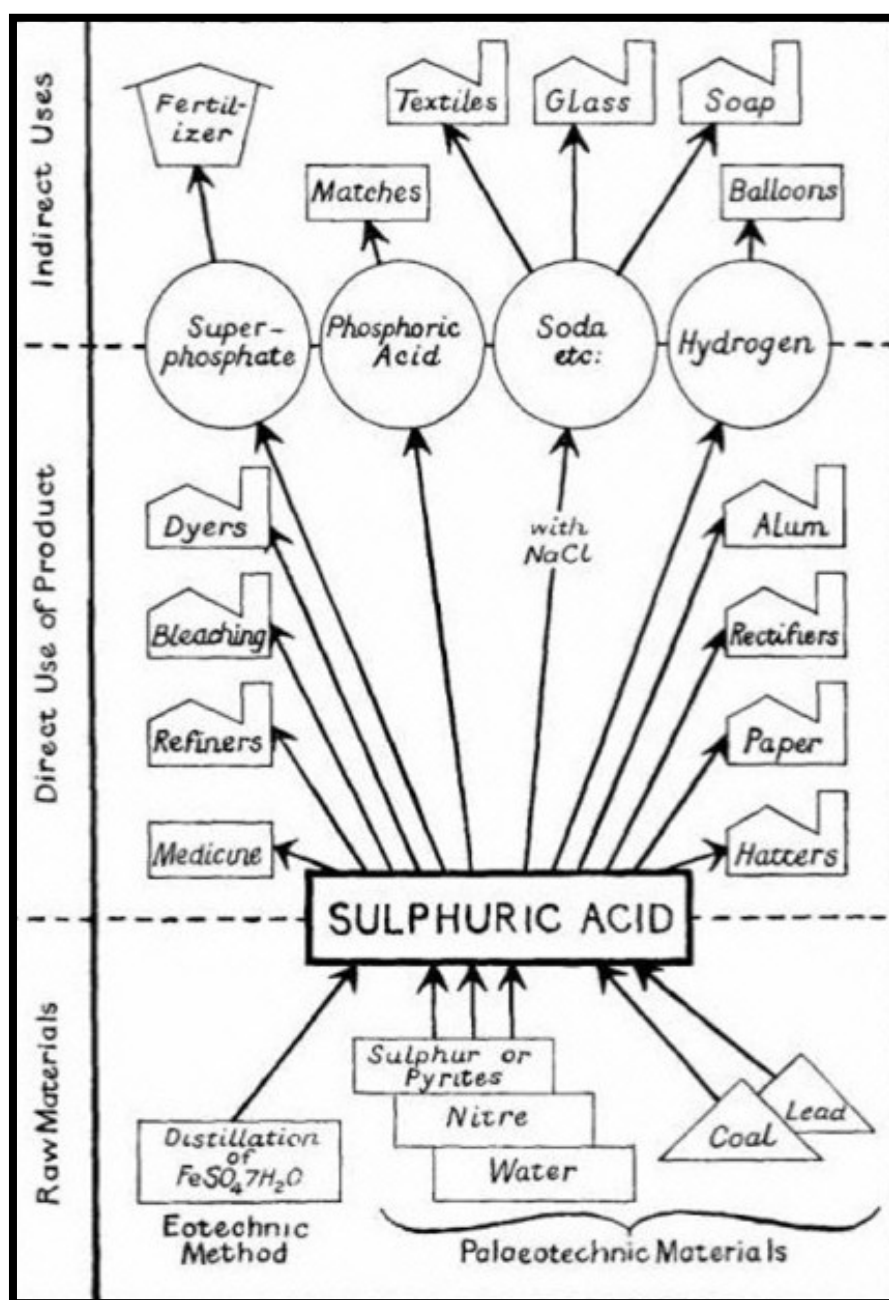


Figure 7: A page from *The Chemical Revolution* tracing the ‘interconnexions’ of the sulphuric acid industry.⁶⁴

As can be seen, the Clows trace the raw materials involved in the production of sulphuric acid, its uses (both direct and indirect) across various other industries, and the amenities reliant

⁶³ For the sake of consistency, I have here adopted the Clows’ spelling of ‘sulphuric acid’.

⁶⁴ Clow and Clow, *The Chemical Revolution*, 134.

upon it. On top of this diagram, however, must be superimposed all of the additional social factors traced by the Clows that influenced the development of the sulphuric acid industry. The fact that each of the 23 main chapters in *The Chemical Revolution* contains a comparable diagram of an important material or industry demonstrates the monumental nature of the Clows' task and highlights the interdependence and interconnectedness of the social background of important social amenities.

The Chemical Revolution, then, was 'a contribution to social technology' in that it was the Clows' attempt to aid in the development and maturation of the field of social technology. Like good, empirically-minded social technologists, the Clows were attempting to analyze the development of past beneficial technologies and amenities in order to better understand how to develop similarly beneficial technologies and amenities in the future. In short, they were working to identify ways of increasing the efficiency of the social machine. As such, the Clows were part of what Hogben described in *Science for the Citizen* as the new group of men and women who were bringing "the live curiosity and painstaking industry of the naturalist to bear on problems of contemporary society".⁶⁵

Thus, the Clows not only believed science and society were on the verge of a new age, but that soon it would be possible to develop a science of society based on social technology which would be capable of consciously directing the development of beneficial technologies. As will be seen in Chapter 3, Archie Clow would infuse many of his early BBC programmes with this understanding of scientific, technological, and societal advancement.

2.4. *Bringing about the new age*

What remains to be seen is why the Clows devoted themselves to the communication of science in general and to broadcasting in particular. As award-winning authors and ground-floor social technologists the Clows might have easily continued with their research and become a well-known husband and wife duo in the field of history of science. The reason for their switch to communication once again appears to revolve around Lancelot Hogben.

Hogben was convinced that although science was constantly making available new methods for human satisfaction, these new methods were often stifled or ignored by social institutions that either did not know how to take advantage of the new powers at their disposal,

⁶⁵ Hogben, *Science for the Citizen*, 1090.

or were invested in inefficient systems of organization that benefitted only the few. This in turn meant that even if social technologists like the Clows were to succeed in perfecting their craft, it would not, according to Hogben, be enough to see society progress to the next age. Science could not carry civilization to the next age on its own. Hogben therefore began the epilogue to *Science for the Citizen* by challenging his readers to contemplate “whether the present tempo of scientific progress will continue, or whether we are living in the twilight of a culture to be followed by dreary centuries of commentaries and imitators.”⁶⁶ “The further progress of science”, he concluded in response to his own question, “depends on how far the scientific worker and his fellow citizens co-operate with one another in applying scientific knowledge to the satisfaction of the common needs of mankind.”⁶⁷

Mumford, for his part, expressed similar sentiments, and asserted that without the requisite social changes to take advantage of the new instruments of neotechnic civilization, all the technical advances of the past decades promised “no more for society’s improvement than an electric bulb would promise to a monkey in the midst of a jungle.”⁶⁸ For both Hogben and Mumford, these outdated social institutions were dangerous impediments to social progress because they kept society from enjoying the benefits that science could offer.

The challenge that many writers set themselves during the 1930s was to identify the societal changes that would need to take place in order for these social institutions to not only encourage scientific research, but to take advantage of the new physical capabilities sure to be made available by that research. The answer upon which many landed was that society would need to remodel itself along scientific lines. The values, principles, and methods of science, so the argument went, offered sounder guidelines for how to effectively and efficiently structure society than any philosophy, ideology, or belief-system that had come before.⁶⁹

According to Hogben, many in society had so far failed to heed this point. In *Science for the Citizen*, Hogben was particularly scathing in his assessment of the political class, referring to English politicians as “probably the most expensively uneducated class of people alive at the present day.”⁷⁰ Later, after noting that Scandinavian pig-breeders had installed special Vitamin D-transmitting glass in their pig-sties in order to stave off rickets in their livestock, Hogben

⁶⁶ Hogben, *Science for the Citizen*, 1077.

⁶⁷ Hogben, *Science for the Citizen*, 1077.

⁶⁸ Mumford, *Technics*, 215.

⁶⁹ For more on this argument, and on the role of J.D. Bernal in advancing it, see Chapter 6.2 in Gary Werskey, *The Visible College* (London: Allen Lane, 1978).

⁷⁰ Hogben, *Science for the Citizen*, 1082.

lamented that English politicians had failed to learn a similar lesson about the potential benefits of science. “There has been more progress in the education of Danish pig-breeders than in the education of British politicians”, he complained.⁷¹

Thus, for Hogben, the next age would necessitate “a new orientation of educational values and new qualifications for civic responsibility.”⁷² The way to ensure that citizens possessed these was through a campaign to communicate science to the British public. By turning to the communication of information about science the Clows saw themselves as contributing to this effort.

Hogben had very particular views about what type of information a would-be communicator of science should attempt to communicate to the British public and how that would-be communicator should go about doing so. Here again the Clows followed Hogben’s lead. First, Hogben was adamant that the goal of a communicator of science was to enlist public support for science, and that the best way of doing that was by showing citizens the benefits that flowed from science. “Whether the individual investigator succeeds in getting opportunities to do the things which are worth while to *him*”, he wrote in *Science for the Citizen*, “depends on whether he can get society or other individuals to believe that what he intends to do is worth while to *them*.”⁷³ Crucially, this meant that the task of a would-be communicator of science was not to produce more scientists by educating the public about the difference between mitosis and meiosis, but to educate them about the history of science and its beneficial impact on society. He expressed this most directly in a talk delivered at a conference organized by the Workers Educational Conference in 1939. “The adult education movement has no need for biology courses of the kind which exist in the universities”, Hogben argued: “What it needs are courses on malnutrition, public health policy, and the revolution of agricultural techniques made possible by present biological discoveries”.⁷⁴ This was the meaning behind Hogben’s statement in the introduction to his 1,100-page tome that “science for the citizen” should be “science as a record of past, and as an inventory for future, human achievements.”⁷⁵ Besides, Hogben noted, science – especially the science found in traditional textbooks – could be rather boring. “We do not need

⁷¹ Hogben, *Science for the Citizen*, 916.

⁷² Hogben, *Science for the Citizen*, 1089. For more on Hogben, see Werskey, *The Visible College*, 172–73.

⁷³ Hogben, *Science for the Citizen*, 736. Original emphasis.

⁷⁴ Lancelot Thomas Hogben, *Dangerous Thoughts* (London: G. Allen & Unwin, 1939), 155–56. Cited in Werskey, *The Visible College*, 173.

⁷⁵ Hogben, *Science for the Citizen*, 9.

biologists to tell us that any subject can be made dull enough to defy the efforts of any but a few exceptionally bright or odd individuals”, he wrote in *Science for the Citizen*.⁷⁶

Hogben’s approach, then, involved leveraging the past benefits of science to demonstrate the possibilities of the future – a future that could only come about if society learned to respect and embrace science. This can be seen in a quote from the first chapter of *Science for the Citizen*, in which Hogben laid out the purpose of the book. The book, he explained, had been written to tell the story of the growth of science:

... as a record of human achievement, a story of the satisfaction of the common needs of mankind, disclosing as it unfolds new horizons of human wellbeing which lie before us, if we plan our new resources intelligently.⁷⁷

Thus, while there was undoubtedly a need for communicators who could educate the public about the fundamentals or principles of science, any would-be communicator of science who sought to enlist public support for science should attempt to do so by first educating the public about the material benefits that science had bestowed upon society over the past two centuries, then convincing them that if they hoped to continue receiving these benefits it was in their best interest to support scientists and their research.

Furthermore, Hogben was adamant that one should *not* attempt to convince the public to support science by appealing to the beauty and fulfilling nature of pure science or scientific research. In fact, Hogben believed that idealist appeals to the beauty of pure science were, in essence, attempts to reinforce the current social and political order, and as such, only served to prevent mankind from progressing to the next stage of scientific and societal advance. “Science thrives by its applications”, noted Hogben: “To justify it as an end in itself is a policy of defeat.”⁷⁸ In the coming age, he argued, attempting to justify science on the grounds of its beauty or fulfilling nature would be like discussing “whether chewing gum is worthwhile for its own sake.”⁷⁹ In his book, *Films of Fact*, Timothy Boon explains that Hogben’s goal was thus to “sweep

⁷⁶ Hogben, *Science for the Citizen*, 1075. Despite this, *Science for the Citizen* is essentially a textbook, with 339 sample questions sprinkled throughout the book and 49 equations/concepts listed as “Things to Memorize”.

⁷⁷ Hogben, *Science for the Citizen*, 17.

⁷⁸ Hogben, *Science for the Citizen*, 736.

⁷⁹ Hogben, *Science for the Citizen*, 737.

away the mystification normally caused by popular science, and replace it with a functionalist view”.⁸⁰ What mattered were results.

Finally, Hogben was optimistic about the prospects for convincing the public to support and respect science, for in his mind modern science had recently furnished would-be communicators of science with the perfect means of getting this message out to the public: radio and film. For Hogben, these new forms of communication suggested an answer to his question “will the accumulated scientific knowledge of the last century be made available for the satisfaction of common human needs?”⁸¹ “We may hazard this”, he wrote in *Science for the Citizen*:

... only if those who have the will to see it so used organize the use of the new instruments of electrical communications. In the age of the pamphleteers it was said that the pen is mightier than the sword. This is not the age of pamphleteers. It is the age of the engineers. The spark gap is mightier than the pen.⁸²

Hogben’s ideal communicator of science, then, was someone who would harness the powers of modern mass communication in order to educate the public about the past, present, and potential future benefits of science and, ultimately, enlist their support for science. The Clows cast themselves in this role and, like Hogben, were particularly exercised by the desire to ensure that society respected science enough to support it and take advantage of its benefits.

2.5. *The Aberdeen Scientific Film Club*

The Clows’ activities in Aberdeen bear out their commitment to educating the public via these ‘new instruments of electrical communication’. One year after Hogben published his clarion call in *Science for the Citizen*, the Clows helped to found the Aberdeen Scientific Film Club – one of the first clubs of its kind in Britain. Nan served as secretary for the club from its first meeting in October 1939,⁸³ and Archie regularly chaired discussions of films about advances in chemical industry.⁸⁴ As the *Aberdeen Press and Journal* put it the day after the inaugural meeting: “The purpose of the club is to illustrate, by means of the screen and commentary, how science is

⁸⁰ Boon, *Films of Fact*, 82.

⁸¹ Hogben, *Science for the Citizen*, 1089.

⁸² Hogben, *Science for the Citizen*, 1089.

⁸³ In fact, a 1942 article published in *Documentary News Letter* lists Nan as the founder of the club. Four-Way, “Scientific Films in Britain,” *Documentary News Letter* 3, no. 8 (August 1942): 115.

⁸⁴ In December 1940, for instance, Clow delivered a commentary on the film ‘Chemical Work in the Centrifuge Cone’. “Scientists See Films and Smell Fish,” *Aberdeen Press and Journal*, December 13, 1940, 3.

in the service of man, what scientists do, and how they do it.”⁸⁵ The *Press and Journal* also explained that the films had been written and produced in such a way that they would be “as easily understood by the general public as by those engaged in or studying science.”⁸⁶ Throughout his time at the BBC, Clow strove to ensure that the same could always be said of his programmes.

Over the years, the club arranged public screenings of films that showcased the ways in which science was benefitting society, such as: *Health and War*,⁸⁷ *Historical Introduction to Chemistry*,⁸⁸ and a film dealing with “the manufacture of drugs from coal”.⁸⁹ The club even arranged for the nutritionist Sir John Boyd Orr to introduce and comment on two films in which he appeared: Edgar Anstey’s *Enough to Eat?*, and Paul Rotha’s *World of Plenty*.⁹⁰

The club was convened under the auspices of the Association of Scientific Workers (AScW) which had established the London Scientific Film Society the previous year.⁹¹ The London branch had as its patrons a number of titans of British science, including Julian Huxley, A.V. Hill, William Bragg, and, perhaps not surprisingly, Lancelot Hogben. The same year that the Clows established their branch in Aberdeen, the Films Committee of the AScW explained why the association was putting its time and effort into establishing such societies:

Science is the foundation of progress. In the long run the benefits of science can only accrue to a society which is capable of understanding and accepting them in their full implications. The basis of an understanding of science lies in the reform of education, but it is almost as important to see that adult minds have the opportunity of appreciating what science is doing and how it is likely to affect human life. We hope that the greatest possibilities offered by the cinema in this way will be developed and used to their greatest extent.⁹²

⁸⁵ “Scientific Film Club in Aberdeen,” *Aberdeen Press and Journal*, October 27, 1939, 3.

⁸⁶ “Scientific Film Club in Aberdeen,” 3.

⁸⁷ “Scientific Film Club of 180,” *Aberdeen Press and Journal*, October 23, 1942, 4.

⁸⁸ “Banned Film on View,” *Aberdeen Press and Journal*, December 18, 1942, 4.

⁸⁹ “Banned Film on View,” 4.

⁹⁰ “Social Wellbeing Means Long Life,” *Aberdeen Press and Journal*, March 10, 1944, 4. For a discussion of both films see Boon, *Films of Fact*.

⁹¹ Boon, *Films of Fact*, 116. Boon notes that the society had its first meeting in November of 1938. The AScW was, of course, the same organization that would convene the ‘Science and Radio’ conference in 1946. For more on the London Scientific Film Society, see Boon, *Films of Fact*, 115–17.

⁹² “The Educational and Cultural Film,” *The Scientific Worker*, 1939, 43. Cited in Boon, *Films of Fact*, 116.

So committed was Archie to ensuring that these films were made available to the public, that in 1939 he wrote to the editor of the *Aberdeen Press and Journal* to chide the powers that be for refusing to allow the Scientific Film Club to screen a film on the aid science could give to midwifery (*The Birth of a Baby*).⁹³ (The issue was likely a personally important one for Archie, for it would appear his parents lost a daughter during childbirth when he was eight years old.⁹⁴) Why had the film been banned? “Because”, Clow lamented in his letter to the editor, “a lot of old women, of both sexes, contrive to deny to Scottish motherhood the aid and protection which medical science can, and ought to give it.”⁹⁵ Clow made an impassioned plea for the film to be shown, even if only at private screenings. “Only then”, he argued, “will the youth of Scotland realise the jeopardy in which it is being placed by anti-scientific legislation.”⁹⁶ Clow therefore scolded the Scottish magistrates who had banned the film for failing to take advantage of the help that science could give to mankind. “A society which lavishes the maximum of veterinary skill upon a brood-mare”, he asserted, “but denies its womankind equal medical attention deserves to go to the wall – as it certainly shall.”⁹⁷ In the new age – i.e., once the ‘new orientation of educational values’ that Hogben had called for in *Science for the Citizen* had been achieved – the idea that the benefits of science would be withheld from half the human population would be unconscionable. Clow feared, however, that if society continued to be run by so many ‘old women of both sexes’, society would never make this transition. To emphasize his point, Clow closed by posing a question strikingly similar to the question Hogben had posed to readers of *Science for the Citizen*. “This film does not raise the question of having a baby in public”, he wrote: “it raises the principle, ‘is science to be suppressed and its benefits withheld from mankind?’”⁹⁸ A few months after the article ran in the *Aberdeen Press and Journal*, Clow won a small victory when the magistrates relented and allowed the Aberdeen Scientific Film Club to hold a private screening of the film.⁹⁹

By the summer of 1942 the scientific film movement had grown large enough¹⁰⁰ that the various scientific film societies in Scotland and England were in a position to organize the National Scientific Film Conference – for which Archie was chosen as representative of the

⁹³ “Scots Maternal Mortality,” *Aberdeen Press and Journal*, August 20, 1940, 2.

⁹⁴ “Births,” *Aberdeen Evening Express*, November 15, 1917, 3.

⁹⁵ “Scots Maternal Mortality,” 2.

⁹⁶ “Scots Maternal Mortality,” 2.

⁹⁷ “Scots Maternal Mortality,” 2.

⁹⁸ “Scots Maternal Mortality,” 2.

⁹⁹ “Private Show of Banned Film,” *Aberdeen Press and Journal*, April 8, 1941, 2.

¹⁰⁰ At the start of the 1942 season, the Aberdeen club could boast of a membership of 180. “Scientific Film Club of 180,” 4.

Aberdeen branch and invited to deliver a paper.¹⁰¹ The content of Clow's talk is apparently lost to history, but there was general approval of a resolution, part of which read:

If we are to avoid disastrous mistakes in social planning, both during and after the war, it is vitally necessary that there should be a widespread understanding of the scientific method. The creative potentialities of science need to be brought vividly into the consciousness of every citizen. ... Enormous potential audiences are ready, in the factories, in Civil Defence, and in the Armed Forces. ... The general purpose of this Conference is to see that the films are brought to the audiences.¹⁰²

Considering this explicit call to bring 'the creative potentialities of science' to those serving in the armed forces, it is perhaps not surprising that three years after this resolution was approved Clow took up a position in the Services Educational Unit of the BBC producing science programmes for services personnel. From his work with the Scientific Film Club, it is clear that Clow was committed to educating the public about the potential benefits of science in order to ensure that these benefits were not withheld from society, and, furthermore, that he was committed to utilizing the new methods of electrical communication to do so.

2.6. *The sooner the better*

Though Clow's talk at the National Scientific Film Conference in 1942 appears not to have survived, he provided an explicit delineation of his functionalist approach to science broadcasting at a conference in Cambridge in May 1946 – by which point Clow was head science producer in the SEU.¹⁰³ Entitled, 'Science and Radio', the two-day conference was arranged by the Cambridge branch of the Association of Scientific Workers (AScW), and BBC staff involved in the production of scientific programmes were invited to speak about their craft.¹⁰⁴ What the post-war listener needed was not more programmes about the fundamentals of science – e.g.

¹⁰¹ "Scientific Film Conference," *Nature* 150, no. 3799 (August 22, 1942): 230. The first two sessions were held in Ayr, Scotland on the 1st and 2nd of August, 1942. The third session was held in London on 16 August 1942.

¹⁰² The resolution was proposed in Ayrshire and seconded at the London conference on 16 August. The *Nature* article notes that there was general approval of this resolution, but does not include the resolution in full. The quote itself comes from Four-Way, "Scientific Films in Britain," 115.

¹⁰³ Archibald Clow, "Science in Services Educational Programmes" (Science and Radio, Cambridge, 1946). The report of the conference – from which Clow's comments have been taken – appears to have been compiled from notes submitted by each speaker. As such, they may not represent direct quotes.

¹⁰⁴ On the first day of the conference, attendees had heard from Mary Adams, an influential producer of science programmes for BBC television, and from Ian Cox, the primary developer of science talks for BBC radio. For more on Mary Adams, see Jones, "Mary Adams and the Producer's Role in Early BBC Science Broadcasts."

programmes about the chemistry of photosynthesis or the life cycle of a butterfly – Clow argued, but historical “life stories of scientists” and programmes about “the origins of this and that”.¹⁰⁵ The positive response such programmes had received from listeners over the previous months convinced Clow that there was “a great potential market” in post-war Britain for what he referred to as “background information about science” – “a demand”, he noted, “that can be met through the medium of radio without insuperable difficulties.”¹⁰⁶

Like Hogben, Clow’s approach to science communication eschewed programmes on the fundamentals of science in favor of programmes that sought to demonstrate the ways science had benefitted mankind over the past two centuries. Where Hogben fashioned *Science for the Citizen* into a ‘record of human achievement’ and a ‘story of the satisfaction of the common needs of mankind’, Clow called for historical programmes about the discoveries of famous scientists and programmes that detailed the origins of beneficial technologies. This is what Clow meant by ‘background information about science’. “With regard to the aim of the scientific programmes”, he explained:

... it has been made clear that the primary aim of science broadcasting at *our present level of scientific culture* is not to attempt to make scientists but instead an attempt has been made to establish a greater understanding *about* science and an improved knowledge about the activities of scientists and the work they do.¹⁰⁷

This was straight out of *Science For the Citizen*. Yet Clow sought to defend this approach against any purists who might criticize it for failing to convey the pleasure that one can receive from scientific research. In doing so, Clow not only showed that his approach to science communication involved leveraging the past benefits of science to demonstrate the potentialities of a more scientific future – as Hogben had advocated – but he also gave a glimpse into the ultimate purpose of such an approach. “A criticism may be raised that this is a materialistic approach and one which overlooks the elegance of scientific method”, Clow admitted, “but it has been felt that the sooner mankind realises what science has done in the past 200 years and what it may do in the next two hundred, the better.”¹⁰⁸

¹⁰⁵ Clow, “Science in Services Educational Programmes.”

¹⁰⁶ Clow, “Science in Services Educational Programmes.”

¹⁰⁷ Clow, “Science in Services Educational Programmes.” Emphasis added.

¹⁰⁸ Clow, “Science in Services Educational Programmes.”

When the BBC hired Archie Clow in the summer of 1945, they hired a man who was not only committed to providing members of the public with ‘background information about science’ and educating them about the material benefits of science, but who saw himself as enlisting public support for science in order to help both science and civilization progress to the next age – an age of plenty. The following chapters will trace how this commitment fed into his programme-making during his first years at the BBC.

Part I:

A Post-War Platform for Science

... the BBC has an obligation to present the scientist himself: to bring the authority to the microphone and present him to the public. [...] In such a co-operative effort the facts are the responsibility of the scientist: the treatment is open to discussion.

*Archibald Clow*¹

¹ “The Presentation of Science to the Public,” *Journal of the Royal Institute of Chemistry* 80 (1956): 437–38.

Chapter 3:

A Functionalist Approach to Science Broadcasting

Before Archie and Nan departed Aberdeen for London, *The Press and Journal* of Aberdeen ran a 7 July 1945 article congratulating the couple for winning the Senior Hume Brown Prize in Scottish History for their work in *The Chemical Revolution* – “an unusual distinction for two scientists”,² the paper noted. The article went on to wish Archie success in his new position, explaining: “He is now going to the British Broadcasting Corporation to take charge of the science section of a new broadcast service that will go on the air in the autumn.”³ That ‘new broadcast service’ launched two months later on 3 September 1945 as Forces Educational Broadcasts, and was transmitted to forces personnel stationed in Britain, Europe and further afield, from the Middle East to South-East Asia.⁴

The programmes were aimed at forces personnel whose units would soon be demobilized and were arranged in short six-week cycles, the first of which included: *English* I, II, and III; *Home Interests*; *Music Review*; *Clear Thinking*; *French*; *Social History*; *General Citizenship*; *Geography of the Air*; *Science* I and II; and a series on employment opportunities in various industries known alternately as *Industrial Magazine* or *Job in Hand*.⁵ With 18 timeslots made available for FEBs within the Light Programme schedule each week, the two science series made up one ninth of the SEU’s total output.⁶ Clow imbued many of the programmes he developed for these series with his view of the nature of scientific and societal advance. In addition, Clow’s time in the SEU taught him that in certain cases the practicing scientist was not the best person to communicate important information about science. Given the length and importance of Clow’s career at the BBC, it is worth examining his time in the SEU in detail in order to

² “Two Scientists Win Edinburgh Prize,” 4.

³ “Two Scientists Win Edinburgh Prize,” 4.

⁴ Briggs, *Sound and Vision*, 4:737. For a discussion of Forces Educational Broadcasts more generally, see Chapter 6.6 of Briggs, *Sound and Vision*.

⁵ Briggs, *Sound and Vision*, 4:738.

⁶ Clow, “Science in Services Educational Programmes,” 1.

understand the approach to science programming that he would bring with him when he moved to take over science programming on BBC radio as a whole.



Figure 8: Article congratulating the Clows for winning the Senior Hume Brown Prize for Scottish History.⁷

3.1. The Services Educational Unit

Upon his arrival at the BBC, Clow would have found many like-minded colleagues. Firstly, many in the SEU were similarly committed to using radio to educate listeners. Unlike other parts of the BBC that eschewed directly educational programmes, the SEU's remit was explicitly educational. Indeed, the *Radio Times* article announcing the launch of Forces Educational Broadcasts noted that the new scheme would be “an interesting experiment in the

⁷ “Two Scientists Win Edinburgh Prize,” 4.

use of radio for educational purposes.”⁸ The article clarified, however, that these educational broadcasts would move beyond traditional schoolroom terrain to provide listeners with “a fuller understanding of the world they live in.”⁹ According to a similar article in the BBC’s weekly magazine, *The Listener*, “educational” was perhaps “too narrow a word” for the wide range of proposed courses had “the very broad aim of fitting the men and women of our fighting services for the transition to civilian life.”¹⁰

The *Radio Times* article was careful to point out that although the broadcasts were to be “addressed to a specialized audience”, it was nonetheless “expected that many civilian listeners will wish to eavesdrop”.¹¹ Indeed, by the time Clow spoke to the ‘Science and Radio’ conference in May 1946 – eight months after the start of the service – he could confirm that the number of domestic ‘eavesdroppers’ to Forces Educational Broadcasts was “on occasion well over the million mark.”¹² In light of these figures, Clow was confident that the work of the SEU was “undoubtedly one of the most important experiments ever made in sustained adult education”.¹³

His use of the word, ‘experimental’, was quite intentional, for as he went on to explain in his ‘Science and Radio’ talk:

It may be safely said that the attitude of the Unit as a whole has been to keep these programmes experimental and as far as science is concerned, widely varied programmes have been organised and their effect studied.¹⁴

This focus on experimentation meant that although the programmes were educational, they were hardly stilted or pedantic. Briggs, for instance, writes of the work of the SEU: “‘Facile popularization’ was deliberately avoided, but the ‘blackest crime in broadcasting’, it was held, was ‘to be dull’.”¹⁵ Over the first year of the service, Clow’s programmes ranged from straight talks, discussions, and interviews to dramatized biographies, question and answer programmes and features – a type of radio documentary that melded dramatic interpretations, scripted dialogue, ‘word pictures’, voice-overs, and sound effects to produce a creative form unique to radio. He also produced a short series of broadcasts entitled ‘Science Correspondent Reports’ in which

⁸ “Education by Radio,” *Radio Times* 88, no. 1144 (August 31, 1945): 5.

⁹ “Education by Radio,” 5.

¹⁰ *The Listener*, no. 845 (March 22, 1945). Cited in Briggs, *Sound and Vision*, 4:737.

¹¹ “Education by Radio,” 5.

¹² Clow, “Science in Services Educational Programmes,” 1.

¹³ Clow, “Science in Services Educational Programmes,” 1.

¹⁴ Clow, “Science in Services Educational Programmes,” 2.

¹⁵ Briggs, *Sound and Vision*, 4:738.

Richard Barr, a former BBC war correspondent, toured famous industrial research laboratories and interviewed employees about the work being conducted there.¹⁶

In addition to finding SEU colleagues who were committed to using radio to educate, Clow would have found a few who were committed to using radio to educate listeners about *science* in particular. As Allan Jones has shown, certain producers at the BBC had been stressing the need to educate the public about science even before Clow's arrival. Jones explains that these producers were convinced that "part of the function of science broadcasting was to 'correct' some deficiencies in the listeners' outlook."¹⁷ For instance, in 1942 – three years prior to Clow's arrival – Richard Palmer, Senior Assistant (School Broadcasting) submitted a report entitled 'Broadcast Science' in which he outlined six potential roles for science broadcasting.¹⁸ Jones notes that while the first of these aimed at "satisfying an existing interest in the listener", the rest were about "influencing the public's beliefs and attitudes."¹⁹ "In this respect", writes Jones, "Palmer showed himself to be like many of the scientists who [...] believed that the BBC should try to shift public perception of science in a direction favourable to science."²⁰

Mary Somerville, then Director of School Broadcasting, agreed with Palmer. Writing in response to Palmer's report in 1942, Somerville argued that broadcasting had a special role in educating 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 in all departments of life when co-operation depends on the acceptance of scientific principles."²¹ She admitted that this role of science broadcasting had been neglected – "I don't think we have yet put our backs into the job"²² – and therefore proposed a series of programmes "on the 'wonders of science'".²³ "It might have little direct effect", she explained:

... 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

¹⁶ "Science Correspondent Reports," *The Radio Times*, no. 1167 (February 8, 1946): 13. The short-lived series broadcast four programmes between January and March 1946.

¹⁷ Jones, "Speaking of Science," 148.

¹⁸ Richard Palmer, "Broadcast Science," March 2, 1942, R51/523/3, Written Archives Centre. Cited in Jones, "Speaking of Science," 143–44.

¹⁹ Jones, "Speaking of Science," 145.

²⁰ Jones, "Speaking of Science," 145.

²¹ Mary Somerville to Director of Talks, "Possible B.B.C. Science Policy," Memorandum, (March 3, 1942), R51/523/3, Written Archives Centre. Also discussed in Jones, "Speaking of Science," 145–49.

²² Somerville to Director of Talks, "Possible B.B.C. Science Policy."

²³ Somerville to Director of Talks, "Possible B.B.C. Science Policy."

cooperate in a hundred and one other spheres of modern life, because they continue as individuals to live in the dark ages.²⁴

Jones argues that Palmer's and Somerville's comments show that there were occasionally producers at the BBC who "were not shy about the notion that [...] listeners ought to be more versed in science for their own good, and that science broadcasting could correct errors of thought."²⁵ Archie Clow was certainly one of these producers – though Clow might have added that listeners ought to be more versed in science for the good of industry, the country, and even science itself.²⁶

Finally, Clow would have found a few colleagues at the BBC who were similarly committed to mounting programmes on applied science rather than the fundamentals of science. When N.G. Luker, Manager of the SEU, began drafting the outline for science broadcasts for the forces in March 1945 – four months before Clow joined the unit – his plan was to divide the forty minutes allotted for science programmes into two separate strands: one for 'applied' science, the other for 'pure' or fundamental science. As he explained in a memo on 2 March 1945, the applied science strand would be titled 'Battles without Bullets'.²⁷ In language that recalls Clow's own approach to science communication – albeit without the latter's functionalist perspective or commitment to social technology – Luker noted that the series would consist of programmes describing "some of the scientists' struggles to 'direct the forces of nature for the benefit and convenience of mankind' – the war against locusts, malaria, flood, erosion, fog, storm, cancer, yellow fever, plant pests, vermin, accidents."²⁸ "The aim of this series", he later clarified, was "to give, in a setting with some dramatic interest, a description of the scientific approach to a wide variety of problems."²⁹ Luker went into considerably less detail about the pure science strand, however, describing it simply as "Background talks on the main branches of science".³⁰

²⁴ Somerville to Director of Talks, "Possible B.B.C. Science Policy."

²⁵ Jones, "Speaking of Science," 148.

²⁶ Clow also might have objected to the term 'versed in science' if that meant that listeners ought to know more of the fundamentals and facts of science rather than the ways science was benefitting the modern world.

²⁷ N.G. Luker to Assistant Controller (Home Service), "Forces Educational Programme: Science I & II," March 2, 1945, R51/547, Written Archives Centre.

²⁸ Luker to Assistant Controller (Home Service), "Forces Educational Programme: Science I & II."

²⁹ Luker to Assistant Controller (Home Service), "Forces Educational Programme: Science I & II."

³⁰ Luker to Assistant Controller (Home Service), "Forces Educational Programme: Science I & II."

Five days later when Richard Palmer expressed concerns that forces personnel would rarely be able to hear both series, and would therefore be in danger of developing a one-sided view of science, Mary Somerville, responded:

There was no suggestion that any unit would look to broadcasting for a whole view of science, so I think we need not fear that to differentiate series as between pure and applied science would result, if only one series were followed, in our being responsible for anybody getting a one-sided view of science.³¹

Somerville went on to explain: “Nearly all the subjects suggested in the papers before the Committee are connected with applied science, and the scientific bias given in ‘Job in Hand’, History, and Geography will also be technological.”³² Luker, for his part, concurred: “I agree entirely that we are under no obligation to present a whole view of science”, he wrote to Somerville on 17 March 1945.³³ Thus, even before Clow left Aberdeen for London, there was within the SEU a growing commitment to programmes about applied science.

Upon Clow’s arrival at the SEU in July 1945, this commitment became even more deeply engrained. After the launch of the service that September, Clow broadcast just two³⁴ six-week series on pure or fundamental science for what was supposed to be the ‘pure science strand’ (‘Atoms’;³⁵ ‘Molecules Made to Measure’³⁶) before writing to management to argue for a change in approach: “I think this time that we need to break with atoms and molecules”.³⁷ Of the following series broadcast in the pure science strand before the restructuring of Forces Educational Broadcasts in January 1947, just two dealt with ‘scientific principles and possibly method’ in a manner similar to that conceived of by Luker (‘Try This’, a five-part series on physiology,³⁸ and ‘What’s in Your Mind?’, a six-part series on psychology³⁹). The other series dealt instead with topics that stressed the benefits of science and conveyed ‘background information about science’, such as: ‘Modern Scientific Instruments’, a series about “the tools

³¹ Mary Somerville to N.G. Luker, “Forces Educational Programme: Science I and II (Interview Note by SASB),” March 16, 1945, R51/547, Written Archives Centre.

³² Somerville to Luker, “Forces Educational Programme: Science I and II (Interview Note by SASB).”

³³ N.G. Luker to Mary Somerville, “Forces Educational Programme: Science I and II,” March 17, 1945, R51/547, Written Archives Centre.

³⁴ The first six-part series for Science II was actually a reworking of a previous 1942 series by the zoologist DMS Watson entitled ‘Man’s Place in Nature’.

³⁵ ‘Atoms’ ran from 19 October to 23 November 1945.

³⁶ ‘Molecules Made to Measure’ ran from 7 December 1945 to 11 January 1946.

³⁷ Archie Clow to Captain Morley, “Series 5: Science I and II,” January 10, 1946, R51/547, Written Archives Centre.

³⁸ ‘Try This’ ran from 15 March to 12 April 1946.

³⁹ ‘What’s in Your Mind?’ ran from 3 May to 7 June 1946.

the 20th century Scientist has given to the world”;⁴⁰ ‘Food for Thought’, a series about the help science gives to the food industry;⁴¹ ‘Operation’, a series of historical programmes about science and pharmacology;⁴² and finally, ‘This Had to Happen First’, a series that illustrated “the background to important scientific discoveries”.⁴³

To be sure, there was much cross over between the pure and applied strands – a programme on applied science was bound to touch upon at least some elements of pure science, and vice versa – but the fact that Clow purposefully overhauled the pure science strand to make it focus more on applied science meant that of the series broadcast in the two science strands from October 1945 to November 1946, just four dealt with pure or fundamental science. The rest dealt with topics that fit with Clow’s functionalist approach to science broadcasting.

Clow also quickly began emphasizing the importance of ‘background information about science’. Indeed, one of the very first programmes Clow contributed to after arriving at the BBC was an innovative FEB series entitled *Science and History*. Like many other science programmes on BBC radio at the time, each programme in the six-part series examined a particular scientific development or discovery from the last two hundred years. What made the series novel, however, was that each of these *Science and History* talks was paired with a corresponding *History and Science* talk that sought to examine the social context of those developments. For instance, the *Radio Times* advertised Arthur Elton’s 5 December 1945 broadcasts as:

‘Science and History’: Arthur Elton tells of man’s discovery of how to make gas from coal for lighting purposes. This afternoon at 3.0 p.m. he will talk about its effect on society.⁴⁴

In a few cases these *History and Science* programmes were delivered by scientists, but many were presented by non-scientists such as the fashion historian James Laver, or as features programmes. For instance, on 12 December the series consisted of a *Science and History* talk by

⁴⁰ “Past F.E.B. Science Series,” Undated, 2, R51/547, Written Archives Centre. ‘Modern Scientific Instruments’ ran from 25 January to 1 March 1946.

⁴¹ ‘Food For Thought’ ran from 21 June to 26 July 1946.

⁴² ‘Operation’ ran from 18 October to 1 November 1945.

⁴³ “The Story of Nylon,” *The Radio Times*, no. 1193 (August 9, 1946): 17. ‘This Had to Happen First’ ran from 9 August to 13 September 1946.

⁴⁴ “Science and History,” *The Radio Times*, no. 1157 (November 30, 1945): 17.

the historian of science F. Sherwood Taylor on “the use of chemical products in the fight against dirt”,⁴⁵ followed that afternoon by a *History and Science* feature advertised as:

‘The War against Dirt’: a feature written by Gwen Marsh from material supplied by F. Sherwood Taylor. Cleanliness may be an artificial habit, but as our civilisation became urban and industrial it became a necessary habit. This feature shows some of the ways in which we developed the habit in our cities.⁴⁶

Thus each programme on a scientific development was followed by a programme that sought to place that development in its socio-historical context.⁴⁷ These programmes epitomized Clow’s approach to science programming – an approach which this thesis will refer to as ‘historical-contextual’ for it attempted to situate science within its context both diachronically and synchronically. Importantly, rather than turning to scientists to present these socio-historical programmes, Clow often turned to experts from other fields or worked with BBC personnel to develop features programmes. As will be seen, scientists did not always approve of this approach; nor did important figures within the BBC.

3.2. ‘*Science & Everyday Life*’

During the week before Christmas 1946, the Light Programme aired the final programmes of ‘Science I’ and ‘Science II’. Starting in January 1947 the time allotted for FEBs within the Light Programme schedule was drastically reduced, leaving just 15 minutes for science broadcasts where once there had been 40. Considering Clow’s approach to science broadcasting and his affinity for programmes that conveyed background information about science, it is not surprising that he proposed to fill those remaining 15 minutes with a series on the benefits that science had bestowed upon society rather than on the fundamentals or principles of science.

The new series, *Science & Everyday Life*, broadcast 230 programmes from September 1947 to July 1952⁴⁸ – making it one of the longest-running science series broadcast on the Light Programme during the post-war period – and though it was principally directed at forces

⁴⁵ “Science and History,” *The Radio Times*, no. 1158 (December 7, 1945): 13.

⁴⁶ “History and Science,” *The Radio Times*, no. 1158 (December 7, 1945): 13.

⁴⁷ Though the two programmes were separated by over four hours, they were clearly envisioned as a pair. The four hour gap was due to the fact that Forces Educational Broadcasts received only three time-slots each weekday (usually 10:00, 10:40, and 15:00).

⁴⁸ Six of these programmes appear to have been rebroadcasts of a previous *Science & Everyday Life* series, putting the number of original programmes at 224.

personnel, it attracted, as Clow often noted, a quite significant number of domestic eavesdroppers.⁴⁹ The series is worth examining not only because of its longevity and significant audience, but because it offers a glimpse into the type of science programme the BBC thought suitable for the Light Programme audience during the early post-war period.

During Clow's first few months at the SEU, he worked closely with Nesta Pain, a highly creative and talented producer of science features. The two coordinated on the development and planning of programmes, and sought each other's input on scripts and dialogue. However, as Clow became more settled in his role he appears to have exerted more control over the planning of FEB science programmes. By the time *Science & Everyday Life* debuted on 3 September 1947, Clow was almost solely in charge. Clow would plan out the content and approach of each new six-part series, then find scientists whom he knew to be good broadcasters to deliver the talks. Though Clow was required to submit a course syllabus to go along with each new six-part series in order to alert management to the direction he intended to take over the next few weeks, these appear to have been largely a formality for there are few recorded instances where management actually rejected a proposal. Within each syllabus Clow spelled out the thinking behind the upcoming set of programmes, and in most cases included a detailed summary of the content and approach of each of the six programmes. Considering that no scripts or recordings of Clow's forces broadcasts survive at the WAC, these syllabi are in many cases the only record of Clow's work on *Science & Everyday Life*, and therefore prove invaluable in helping to elucidate the purpose and aims of the series.

Clow laid out the rationale behind the series in the first syllabus. "The extent to which science enters into our daily lives through the help it gives to industry is very easily overlooked", he wrote on 18 July 1947:

But it does not matter if we select our clothes and examine the processes by which they are made – dyed, bleached or laundered ... or our food which has to be produced, processed and possibly preserved ... or our homes which have to be built, kept warm and painted ... in each of these things the processes are intimately connected with science.⁵⁰

⁴⁹ Briggs writes that forces broadcasts regularly attracted half a million 'eavesdropping' listeners from outside the forces each day. Briggs, *Sound and Vision*, 4:740.

⁵⁰ Archie Clow to D.T., "Syllabus for 'Science in Daily Life,'" July 18, 1947, R51/530, Written Archives Centre.

The problem, as Clow saw it, was that the public seemed woefully ignorant of the role science had played in creating their favorite amenities. “Unfortunately most of us get a sort of ‘across the counter’ view of commodities”, he wrote:

... and we never get an opportunity to find out the uses of science in industry. The science is kept under the counter, as it were, and the more familiar the object, the less we know about how it is made.⁵¹

To address this, Clow signaled his intention to fashion *Science & Everyday Life* into a series that would “make listeners aware of the scientific background to industry”.⁵² In the syllabus for the third series Clow confirmed that this new series, like his previous programmes for the forces, would eschew traditional textbook-style talks:

... a large part of Science & Everyday Life is to be about the way science helps industry, not forgetting that these are educational talks – but their aim is to cut away from the science text books and reveal science as tightly interwoven in our everyday lives.⁵³

In keeping with this approach, much of *Science & Everyday Life* was dedicated to highlighting the household amenities that science had helped to invent, improve, or manufacture. Over the first four months of the series, *Science & Everyday Life* broadcast programmes on the role science had played in developing or improving: the automobile, plastic products, laundry detergents, cotton fabrics, bread, vacuum flasks, radio sets, wool, felt, fermentation products “from solvents to streptomycin”,⁵⁴ paint, jam, leather, rayon and nylon products, clean water supplies, and paper products. In the fall of 1948 Clow brought in Dr. Peter Sykes to describe “how coal tar is used as a source of dyes, drugs, and a hundred and one other things used in our everyday lives”⁵⁵ – as part of a six programme series on “the ways in which science contributes to our day to day needs.”⁵⁶ In his last syllabus for the series, Clow summarized the lesson

⁵¹ Clow to D.T., “Syllabus for ‘Science in Daily Life.’”

⁵² Clow to D.T., “Syllabus for ‘Science in Daily Life.’”

⁵³ Archie Clow to D.T., “Science & Everyday Life,” Memorandum, (October 20, 1947), R51/530, Written Archives Centre.

⁵⁴ “Science and Everyday Life,” *The Radio Times*, no. 1256 (November 7, 1947): 23.

⁵⁵ Archie Clow to H.T.D., “Science & Everyday Life,” Memorandum, (July 26, 1948), R51/530, Written Archives Centre.

⁵⁶ Clow to H.T.D., “Science & Everyday Life,” July 26, 1948.

listeners were expected to take from this aspect of the series: “In fact the amenities science is creating are profoundly changing our whole way of life.”⁵⁷

Science was not just meeting people’s needs at home, however; it was also meeting the needs of mankind. To show this, Clow often contrasted the state of the modern world with the state of the world before it had learned the value of science. In the syllabus for a series in the fall of 1948, for instance, Clow explained:

If we pause for a moment to consider what our simplest demands are it’s clear that they include a need for food and water, shelter, and warmth, whether it be from clothing or houses. These have been our demands since prehistoric times but without the application of science some of them were very inadequately met: by water that carried diseases like cholera and typhoid with it: by supplies of food that were inadequate and ill-balanced: by houses that could only be kept warm by the wasteful consumption of precious coal.⁵⁸

The series painted a picture of a world that was being revolutionized by the application of scientific knowledge and know-how to industry. Over the years Clow repeated this refrain to show that science was meeting the needs of mankind in a wide range of areas, including:

- Food: “Man has been producing food for countless ages but it is only within the last hundred years that he has had much help from science.”⁵⁹
- Nutrition: “For millions of years man selected his food from available supplies on the ‘little of what you like’ principle. The rise of nutritional science has given us however, a much clearer picture of our food requirements [...]”⁶⁰
- Clothing and Housing: “In the same way as it has modified our clothes, science is also helping to bring about changes in the traditional ways of building houses.”⁶¹
- Community living: “... science is beginning to contribute to the broader problems of community living. The traditional village or town was usually a haphazard growth,

⁵⁷ Archie Clow to Supervisor, Educational Talks, “F.E.B. Syllabus: Series VIII: ‘Science & Everyday Life,’” Memorandum, (September 13, 1951), R51/530, Written Archives Centre.

⁵⁸ Clow to H.T.D., “Science & Everyday Life,” July 26, 1948.

⁵⁹ Archie Clow to H.T.D., “Forces Educational Broadcasts: Series 2 ‘Science & Everyday Life,’” January 6, 1949, R51/530, Written Archives Centre.

⁶⁰ Clow to H.T.D., “Forces Educational Broadcasts: Series 2 ‘Science & Everyday Life.’”

⁶¹ Archie Clow to H.T.D., “Science & Everyday Life: Series III,” Memorandum, (Undated), R51/530, Written Archives Centre.

but, aided by a social survey of human habits, new communities can be built so as to satisfy a given plan for living.”⁶²

- Roads: “The special knowledge and methods of the scientist and engineer are increasingly used to ensure that the roads of the country [are safe].”⁶³
- Railways: “As with roads, railways at first made little use of science but that is no longer so.”⁶⁴

Throughout *Science & Everyday Life* Clow borrowed from Lancelot Hogben to frame scientific advance in terms of mankind mastering or conquering nature through scientific knowledge and know-how. As Clow explained to management in September 1951:

It is through the activities of scientists, and by using what they have found out in the form of technology, that man has up to now strengthened his hold on the earth and extended the range of his senses and activities.⁶⁵

Clow was most forceful about this aspect of *Science & Everyday Life* in a spring 1950 series on electrical apparatus. It is worth producing in full. “The history of man”, Clow wrote to management on 3 April 1950:

... is largely the record of his efforts to become master of the situation in which he finds himself on the earth. To do this he has set out to understand the processes of Nature ... an understanding that is in itself a form of mastery. Then he has gone on to use this understanding to remove limitations and reduce the odds against his survival set by Nature. The devastating brilliance of the lightning flash has been tamed and turned to his own more domestic ends. In fact it is through electrical science and technology more than anything else that man has conquered distance and darkness and excessive heat and cold, and has reduced the havoc of disease and famine. The speaker’s purpose is to tell of some of these achievements of man the master.⁶⁶

The future, according to *Science & Everyday Life*, was one in which ‘man the master’ would conquer – and therefore no longer be circumscribed by – the limits of nature.

⁶² Archie Clow to A.H.T.D., “Science & Everyday Life,” Memorandum, (Undated), R51/530, Written Archives Centre.

⁶³ Archie Clow to A.C.T., “F.E.B. Series V 1949: ‘Science & Everyday Life,’” Memorandum, (Undated), R51/530, Written Archives Centre.

⁶⁴ Clow to A.C.T., “F.E.B. Series V 1949: ‘Science & Everyday Life.’”

⁶⁵ Clow to Supervisor, Educational Talks, “F.E.B. Syllabus: Series VIII.”

⁶⁶ Archie Clow to A/C.T., “F.E.B. Series IV 1950: ‘Science & Everyday Life’ Red Light Proposals,” April 3, 1950, R51/530, Written Archives Centre.

In light of the above, one could view *Science & Everyday Life* as a rather traditional series about the benefits of science, of the kind so often encountered in popular science. While this was certainly one aspect of the series, Clow was ultimately attempting to do much more than demonstrate the social benefits of scientific research. He was, in fact, trying to teach listeners to see the world as social technologists.

3.3. Social Technology in ‘Science & Everyday Life’

Clow explained as much in the last syllabus he wrote for the series in September 1951. The series would continue until July 1952, but as Archie Clow was feeling overworked management moved to relieve some of the pressure he was under by hiring an interim producer: Nan Clow.⁶⁷ Perhaps aware that this would be his last series in charge, Archie took the opportunity to summarize the rationale and approach of the series over the previous four years. He explained that a proper understanding of the impact of science on everyday life required not only an understanding of the role science played in industry, but required an understanding of the myriad other forces at work within industry more generally. “So involved is science with everyday life”, he wrote in his final syllabus, “that the background to virtually any commodity involves not only science and technology but it’s made up of geographical, economic, historical and social aspects as well.”⁶⁸ To teach listeners about this ‘background to commodities’, Clow invited onto *Science & Everyday Life* several speakers, “each of whom”, he noted, would “make it his business to put across one part of the story.”⁶⁹ “So the scientist”, Clow explained to management:

... will be supported by (forgive the high falutin’ names) the economic geographer, the scientific historian, and the social technologist – the chaps who know the ‘where from’, the ‘how come’ and the ‘how much’ which make up the story of science in everyday life.⁷⁰

Throughout the series, Clow attempted to introduce listeners to the way that social technologists viewed the world, and to teach listeners a few tools of the trade. Thus, when Clow had asserted in his 1946 ‘Science and Radio’ talk that listeners required programmes that conveyed ‘background information about science’ he meant programmes that not only

⁶⁷ Nan would be in charge of the series from January to July 1952

⁶⁸ Clow to Supervisor, Educational Talks, “F.E.B. Syllabus: Series VIII.”

⁶⁹ Clow to Supervisor, Educational Talks, “F.E.B. Syllabus: Series VIII.”

⁷⁰ Clow to Supervisor, Educational Talks, “F.E.B. Syllabus: Series VIII.”

demonstrated the material benefits of science, but programmes that educated listeners about the complex web of interconnecting forces behind everything from the national economy to household amenities, and the crucial role played by science within that web. Indeed, in Clow's mind one could not fully comprehend the importance and beneficial impact of science without understanding the role played by science within industry and the national economy. This is what Clow meant when he stated that *Science & Everyday Life* would set out to teach listeners about the role science played 'behind the counter'.

Throughout his four years in charge of *Science & Everyday Life*, Archie strove to introduce listeners to the myriad economic, social, intellectual, and material forces that made up the background to industry, as well as the extent to which these forces interacted with and affected each other. Within the last six-part series of 1947 alone, listeners were introduced to: the important place of raw materials in the national economy (26 November); the effect of legislation on the health and safety of processed foods (3 December); the effect of war on the availability of important raw materials (10 December); the effect of synthetic silk on fashion – a talk that Clow described as “the sociology of clothes” (17 December);⁷¹ the continuous research required to ensure a safe water supply and the effect of clean water on the nation's health and hygiene (31 December); and the effect of the location of raw materials on the location of various industries (7 January 1948). Clow also made sure to introduce listeners to what in *The Chemical Revolution* he and Nan had called “the many social relations of discoveries”.⁷² The fourth series of 1948, for instance, included three programmes that examined “how the dyestuffs industry contributed to the discovery of bacteria.”⁷³

Clow also often sought to demonstrate what in *The Chemical Revolution* the Clows had referred to as the ‘fundamental position’ of materials in industrial economies. Thus, the first two series of 1950 focused on “important materials ... materials that give the shape and pattern to the kinds of lives we lead today.”⁷⁴ For thirteen weeks from the beginning of January through the end of March, *Science & Everyday Life* detailed the efforts of scientists to ensure a steady supply of iron, steel, aluminium, magnesium, tempered steel, timber, glass, concrete, tin, lead, oil, petrol,

⁷¹ Clow to D.T., “Science & Everyday Life.”

⁷² Clow and Clow, *The Chemical Revolution*, 43.

⁷³ Archie Clow to H.T.D., “Science & Everyday Life,” Memorandum, (April 15, 1948), R51/530, Written Archives Centre.

⁷⁴ Archie Clow to A.C.T., “F.E.B. Series II 1950: ‘Science & Everyday Life’ Green Light Proposals,” December 19, 1949, R51/530, Written Archives Centre.

rubber, rayon, plastics, nylon, and penicillin.⁷⁵ The programmes not only detailed the important place of these materials within industrial economies, but the efforts of industrial scientists to produce stronger, lighter, and more durable materials and to do so more cheaply and efficiently.

Clow further demonstrated the fundamental position of important materials by regularly asking listeners to imagine what might happen if the availability of an important material suddenly decreased. In the syllabus for the last series of 1951, for instance, Clow asked army instructors to lead forces personnel in a discussion of the question: “What would happen if we were deprived of this material?”⁷⁶ In effect, Clow would detail the interconnections of a diagram like the one on sulphuric acid in Chapter 2.3 above and then encourage listeners to imagine the wide range of industries that would be affected if those industries were deprived of a certain raw material or industrial chemical. The programme, ‘Bottles and Windows: The importance of glass in modern life’,⁷⁷ for example, demonstrated this importance by asking listeners: “take away windows and beer bottles and where are you?”⁷⁸

At their core, many of these programmes were attempts to demonstrate where society would be without science. If science were to stop applying itself to industry and to the needs of mankind, so the argument went, the modern world would forfeit all the gains of the past two hundred years. In the syllabus for the aforementioned series ‘Important Materials’, for instance, Clow described the scientific knowledge required to produce that “small number of materials with unique properties that determine the sort of lives we lead”.⁷⁹ He then pondered the shape of a future without these materials or the knowledge required to produce them: “without them, well, we’d go back to the Stone Age pretty quick.”⁸⁰ Introducing listeners to the role science had played in inventing, improving, and manufacturing their favorite commodities was therefore Clow’s way of convincing listeners of the necessity of continuing to apply scientific knowledge and know-how to the problems of industry and to the needs of mankind. In doing so, Clow was leveraging the past benefits of science to demonstrate the possibilities of the future just as Hogben had outlined in *Science for the Citizen*.

⁷⁵ Archie Clow to A.C.T., “F.E.B. Series I 1950: ‘Science & Everyday Life,’” November 7, 1949, R51/530, Written Archives Centre; Clow to A.C.T., “F.E.B. Series II 1950.”

⁷⁶ Clow to Supervisor, Educational Talks, “F.E.B. Syllabus: Series VIII.”

⁷⁷ “Bottles and Windows,” Radio Broadcast, *Science and Everyday Life* (Light Programme, December 13, 1951).

⁷⁸ Clow to Supervisor, Educational Talks, “F.E.B. Syllabus: Series VIII.”

⁷⁹ Clow to A.C.T., “F.E.B. Series I 1950.”

⁸⁰ Clow to A.C.T., “F.E.B. Series I 1950.”

Ultimately, Clow measured the success of the series not by whether listeners had mastered the skills required to see the world in the same way that a social technologist like he or Nan might, but by whether listeners had arrived at the same conclusions. The hope was that by walking listeners through the same process that he and Nan had taken in researching *The Chemical Revolution*, and by introducing listeners to the same evidence that their research had uncovered, listeners would come to see that science was the key to increasing the efficiency of the national economy and the social machine.

Convincing listeners about these points was made all the more urgent by the position in which the country found itself after the war. Writing *The Chemical Revolution* had convinced Archie that wedding science to industry had fostered economic development and ministered to social needs during the latter half of the eighteenth century. Clow was therefore convinced that a similar application of science to industry was the key to a swift recovery from the war. “With Britain fighting desperately to close the gap between her imports and exports,” Clow wrote in the syllabus for a series in the fall of 1947:

... science must be used to the utmost to produce goods of the highest quality as cheaply as possible. In view of this, a large part of Science & Everyday Life is to be about the way science helps industry [...].⁸¹

In Aberdeen, the talk had been about progressing to the next age – the ‘neotechnic’ age for Mumford and the ‘age of plenty’ for Hogben – but in the years following the Second World War Clow shifted his sights to more immediate concerns.

Part of the lesson that Clow hoped to convey to listeners through *Science & Everyday Life* was that they themselves could aid the nation’s recovery by applying the things they learned to their own lives. Within these programmes Clow sought to educate listeners not about the rate of decay of a plutonium atom or the force of gravity, but about the limited and therefore precious nature of energy, the importance of efficiency, and the various ways that science could help listeners make better use of their own precious resources. For instance, the 22 September 1948 programme aptly titled, ‘An Energy Bank Account’, introduced listeners to the rudiments of the social technologist’s energy balance sheet. “In the end all the energy of human activity comes from the Sun”, Clow noted in the syllabus for the series: “When we grow crops and use them we

⁸¹ Clow to D.T., “Science & Everyday Life.”

are using our current account: when we dig up coal from the earth we are using up capital.”⁸² The following programme, ‘How we use our energy capital’, went on to examine “our scientists’ endeavours to get as much as possible of the useful heat out of coal” in the important attempt to increase the efficiency of mankind’s use of energy.⁸³ More directly, the 5 April 1950 programme, ‘What’s the Oil Can for?’ – the first of a six-part series on scientists’ attempts to increase the efficiency of the armed services – laid out the importance of lubrication. “In this talk”, wrote Clow in the series syllabus:

Ian Boyd explains what the experts have to say about lubrication and also what you can do to use this information ... whether it’s applied to an army vehicle you have charge of, or to your wife’s sewing machine, or your girl friend’s bicycle.⁸⁴

Thus, *Science & Everyday Life* was not only about convincing listeners to support science, but was in part an attempt to show listeners what they could do to actively aid the recovery effort.

3.4. *Experiments in presentational style*

So committed was Clow to using *Science & Everyday Life* to convince listeners of the necessity of wedding science to industry that he became frustrated when it appeared they were not comprehending the message of the series. Four months after the start of the series Clow received an audience research report that suggested listeners were finding the programmes overly-technical and largely incomprehensible. Clow therefore set out to examine the education level of forces listeners. “To establish some norm I have made a careful check on the science being taught in schools of various types”, Clow wrote in a 19 January 1948 memo:

... and as a result am forced to the conclusion that the ability of our forces listeners to absorb science is (with some conspicuous exceptions it is true) to be compared with school children in the 12 minus age group. I’m quite certain it cannot be higher. This being so certain things follow. The listener’s span of attention for one voice and subject does not run to fifteen minutes. The listener’s knowledge of the material world around

⁸² Clow to H.T.D., “Science & Everyday Life,” July 26, 1948.

⁸³ Clow to H.T.D., “Science & Everyday Life,” July 26, 1948.

⁸⁴ Archie Clow to A/C.T., “F.E.B. Series III 1950: ‘Science & Everyday Life’ Green Light Proposals,” January 25, 1950, R51/530, Written Archives Centre.

him, in the sense of how and why things are done that way, is about zero. Their interest in their surroundings is less than the educationalists lead us to believe.⁸⁵

This was actually a rather common complaint amongst those working on Forces Educational Broadcasts. Indeed, one producer of FEBs claimed forces listeners lacked “even the rudimentary attainments of the primary school”.⁸⁶ Briggs points out, however, that by the late 1940s the forces personnel listening to these broadcasts would not have been soldiers waiting to be demobilized, but rather conscripts who had recently entered the services. As such, they were often not only young – many would have been 18 years old – but, as Briggs writes, would have had “their school education interrupted by the blitz and by evacuation”.⁸⁷ Furthermore, many units were unable to carve out time to listen to each programme in a six-week series, which would have made it difficult to piece together a larger moral spread out over those weeks.

In spite of this, Clow drew some distressing conclusions about his efforts to communicate the importance of applying science to industry. “As a result”, he wrote in his 19 January 1948 memo, “the implications of the recent talks in Science and Everyday Life have been missed.”⁸⁸ In particular, he seemed irked by forces listeners’ responses to a programme on the “ways in which science can combat the loss [of food] due to pests during storage”.⁸⁹ Clow lamented that even after listeners were informed that the food “known to be destroyed by pests would maintain a world population of four hundred million people”, one listener responded “Is it really important?”⁹⁰ With more than a trace of frustration Clow concluded: “They just don’t see that scientific efficiency in British industry is vital to our economy.”⁹¹

This did not dissuade Clow from continuing his efforts, but it did impress upon him the need to alter his approach. To ensure that listeners understood the important lesson he was trying to impart, Clow proposed changing the presentation style of *Science & Everyday Life* from 15-minute lecture-style talks by industrial scientists, to a “radio-magazine [...] of several short items”.⁹² More importantly, he proposed that from then on the series should be “more definitely instructional than hitherto” and that each broadcast should be presented by the science writer

⁸⁵ Archie Clow to D.T., “Science in Forces Educational Broadcasts,” January 19, 1946, R51/530, Written Archives Centre. Original emphasis.

⁸⁶ Briggs, *Sound and Vision*, 4:741.

⁸⁷ Briggs, *Sound and Vision*, 4:741.

⁸⁸ Clow to D.T., “Science in Forces Educational Broadcasts.”

⁸⁹ “Science and Everyday Life,” *The Radio Times*, no. 1253 (October 17, 1947): 15.

⁹⁰ Clow to D.T., “Science in Forces Educational Broadcasts.”

⁹¹ Clow to D.T., “Science in Forces Educational Broadcasts.”

⁹² Clow to D.T., “Science in Forces Educational Broadcasts.”

A.W. Haslett. In addition to being the author of a book on “unsolved problems of science”,⁹³ Haslett was a founding member of the Association of British Science Writers, editor of the weekly science newsletter *Science Today*, and one-time science correspondent for the *Morning Post*.⁹⁴ The previous summer Haslett had served as presenter for a series of five Home Service broadcasts from the British Association for the Advancement of Science meeting in Dundee, and in 1948 would become a regular presenter of science programmes on the BBC’s General Overseas Service. Clow explained that as presenter of the new magazine format of *Science & Everyday Life*, Haslett would be in charge of introducing the programme, answering questions sent in by listeners, and introducing any scientists who joined him at the microphone. After each talk by a visiting scientist, Haslett would have the responsibility of summing up for the audience. Ultimately, according to Clow, Haslett was there to “point [out] the moral and make the implications of the information doubly clear”.⁹⁵ Thus, when it appeared listeners were not understanding the message of *Science & Everyday Life*, Clow stopped entrusting his important message to practicing scientists and instead entrusted it to a science writer who could explain important points and could work to ensure listeners understood what had been said by scientists.

The sudden transition from straight, lecture-style talks to a magazine format would not have been overly jarring for those working within the SEU. As Clow had mentioned in his 1946 talk at the ‘Science and Radio’ conference, the culture of the unit was one of experimentation wherein widely varied styles of presentation were utilized in order to examine their effect on listener enjoyment and comprehension. This was, in fact, the manner in which Clow approached the transition from straight talks to magazine format, referring to the installation of Haslett as compère as an “experiment” that would likely “furnish some further useful data”.⁹⁶ After six weeks of the experiment, Clow could report that the new magazine format was “being welcomed by the Forces” and that there had been “favourable comments on Haslett as compère”.⁹⁷ By the start of the next series in autumn 1948 Clow had decided that *Science & Everyday Life* was at its best when it aimed to be “something between the unadorned talk and the ‘over-snippetty’ magazine”.⁹⁸

⁹³ Arthur Woods Haslett, *Unsolved Problems of Science*. (London: G. Bell & Sons, 1935).

⁹⁴ “A.W. Haslett,” *Nature* 223, no. 5205 (August 2, 1969): 545–46.

⁹⁵ Clow to D.T., “Science in Forces Educational Broadcasts.”

⁹⁶ Archie Clow to H.T.D., “Science & Everyday Life,” Memorandum, (February 17, 1948), R51/530, Written Archives Centre.

⁹⁷ Archie Clow to H.T.D., “F.E.B. Syllabus: Series IV: Science,” April 1, 1948, R51/530, Written Archives Centre.

⁹⁸ Archie Clow to H.T.D., “F.E.B. Series VI: Science & Everyday Life,” June 1948, R51/530, Written Archives Centre.

By 1952 Clow had come across even more evidence that seemed to support his decision to generally avoid the ‘unadorned talk’ – and this time the evidence came not from Archie’s own programmes, but from Nan’s. When Nan took over *Science & Everyday Life* in 1952 she took the opportunity to perform an experiment, the aim of which was to “investigate the suitability of various forms of presentation, so as to discover which might be considered the most suitable for this particular level of audience.”⁹⁹ From 22 November 1951 to 12 June 1952 *Science & Everyday Life* broadcast five short series utilizing an assortment of seven different presentation styles, which Nan listed as:

- 1) ‘Straight’ Talks
- 2) ‘Ornamented’ Talks
- 3) Discussions (scripted)
- 4) ‘Brains Trusts’ (scripted)
- 5) [Outside Broadcasts from] Research Institutes (unscripted but previously rehearsed)
- 6) Talks with dramatic insets
- 7) Complete features¹⁰⁰

By 19 June 1952, Nan could report that the audience research conducted over the previous six months showed that “each type of programme has its advantages and disadvantages.”¹⁰¹

The straight talk, according to Nan, appealed to the “more intelligent listener who likes to get his facts authoritatively”, but for the majority of forces listeners “one voice speaking unbroken for 15 minutes is too long”.¹⁰² She therefore recommended that when it came to science programmes for the forces, “some form of dilution of the scientific material” was beneficial, even if just a change of voice.¹⁰³ Thus, Nan recommended that much better results could be obtained by sending a correspondent to a research laboratory than could be obtained by bringing a practicing scientist to Broadcasting House. During Nan’s six month experiment, for instance, an outside broadcast from a research laboratory investigating methods of fireproofing buildings (‘Help! Help! – Fire’¹⁰⁴) was presented by long-time BBC contributor and presenter, Sam Pollock, known to listeners for his contributions to the FEB ‘Industrial and Economic

⁹⁹ Nan Louise Clow, “Report on F.E.B.s - Science and Everyday Life,” June 19, 1952, 1, R51/530, Written Archives Centre.

¹⁰⁰ Clow, “Report on F.E.B.s - Science and Everyday Life,” 1–2. Of the five short series used for the experiment, the first (22 November 1951 – 20 December 1951) had been produced by Archie before Nan took over.

¹⁰¹ Clow, “Report on F.E.B.s - Science and Everyday Life,” 2.

¹⁰² Clow, “Report on F.E.B.s - Science and Everyday Life,” 2.

¹⁰³ Clow, “Report on F.E.B.s - Science and Everyday Life,” 2.

¹⁰⁴ “Help! Help! - Fire,” Radio Broadcast, *Science and Everyday Life* (Light Programme, May 8, 1952).

Magazine' *World of Work* (1945-1948), and his reports on industrial matters as a 'special correspondent' for the BBC. Such an approach was particularly helpful, Nan explained, whenever "new and unpractised speakers were involved."¹⁰⁵ The important thing to note about Nan's experiment is that the 'dilution of scientific material' which she advocated was often achieved by recruiting professional journalists or broadcasters to work alongside contributing scientists.

If Archie Clow's time in the SEU taught him anything it was the value of these different formats and presentation styles. Even during his first year in the SEU Clow produced programmes ranging from straight talks by practicing scientists or discussions between experts to magazine programmes chaired by science writers, reports from research laboratories delivered by trained correspondents, and dramatized features programmes written by BBC personnel. The first two formats entrusted scientists with a good deal of control over the framing and delivery of information about science; the latter formats entrusted this control to professional communicators or BBC personnel. Implicit within this commitment to a wide range of presentation styles was an understanding that in certain cases scientists were not the best qualified to deliver important information about science. As will be seen, questions of who should be in charge of communicating information about science to the British public would recur throughout Clow's tenure at the BBC.

Clow's belief that scientists were not always the best qualified communicators applied not only to the proposed presentation style of a programme, but to the proposed subject matter of a programme as well. Writing in his final syllabus in 1951, Clow explained that since the background to every commodity involved not only science but myriad "geographical, economic, historical, and social aspects" as well, this meant that "the scientist talking about science" was only telling "part of the story".¹⁰⁶ Unfortunately, according to Clow, scientists were often not in a position to educate the public about these other parts of the story. "Science teachers in charge of laboratories often just haven't the time or opportunity to explore the social implications of their subject", wrote Clow: "This is where the B.B.C. with its great resources can help."¹⁰⁷ This makes sense when viewed within the remit of the SEU. The unit was, after all, an explicitly educational service. However, Clow was not simply urging the BBC to take over from scientists and convey the same type of information that scientists themselves would have conveyed to the public had

¹⁰⁵ Clow, "Report on F.E.B.s - Science and Everyday Life," 2.

¹⁰⁶ Clow to Supervisor, Educational Talks, "F.E.B. Syllabus: Series VIII."

¹⁰⁷ Clow to Supervisor, Educational Talks, "F.E.B. Syllabus: Series VIII."

they been freer to do so. Rather, he was urging the BBC to go further and explore the social implications of science – the material benefits of science, the social technologist’s energy balance sheet, background information of science, etc. – in a way that Clow felt many practicing scientists were unable to do themselves. Thus, Clow saw *Science & Everyday Life* – and his work at the SEU more generally – as fulfilling an important parallel but cooperative effort with scientists to educate the public about the impact of science on their everyday lives, and about the need to apply science to industry to ensure a proper recovery from the war.

In the Services Educational Unit Clow found a broadcasting culture that suited his functionalist goals, melding educational aims with a creative approach to style. As will be seen in the next chapter, however, just a year after joining the SEU, Clow discovered that the rest of the BBC worked to rather different priorities.

Chapter 4:

Prestige versus Good Radio

Science & Everyday Life was not the only long-running science series launched on the Light Programme during the latter half of the 1940s. In May 1946 the network broadcast the first episode of *Science Survey*, a half-hour, weekly series organized as a collection of 15-minute, lecture-style talks by eminent scientists. The series was under the direction of Ian Cox, a trained geologist and former Cambridge researcher who, among his many other exploits, had taken part in the 1931 Oxford University Hudson Strait Expedition to Akpatok Island on the edge of the Arctic Circle.¹ Cox had produced science programmes for the BBC from 1936 to 1939, including the short-lived topical science series, *Science Review*, but had left the BBC soon after the declaration of war to serve in the forces. After six and a half years in the Royal Navy, Cox had returned to the BBC and had set about developing what would become *Science Survey*.

Within five months of the series debut, *Science Survey* had been transferred to the Home Service, Ian Cox had signaled his intention to leave the BBC, and management had asked Clow for his thoughts on the future of the series.² As will be seen, Cox and Clow shared a number of assumptions about the role that science could and should play in post-war Britain and about the need to educate the public about science. Cox's efforts at addressing these matters through *Science Survey*, however, left Clow less than impressed. To understand why, requires an understanding of Cox's approach to the series.

4.1. *Science Survey under Ian Cox*

Ian Cox envisioned *Science Survey* as a platform from which eminent scientists could speak directly to the public about developments in science. This approach had been engrained in the series early in the planning process – despite the fact that Cox was initially asked to develop a

¹ Ian Cox, "Eskimo Remains on Akpatok Island, North-East Canada," *Man* 33 (April 1933): 57–61.

² It is not clear from archival evidence whether by this time Clow had already moved from the SEU to the Talks department. Nor is it clear whether he had already been formally offered the position as the next producer of the series.

very different series. When Norman Collins, the newly appointed Head of the Light Programme, wrote to the Talks department in 1945 asking for a new science series, he asked for “a really first-rate [...] half-hour popular scientific programme” similar in style to *Your Questions Answered* – an immensely popular radio programme during which a panel of academics and intellectuals would attempt to answer a wide range of listener questions.³ Collins based his argument that the new series should be developed for the Light Programme – rather than for the more serious Home Service where such a programme might normally have been placed – on “the fact that upwards of 90% of the questions which have come in for ‘Your Questions Answered’ have dealt with scientific topics.”⁴ In his first draft of the series Cox confirmed that, as per Collins’s request, the main objective of the new series would be: “To provide answers where possible to the many questions (general and particular) that are puzzling people from day to day.”⁵ Two weeks later, however, Cox shifted the focus of the series.⁶ From then on it was to be a series dedicated to showcasing the results of modern scientific research, and to conveying something of the daily life of a scientist. This was much more in line with Cox’s previous programmes; the best example of this being *Scientists at Work* (1936),⁷ a 12-part series produced by Cox during which, in the words of the *Radio Times*, “working scientists themselves [...] told listeners about the investigations on which they are engaged, the problems they are faced with, and the methods they are using to solve them.”⁸

Similarly, though Collins had asked for a lively question and answer programme that would utilize sound effects “as freely as possible” and might even bring members of the public to the microphone to ask questions directly, by the second draft of the proposed series Cox had dropped both the question and answer format and the sound effects. He instead fashioned the series into one composed primarily of lecture-style talks by eminent scientists. This, too, was more in line with Cox’s previous programmes, nearly all of which consisted of similar lecture-style talks.

³ Norman Collins, “Science Magazine (Extract from Mr. Norman Collins’ Memo of 19th December 1945),” December 19, 1945, R51/533/1, Written Archives Centre.

⁴ Collins, “Science Magazine (Extract from Mr. Norman Collins’ Memo of 19th December 1945).”

⁵ Anonymous (but most likely Ian Cox), “Science - Weekly Half Hour Programme,” February 5, 1946, R51/533/1, Written Archives Centre.

⁶ Ian Cox to Head of Light Programme, “Science Period - 30 Minutes Weekly,” February 18, 1945, R51/533/1, Written Archives Centre.

⁷ *Scientists at Work* ran on the National Programme from 6 October to 22 December 1936.

⁸ “Scientists at Work: The Humanity of Science,” *The Radio Times*, no. 690 (December 18, 1936): 62.

⁹ Collins, “Science Magazine (Extract from Mr. Norman Collins’ Memo of 19th December 1945).”

The fact that Cox was able to re-cast both the content and presentation style of the proposed series is not entirely surprising, however. As Allan Jones has written, science producers like Cox, and his predecessor Mary Adams:

... 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.¹⁰

Adams, for instance, produced numerous ‘science and society’ talks, many of them delivered by speakers from the liberal end of the political spectrum, including a number from speakers involved with the social relations of science movement.¹¹ Cox, on the other hand, pronounced himself “very frightened” of programmes that concerned themselves with “the applications of scientific results to the layman’s life and philosophy.”¹² For him, such programmes encouraged the public to put too much faith in science since they awakened “the longing (latent in most people) for a ‘Universal Panacea’”.¹³ In contrast with Adams, Cox eschewed ‘science and society’ talks in favor of topical science programmes and programmes that showed modern scientific research in action.

This does not mean producers had carte blanche when it came to science programmes, or that they could ignore explicit instructions from their superiors. It does mean that neither of these two producers seems to have been forced to adhere to a pre-determined style of science programming, or adopt an officially-sanctioned framing of science. Despite their divergent views on science broadcasting, established producers like Adams and Cox appear to have largely been given the freedom to produce the types of programmes they thought best.

In planning *Science Survey*, Cox took full advantage of this freedom. The series would attempt to serve the post-war public not by examining the implications of modern scientific research, but by reserving a weekly 30-minute slot for lecture-style talks about the results of modern research delivered by scientists drawn from the upper-echelons of British science. Considering what this thesis has already uncovered about Clow’s approach to science broadcasting, it is unsurprising that Clow disagreed with much of this approach.

¹⁰ Jones, “Speaking of Science,” 119.

¹¹ Jones, “Speaking of Science,” 102.

¹² Jones, “Speaking of Science,” 121.

¹³ Jones, “Speaking of Science,” 120.

When the series debuted in May 1946, the BBC's own promotional material noted with pride that the launch of *Science Survey* marked "an important day both to the listener and to [...] British science" since for "the first time in British radio history there is to be a long and regular weekly period in which scientists themselves will talk about their work and current topics."¹⁴ To ensure that the series would "catch [the audience's] interest and imaginations" without being "inaccurate or over-coloured",¹⁵ the series would feature esteemed physicist and *Times* Scientific Correspondent E.N. da C. Andrade as scientific director, editor, and presenter. To help launch the series with a bit of pomp, Cox invited Robert Robinson, President of the Royal Society, and Edward Appleton, Secretary of the Department of Scientific and Industrial Research (DSIR), to join Andrade in the first programme. After the broadcast, Cox and the speakers retired to a nearby room for a celebratory cocktail party hosted by the Corporation – the guest list to which included two dozen eminent British scientists, among them the Secretary of the Royal Society; the Astronomer Royal; the Director of the National Physical Laboratory; and the President of the BAAS.¹⁶

¹⁴ Unknown Author, "Science Survey (Weekly on Fridays 6.30-7.0pm Light Programme. Beginning 3rd May 1946.)," Memorandum, (April 1946), R51/533/1, Written Archives Centre.

¹⁵ Unknown Author, "Science Survey (Following on Professor' Andrade's Article)," Memorandum, (April 1946), R51/533/1, Written Archives Centre.

¹⁶ Ian Cox to Head of Light Programme, "Weekly Half-Hour Science Period - Light Programme," March 15, 1946, R51/533/1, Written Archives Centre. It is unclear how many of the invitees actually attended. Cox noted that of the 24 invitees, only 12 might be able to accept.

Programme

s) :: 261.1 metres (1,149 kc/s)

INGTON
 , Wimbledon
Gade
Toye
J. Strauss
Ponce
Kern
Gershwin
Kern
Revel
 an and Lewin
Adams
Coward

OUR
 chestra, con-
 gress, with
 ne)
 .Mendelssohn
 Musketeers)
 Friml
Löhr
 p. 2.....Liszt
 neddy-Russell
 ed!.....Cowen
 ours
 Ponchielli
 mstance, No.
Elgar
 irmingham

SCIENCE SURVEY

in which leading scientists
speak in a programme
edited by Professor E. N.
da C. Andrade, F.R.S., who
writes on page 3

THIS EVENING

Sir Robert Robinson, F.R.S., President
of the Royal Society, and Sir Edward
Appleton, F.R.S., Secretary of the
Department of Scientific and Industrial
Research, introduce the new series;
and Professor Andrade then asks
them to talk about some of their
own research work

LISTEN AT 6.30 P.M.

7.0 **Th**

7.10 TOM
Weekly pre
ing events

7.15 'IN
An interlude
and familiar
(violin) and
(BBC record

7.30 'HE
YOU
with Adèle
and Enid
Rita William
his Orchest
for Forces
'At the V
Harris fulfil
to meet
and Sterling
duced by A
Meehan. (C
(Ronald Ch
mission of

8.15
YOU
Second of
well-loved
duced with
Doris Arno

9.0 'ME
You are i
logged' \$
Ooze, nov
all to m

3.20 DAVID BUCHAN
at the piano, improvises on some of
the tunes you ask to hear in the
'Family Favourites' programmes

Figure 9: *Radio Times* article announcing the launch of *Science Survey* in 1946.¹⁷

During the broadcast, Appleton and Robinson took time to mark the momentousness of the occasion. Appleton noted that he welcomed the “new radio feature most warmly”,¹⁸ while Robinson thanked the BBC on behalf of all British scientists whom, he noted, were “indeed very grateful to the BBC for the allotment of a weekly half hour period which will be devoted to some aspects of their work.”¹⁹ Robinson went on to express his enthusiasm and high hopes for science broadcasting in the post-war world. “In broadcasting”, he explained:

¹⁷ “Science Survey,” *The Radio Times*, no. 1178 (April 26, 1946): 17.

¹⁸ Microfilm Script, *Science Survey* (Light Programme, May 3, 1946), 3, Radio Talks Scripts Pre-1970 (Film T463), Written Archives Centre.

¹⁹ May 3, 1946, 2.

... we have a medium not so personal nor so dramatic as a lecture can be, nor so permanent as a book, but one which combines these features in a unique manner which, above all, enable the largest number of speakers to reach the greatest audience.²⁰

Each of their talks was informed by the belief that the public had awoken to the importance of science, and to the role that science could play in achieving a speedy recovery from the war. Appleton, for instance, felt the post-war public had a “very real and widespread desire for up-to-date scientific information”, and postulated that it had come about “because the period between scientific discovery and exciting application has been so markedly reduced.”²¹ In his own introductory remarks, Andrade concurred: the war, he noted “has brought into the forefront science as a means of obtaining results of practical importance.”²² In a *Radio Times* article advertising the launch of the new series, he had gone even further:

Everyone realizes that it is largely by the aid of science that we are fed, warmed, carried, cured, clad, and entertained; everyone is keenly interested in these contributions to our material well-being.²³

The public, according to these eminent scientists, were eager for more information about science because they had seen during the war the ease with which seemingly esoteric work such as research into the behavior of radio waves could be made to benefit themselves, their families, their nation, and their world.

The speakers were equally convinced that in order to create science programmes that would satisfy the public’s newfound thirst for information about science, the programmes would need to be written, planned, and delivered by men²⁴ of science – *not* by science writers or professional broadcasters. Appleton made the most impassioned plea for scientific control of science programming:

To satisfy this very real and widespread demand for up-to-date scientific information we can go about the matter in two ways. You can either have the man of science himself or

²⁰ May 3, 1946, 2.

²¹ May 3, 1946, 3.

²² May 3, 1946, 4.

²³ E.N. da C. Andrade, “Today in the World of Science,” *The Radio Times*, no. 1178 (April 26, 1946): 3.

²⁴ At this time, they were almost always envisioning *men* of science. *Science Survey* does not appear to have broadcast a female scientist until Dr. Mary Lobban in 1956. “When Twenty-One Hours Make One Day,” Radio Broadcast, *Science Survey* (BBC Home Service Basic, March 22, 1956).

you can have an interpreter. I'm strongly of opinion that the former is preferable and that is why I support the plan for this series of programmes.²⁵

Andrade, too, felt scientists would make the best communicators of science. In his *Radio Times* article announcing the start of the series he asserted that there were many scientists who could “speak to a lay audience on technical matters” without “irritating patronage and condescension on the one hand or pedantry and obscurity on the other.”²⁶ Scientists, after all, were the ones with first-hand knowledge of the research being discussed. “[T]hough perhaps everyone wouldn't agree with me,” Appleton argued during the inaugural broadcast, “I firmly believe that the man who knows most about a thing is generally the best one to explain it.”²⁷ In his *Radio Times* article Andrade spoke for all involved in the production of *Science Survey* when he assured the audience that in the coming series, “nobody will ever be speaking on a subject of which he has not expert knowledge, on which he is not a recognised authority.”²⁸ Andrade and Appleton were confident in the ability of scientists to speak as clearly and as eloquently as ‘interpreters’, without committing the sins of exaggeration and inaccuracy to which they felt interpreters were prone. Both felt that in order to ensure that the public received accurate, non-biased information about science during the post-war period, scientists would need to be in control of the planning, writing, and delivery of science broadcasts.

²⁵ May 3, 1946, 3.

²⁶ Andrade, “Today in the World of Science,” 3.

²⁷ May 3, 1946, 3.

²⁸ Andrade, “Today in the World of Science,” 3.

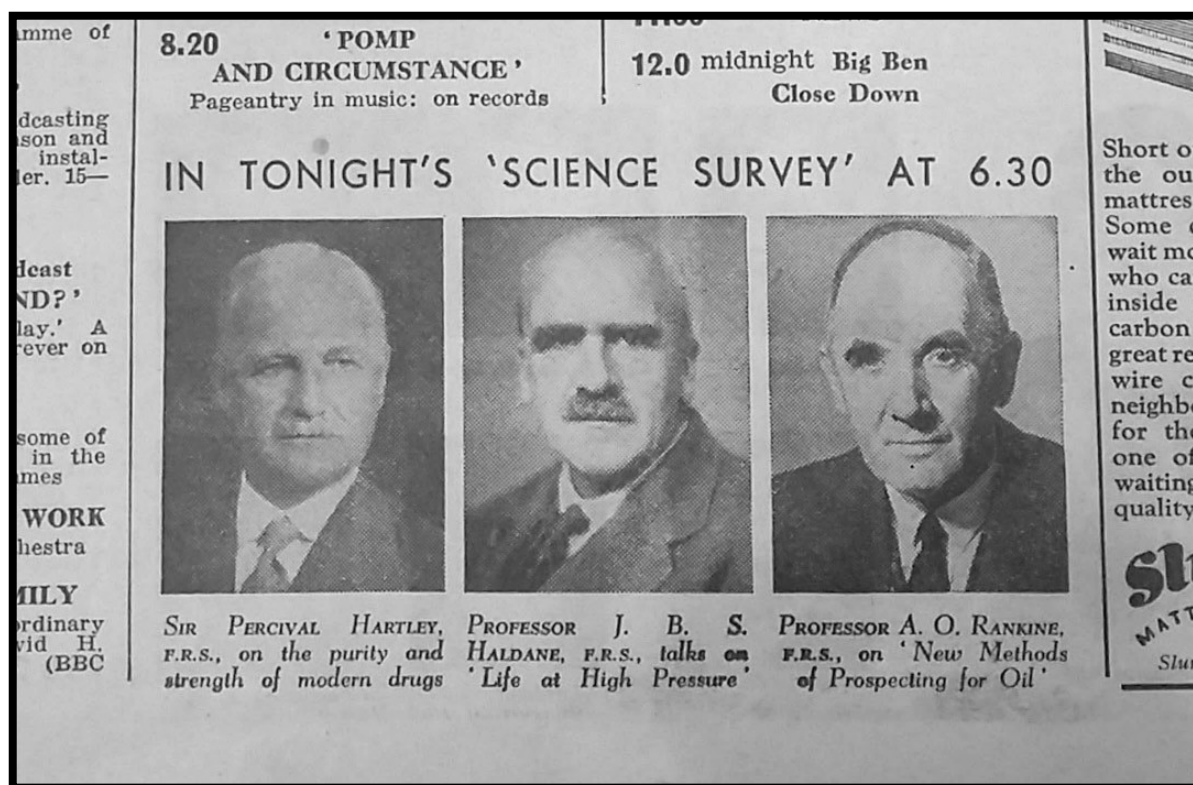


Figure 10: *Radio Times* advertisement for the 24 May 1946 broadcast of *Science Survey* featuring Percival Hartley, J.B.S. Haldane, and A.O. Rankine.²⁹

These two fundamental beliefs about post-war science broadcasting – that the public had awoken to the importance of science, and that scientists were the ones who could (and should) meet the new public demand for information about science – were held as strongly by Cox as they were by Andrade and Appleton. In fact, *Science Survey* was developed largely as a result of these perceived developments. A press release sent out in September 1946 to advertise the start of the second series of *Science Survey*, for instance, claimed: “The man of Science [...] has emerged from the ‘Backroom’ and a large part of the public is very glad to see him and to hear what he is doing.”³⁰

After bringing upwards of 50 eminent scientists to *Science Survey* over the first four months of the series, Cox was convinced that the faith he and Andrade had placed in scientists had been more than validated. As the September press release explained:

Before this programme began there was doubt whether the men from the front rank of Science were the most suitable to talk to a large audience, some thought that an

²⁹ “Science Survey,” *The Radio Times*, no. 1181 (May 17, 1946): 17.

³⁰ “Science Survey,” Memorandum, (September 1946), R51/533/1, Written Archives Centre.

‘interpreter’ (a scientific journalist, for example) would expound their material to better advantage. Now there is no doubt; the appreciations ‘Science Survey’ has received show conclusively that there are men in the front rank of Science capable of talking intelligently and delightfully on their own subject.³¹

Much of this confidence came, once again, from a belief that scientists would be able to communicate themselves better than interpreters because they had actual first-hand knowledge of the science being discussed.

Cox and Andrade further agreed that in order to satisfy this desire, the new series should focus on describing the results of modern scientific research. The way to “satisfy the public’s new demand”, the September 1946 press release argued, was by giving the public “a regular opportunity to hear its leading men of Science talking about their work and advances in their own future scientific fields.”³² There was no mention of explaining the social, economic, or philosophical implications of that research.

4.2. *Clow’s memorandum on the future of ‘Science Survey’*

Had the English biologist, C.D. Darlington, paused to scan the room before delivering his 18 September 1946 *Science Survey* talk, he likely would have noticed a slightly balding figure lingering unassumingly near the back of the recording studio.³³ To research his memorandum on the future of *Science Survey* Clow spent a number of Friday evenings observing the series in person and contemplating the effectiveness and popular appeal of talks such as Darlington’s ‘How I first saw a Chromosome’,³⁴ and Sir Edward Salisbury’s ‘Seed Time and Harvest’.³⁵ Though Clow, too, felt science had a crucial role to play in the recovery and felt that it was imperative that the public respect and support science, his time with Cox and Andrade convinced him that the BBC could do better.

³¹ “Science Survey,” September 1946.

³² “Science Survey,” September 1946.

³³ Clow, “Observations on Science Survey.” In his memorandum, Clow mentions that he directly observed *Science Survey* “in action” during September. Thus, Clow almost certainly witnessed Darlington deliver his talk on 18 September 1946.

³⁴ “How I First Saw a Chromosome,” Radio Broadcast, *Science Survey* (BBC Home Service Basic, September 18, 1946).

³⁵ “Seed Time and Harvest,” Radio Broadcast, *Science Survey* (BBC Home Service Basic, September 18, 1946).

Rarely one for equivocation, Clow made it clear from the very first sentence of his 7 October 1946 memorandum that he sought to overhaul *Science Survey*:

Since you have asked for my views as to the future of Science Survey, I think it might be useful at this point to examine the question of science broadcasting from the beginning, because any guiding principles or canons of practice that emerge may be useful in shaping future policy.³⁶

Lest management wonder whether the BBC even need bother with science programming, however, Clow asserted: “It can be taken as axiomatic that there is a place for science in serious broadcast programmes.”³⁷ As evidence of this, he pointed to the “importance attached to science columns by the daily press”, and to the fact that when the Home Service had broadcast repeats of his own FEBs, they had drawn listening figures of 8-15% – “a not insignificant” audience, he noted.³⁸

He then laid out the approach to science broadcasting that he hoped to bring to *Science Survey*, and strove to show how the adoption of this approach would necessitate drastic yet ultimately beneficial changes to the planning, production, and presentation of *Science Survey*. “Science broadcasts should not be confined to describing the achievements, and methods of science,” he argued, “but should deal honestly with its limitations, and with its influence on contemporary thought.”³⁹ In contrast with Cox who had previously pronounced himself ‘very frightened’ of programmes that attempted to apply scientific results to the life and philosophy of listeners, Clow argued that one of the primary aims of the BBC’s flagship science programme should be “to enlarge peoples [sic] understanding of themselves, and their surroundings, and discuss with them the effect of [science] on modern thought.”⁴⁰ Not surprisingly, Clow was arguing that science programmes should help listeners make sense of the place of science in modern society, and should do so by engaging with every aspect of science – its effect on the social, political, economic, philosophical, and industrial framework of the modern world. Thus, it was not enough to describe the achievements of modern science; one had to also describe the effect that those achievements would have on modern society. What is more, one had to

³⁶ Clow, “Observations on Science Survey.” Clow’s memorandum is undated, but a later letter refers to Clow’s memo as being sent on 7 October 1946. Harman Grisewood to R.A. Rendall, “Observations by Dr. Clow on ‘Science Survey,’” Memorandum, (October 14, 1946), R51/533/1, Written Archives Centre.

³⁷ Clow, “Observations on Science Survey.”

³⁸ Clow, “Observations on Science Survey.”

³⁹ Clow, “Observations on Science Survey.”

⁴⁰ Clow, “Observations on Science Survey.”

describe the beneficial effect that previous scientific achievements had had on civilization over the past two hundred years.

Clow then outlined the reasoning behind this approach, and in doing so echoed his comments from the ‘Science and Radio’ conference that May. “The average man today is bewildered by the present level of scientific achievement, or destructiveness,” he explained:

... because he has had little or no opportunity to form an understanding of the advances of the past two hundred years. This calls for a careful balance between disseminating information about recent advances (science as news) and presenting broad sweeps of the development of science.⁴¹

In Clow’s mind there was nothing wrong with developing a series that sought to describe the results of modern research, provided one also sought to describe something of the overall history of scientific and societal advance, and strove to give an indication of how the results of that modern research related to the long history of scientific advance. Where Cox had gone wrong, according to Clow, was in his assumption that listeners could understand one without the other.

Clow therefore proposed to supplement *Science Survey*’s existing focus on modern research with programmes that would convey important background information about the social context of science. Each programme would function as part of a larger whole, with each contributing one important piece to the puzzle that was science and its relationship to society. As such, Clow did not intend for the series to simply be a more grandiose version of his FEB programmes; he hoped to fashion something completely new. Rather than base a series around one piece of this puzzle isolated from the rest – e.g. *Science Survey* with its focus on modern scientific research or Clow’s FEB programmes with their focus on the social impact and material benefits of applied science – Clow proposed that each week *Science Survey* should introduce listeners to a different way of looking at and understanding science and its relationship to society.

Within this cumulative approach there are shades of the dual FEB series *Science and History* and *History and Science*, in that the programmes were intended to be experienced together, with each providing context for the other. There are also echoes of the Clows’ work on *The Chemical Revolution*, for early in that book the Clows write: “While each chapter is a unit in itself,

⁴¹ Clow, “Observations on Science Survey.”

the complete analysis of the industrial revolution set-up requires an integration of them all”.⁴² “[T]he effect in the end,” Clow assured management about his new series, “will be cumulative.”⁴³

To be sure, many of these various aspects of science were already covered by programmes on BBC radio – Clow’s FEB programmes examined the background of science; programmes on the Home Service often examined ‘science and society’ issues; talks on the Third Programme examined questions of science and its relationship to philosophy – but these were often short series or one-off programmes spread across three networks over seven days of near-continuous programming. Clow’s new version of *Science Survey*, by contrast, would examine all those aspects in one series, on the same network, at the same time each week. This continuity, Clow hoped, would give the average listener the opportunity to place each programme in its proper context and make sense of the larger whole.

Clow also stated that his new version of *Science Survey* would be much more entertaining than the previous incarnation. In keeping with the approach he had developed during his first year in the SEU, Clow argued that science programmes “should be sincere, informative, enlightening, but at the same time entertaining.”⁴⁴ He did not equate entertainment and popularity with inaccuracy and exaggeration. Rather, he felt science was inherently interesting and entertaining: “in the spirit of science,” Clow expanded, “the programmes should be lively, adventurous, and experimental.”⁴⁵ Producers of science programmes simply needed to exploit the natural entertainment value of science. Even so, he recognized the danger of placing too much emphasis on entertainment. Science programmes, Clow noted, should “interest the listener – not overawe him.”⁴⁶

Working to interest the listener was important, Clow suggested, because science programmes were broadcast into an increasingly hectic and bewildering world. Talks on protons and amoebas had to compete for attention against not only more entertaining radio programmes like radio dramas or quiz shows, but against other leisurely pursuits such as the cinema or the pleasures of a good book. “If the scientist of today is anything,” Clow wrote, “he is a citizen of a distracted world.”⁴⁷ An engaging style of presentation was therefore of paramount importance. As discussed in the previous chapter, during his time in the SEU Clow had utilized a wide range

⁴² Clow and Clow, *The Chemical Revolution*, 45.

⁴³ Clow, “Observations on Science Survey.”

⁴⁴ Clow, “Observations on Science Survey.”

⁴⁵ Clow, “Observations on Science Survey.”

⁴⁶ Clow, “Observations on Science Survey.”

⁴⁷ Clow, “Observations on Science Survey.”

of different presentation styles and had come to believe that straight talks from scientists were not always the best way to communicate important information to the British public. As a result, he concluded that *Science Survey* could no longer afford to pretend that what worked in a university lecture hall with a captive audience of scientifically-inclined students would work on radio.

Clow felt that during its first season there had been “nothing particularly outstanding” in the presentation of *Science Survey*, and as a result, the series had failed to attract a wide audience. On one side of the audience spectrum, the series had failed to attract listeners who lacked a solid foundation of scientific knowledge because they found the lecture-style talks difficult to follow. As Clow put it, they tended to find “unpresented science un-understandable.”⁴⁸ On the other side of the spectrum, listeners who knew some science – and who therefore stood a chance of making sense of the content of the talks – did not bother to tune in because there was nothing in the presentation of the programmes to make them “particularly interesting”.⁴⁹ Thus, Clow concluded:

As a means of telling one set of [scientists] what another set is doing it does not attract on account of presentation, and as a means of enlightening and entertaining [the average listener] it does not attract on account of content.⁵⁰

Clow saw proof of this in the audience research conducted by the BBC: “I think this is reflected in the listener research figure, which is low, coupled with a relatively high appreciation index.”⁵¹

This helps explain how Cox and Clow – two successful, and experienced producers – could hold such divergent views about the relative success of the series. In order to gauge the response of the listening audience, Cox, it would seem, looked to the appreciation index – a measure of how much the listening audience enjoyed the programme – whereas Clow looked to the listening figure – a measure of how many people actually tuned in. The problem that Clow alluded to was that since the listening figures were so low, the appreciation indexes had been taken from an extremely small and most likely scientifically pre-disposed section of the listening public; the ‘average listener’ or ‘man in the street’ whom Clow wanted to reach – and by whom Clow gauged the success of his own programmes – was not tuning in.

⁴⁸ Clow, “Observations on Science Survey.”

⁴⁹ Clow, “Observations on Science Survey.”

⁵⁰ Clow, “Observations on Science Survey.”

⁵¹ Clow, “Observations on Science Survey.”

Though one might question the wisdom of so strongly criticizing what was in many ways the flagship science programme for BBC radio during this period, Clow would seem to have had some support. Most straightforwardly, although the series had been commissioned by the Head of the Light Programme and was ostensibly designed to appeal to the Light Programme audience, the series was moved almost immediately to the more serious Home Service⁵² – a move that suggests management decided the series was far more demanding than expected.

Furthermore, when management enquired as to the possibility of re-broadcasting *Science Survey* talks on the Third Programme – the BBC’s most intellectually-dense network – Cox responded that it was “unlikely that Third Programme requirements should necessitate much change in our general policy with regard to subject matter.”⁵³ Though Cox was convinced that *Science Survey* had succeeded in its aims, he conceded that the series had “been ‘trying the audience pretty high’”.⁵⁴ Both he and Andrade were agreed, he noted, that “to go any more deeply into the subjects we’ve presented would be to limit the potential audience to people who are actually conversant with it already.”⁵⁵ “In other words”, he continued:

... if our talks on, say, physical scientific subjects were any more difficult they would cease to be acceptable to many professionals in the natural scientific field – let alone a lay audience.⁵⁶

Thus, the series that Norman Collins had commissioned with the intention of appealing to “an audience which for the most part knows absolute zero of scientific theory”,⁵⁷ had, in the event, been delivered at such a high level that it verged on being too difficult for even practicing scientists to follow.

Clow’s criticism of *Science Survey* would also seem to be supported by the BBC’s own radio critic, Martin Armstrong – known to readers of *The Listener* for his weekly column ‘The Spoken Word’. The week after *Science Survey* debuted, Armstrong had been filled with excitement and alerted his readers to what promised to be “a very important and interesting series”.⁵⁸ “By

⁵² By 18 June, just seven broadcasts into the start of the series, the decision had been made to move *Science Survey* to the Home Service. Norman Collins to A.D.T., “Science Survey,” Memorandum, (June 18, 1946), R51/533/1, Written Archives Centre.

⁵³ Ian Cox to D.T., “Science Survey,” November 1, 1946, R51/533/1, Written Archives Centre.

⁵⁴ Cox to D.T., “Science Survey.”

⁵⁵ Cox to D.T., “Science Survey.”

⁵⁶ Cox to D.T., “Science Survey.”

⁵⁷ Collins, “Science Magazine (Extract from Mr. Norman Collins’ Memo of 19th December 1945).”

⁵⁸ Martin Armstrong, “The Spoken Word,” *The Listener*, no. 904 (May 9, 1946): 624.

listening hard,” he told his readers, “I gleaned a great deal of astonishing and fascinating information”.⁵⁹ “For most of my life,” he confessed:

... I have tried, with indifferent success, to acquire at least a smattering of what is going on in the scientific world. It has been rather like trying to count the passengers on the ‘Royal Scot’ from the platform of a wayside station.⁶⁰

In *Science Survey*, Armstrong hoped he had finally secured “a seat in the guard’s van.”⁶¹

Nine episodes later, however, Armstrong was crestfallen. “Some time ago I welcomed Professor Andrade’s ‘Science Survey’ as a means whereby I might keep myself in touch with the trends of contemporary science”, he wrote in July 1946: “This laudable intention has been defeated not by Professor Andrade but by me.”⁶² Rather than place the blame for his inability to comprehend at the feet of Cox – as Clow would have done – Armstrong placed the blame on himself: “the lamentable truth”, he wrote, “is that I lack the necessary foundations.”⁶³ Armstrong noted that although he counted himself an educated man – he was, after all, a published novelist, poet, and literary critic – his inability to glean any information from the series had forced upon him the realization that:

... the golden days of the Renaissance, when an intelligent person might hope, by taking pains, to achieve at least a nodding acquaintance with all knowledge, are long since past. Even the merest smattering is far beyond the learned.⁶⁴

He shared Clow’s confidence that the series had likely “been of great value and interest to more scientifically minded people”, but for him, the value of the series seemed destined to remain “poetical rather than informative.”⁶⁵

Even if Armstrong was unwilling to blame his inability to follow the series on its planners, Clow had no such qualms. Clow claimed that the presentation of *Science Survey* had suffered because producers had failed to select speakers for their ability to produce a genuinely informative yet interesting talk. “Science Survey as it has been planned up to now”, he noted,

⁵⁹ Armstrong, “The Spoken Word,” May 9, 1946, 624.

⁶⁰ Armstrong, “The Spoken Word,” May 9, 1946, 624.

⁶¹ Armstrong, “The Spoken Word,” May 9, 1946, 624.

⁶² Martin Armstrong, “The Spoken Word,” *The Listener*, no. 913 (July 11, 1946): 60.

⁶³ Armstrong, “The Spoken Word,” July 11, 1946, 60.

⁶⁴ Armstrong, “The Spoken Word,” July 11, 1946, 60.

⁶⁵ Armstrong, “The Spoken Word,” July 11, 1946, 60.

“has given the impression of being a ‘prestige series’ for which broadcasters are selected primarily on account of their standing in the world of science.”⁶⁶ While Clow freely admitted that this might be “valuable in a way, e.g. in forming a link between broadcasting and science”, such a set-up was “open to certain objections” – chief among these being Clow’s belief that eminent scientists made terrible broadcasters.⁶⁷

Clow did not think *all* scientists were bad broadcasters. In fact, as has been seen, he had often utilized scientists in his FEB programmes during his first year in the SEU. His issue was with *eminent* scientists. Despite the confident assertions of Cox and Andrade that scientists were capable of speaking engagingly and delightfully about science, Clow felt that eminent scientists tended to “underestimate the care that is needed to present a well polished broadcast”.⁶⁸ As a result, programmes suffered whenever producers sought ‘big names’ rather than good broadcasters. He was convinced, therefore, that *Science Survey* would never appeal to the ‘man in the street’ as long as it continued to be planned as a ‘prestige series’.

First and foremost, Clow felt that eminent scientists failed to appreciate the subtle, yet important differences between a journal article and a radio script:

Such scientists, standing as they do at the head of their profession, are usually very busy men, and can ill or are unwilling to, spare the time to give the necessary thought to the presentation of their material in a medium other than a literary one.⁶⁹

Secondly, Clow felt they were unable – or, again, unwilling – to take the time to hone their abilities as broadcasters. “There is also the question of rehearsal”, wrote Clow:

It seems that broadcasters selected from a narrow stratum of their profession cannot give the time that I consider desirable, and have indeed insisted on in Forces Educational Broadcasts, to attend rehearsals.⁷⁰

Clow thus drew a distinction between reading a journal article into a microphone, and *broadcasting*. The former was easy, the latter was an art form that took time and effort to master.

⁶⁶ Clow, “Observations on Science Survey.”

⁶⁷ Clow, “Observations on Science Survey.”

⁶⁸ Clow, “Observations on Science Survey.”

⁶⁹ Clow, “Observations on Science Survey.”

⁷⁰ Clow, “Observations on Science Survey.”

Clow was more than willing to help scientists learn this art of broadcasting, but many, he lamented, seemed loath to make the effort.

Had Clow read through *The Listener* on 15 August 1946, he would have found a like-minded ally in Martin Armstrong yet again. Fresh off listening to an episode entitled ‘A Visit to Kew’,⁷¹ which he described as “simultaneously interesting and dull”, Armstrong paused to expound upon the makings of a good broadcaster:

... it is an incontrovertible fact that a good scientist, or for that matter a good anything-else, is not necessarily a good broadcaster. A few people are born broadcasters, the majority achieve the art only by practice, and the broadcast conversation of all that fall outside these two categories tends to be diffident and flat.⁷²

To be valuable – as more than just a link between broadcasting and science or as a means of telling one set of scientists what the other set were doing – *Science Survey* would need to begin prizing broadcasting ability over eminence; ‘good radio’ over prestige.

This was crucial for Clow since, quite simply, one could not educate listeners without first attracting them. “Scientists have a natural tendency to take themselves very seriously,” argued Clow early in the memorandum:

... and the widening gap between the forefront of scientific advance and the appreciation of developments on the part of the average person – a gap that is not without its serious consequences – places the BBC in a responsible position with regard to the dissemination of information about science.⁷³

The ‘widening gap’ of which Clow spoke was a reference to his belief that while in recent years science had developed myriad new methods of conquering nature for the benefit of mankind, the public were ignorant of the creative potential of science.⁷⁴ Furthermore, Clow’s reference to the ‘serious consequences’ of that gap was a reference to his belief that public ignorance of this potential could impede not only scientific progress, but societal progress as well. Clow therefore viewed the dissemination of important information about science as a service to the public – and as the *duty* of the BBC as a public service organization – since the sooner mankind learned to

⁷¹ “A Visit to Kew,” Radio Broadcast, *Science Survey* (BBC Home Service Basic, August 7, 1946).

⁷² Martin Armstrong, “The Spoken Word,” *The Listener*, no. 918 (August 15, 1946): 224.

⁷³ Clow, “Observations on Science Survey.”

⁷⁴ Later in the same memorandum on *Science Survey*, for instance, Clow had referred to the modern world as “a changing world in which scientific potential is increasing”. Clow, “Observations on Science Survey.”

support science, the sooner mankind would begin to reap the material and social benefits of science. Thus, for Clow, there was no contradiction involved in advocating that a public service organization like the BBC should work to promote science on scientists' behalf. What was good for science was good for society; a service to science was a service to mankind. Clow therefore encouraged the BBC to become a communicator of science in its own right and to work alongside scientists in pursuit of a common goal: the education of the British public about the importance and potentialities of science.

In Clow's mind, one way the BBC could lead this effort was by relaxing the moratorium on 'interpreters', no matter how forcefully scientists like Appleton and Andrade might protest. "[W]hile there are many [scientists] who are not radiogenic personalities," wrote Clow, "they possess, and are willing to make available, first-class material for broadcasting, provided that it is skilfully and sincerely handled by a competent publicist."⁷⁵ Clow did not advocate replacing scientists altogether – a programme on the results of a recent scientific study might still be delivered by a scientist directly involved in that study – but Clow was convinced there were aspects of science that could be covered best by a 'competent publicist' or an expert from another field. Clow himself, is a great example. Clow appeared in the 19 December 1945 broadcast of the FEB series *Science and History*, during which he inhabited the role of 'competent publicist' in order to detail "how chemistry helped to improve methods in the textile trade".⁷⁶ As a trained chemist, professional radio producer, practiced speaker on matters chemical, and co-author of *The Chemical Revolution*, Clow was decidedly more qualified to deliver a programme on the effect of science on industrial chemistry over the past two hundred years than, say, an academic chemist. It is not clear whether Clow envisioned his 'competent publicist' as a science writer/journalist like A.W. Haslett or as a professional broadcaster such as himself, but from the perspective of Appleton and Andrade the result would have been much the same since scientists themselves would no longer be in control of the delivery of such programmes.

4.3. 'a series of programmes not confined to two or three talks by experts'

Having exposed what he felt were serious problems with *Science Survey* and with science programming on BBC radio in general, Clow closed his memo by calling for a new science series:

⁷⁵ Clow, "Observations on Science Survey."

⁷⁶ "Science and History," *The Radio Times*, no. 1159 (December 14, 1945): 17.

These facts reinforce my belief that the time has come for putting on the air a series of programmes not confined to two or three talks by experts, but using all the resources at our disposal.⁷⁷

To give management a sense of what this series might look like, Clow attached a 13-week annotated outline of a new series developed with his approach to broadcasting in mind. Each programme would examine a different aspect of science and its relationship to society. Furthermore, each of these 13 programmes was envisioned as the first in a long line of talks on a similar topic – a ‘sub-series’, or ‘series within a series’. A talk on the centuries-long controversy surrounding spontaneous generation, for instance, was intended to be the first in a sub-series of programmes entitled, ‘Great Controversies’. Each new 13-week run of Clow’s new version of *Science Survey* would include another talk examining a great controversy in science. In Clow’s words, the outline served as “a prototype that could be repeated throughout the year.”⁷⁸

Of these 13 planned sub-series, three dealt with modern scientific research and the daily lives of scientists – *Science Survey*’s original focus – while the other ten examined historical-contextual aspects of science in an attempt to help listeners make sense of what Clow had called the ‘broad sweeps of the development of science’.⁷⁹ The ten historical-contextual programmes included: a programme on how to calculate the location of the North Pole from the air (‘Where is the North Pole?’) – a celebratory nod to the historic flight of the British aircraft ‘Aries’ over the magnetic and geographic north poles – imagined as the first in a series on topical scientific subjects;⁸⁰ the aforementioned programme about spontaneous generation (‘Spontaneous Generation’), designed to be the first in a series examining controversies within science;⁸¹ a programme about “the changes that will come about when radio-elements are freely available to hospitals” (‘Radium on the Shelf’), as part of a series on science and modern medicine;⁸² a programme on the migration patterns of birds (‘Different Ways of Looking at Birds’), an attempt to inject a little natural history into *Science Survey*;⁸³ a history of science series planned as celebrations of “the centenary of some scientific event or personality” (‘A Hundred Years

⁷⁷ Clow, “Observations on Science Survey.”

⁷⁸ Clow, “Observations on Science Survey.”

⁷⁹ The three programmes on modern scientific research consisted of two outside broadcasts from research laboratories (‘Scientists at Work’ and ‘King’s Cross to Edinburgh’), and a solo talk by Sir Robert Robinson detailing his research into plant pigments (‘Geraniums Red, Delphiniums Blue’).

⁸⁰ Clow, “Observations on Science Survey.”

⁸¹ Clow, “Observations on Science Survey.”

⁸² Clow, “Observations on Science Survey.”

⁸³ Clow, “Observations on Science Survey.”

Ago”;⁸⁴ a programme about the creation and production of D.D.T. (“This Had to Happen First”), as part of a series “tracing out the background to recent developments in applied science”;⁸⁵ a programme about biotechnology (‘Chemurgy’), imagined as the first in a series about the ways in which scientific developments were going to shape the future;⁸⁶ a programme about the scientific research that led, fortuitously, to the Thermos (‘The Thermos Flask’), intended to be the first in a series showcasing the scientific background to a number of modern household appliances;⁸⁷ a programme on “the changes that are needed to protect our food supplies in a changing world” (‘Food and the Law’), as part of a series examining the relationship between science and government;⁸⁸ and, finally, a scientific question and answer programme during which listeners would be able to hear “Impromptu answers to listeners’ questions [...] by a panel of experts” (‘Scientist’s Information Room’).⁸⁹

All told, the ten slots reserved for historical-contextual sub-series included: two slots for programmes about the past material and social benefits of science; two slots for programmes about potential future benefits of science; one slot for a programme on a topical subject; one for a programme about a great controversy within science; one for a programme on natural history; another for a programme on the history of science (increased to two slots in a later draft); one slot for a programme about a current ‘science and society’ topic; and one slot for a question and answer programme.

The proposed series not only expanded the content of *Science Survey* beyond modern research, but also expanded the style of presentation beyond “talks by experts”.⁹⁰ Clow’s initial 13-week outline included five discussions (three of them between scientists and non-scientists), four solo talks, and two outside broadcasts from research laboratories. There were also two programmes for which no style of presentation was listed (‘A Hundred Years Ago’ and ‘This Had to Happen First’), but later drafts suggest these were intended to be presented by a competent publicist in a style similar to Clow’s previous FEB programmes.⁹¹ Clow also proposed utilizing seven non-scientists among the 22 total speakers, including an Air Commodore, a legislator, and a clinician.

⁸⁴ Clow, “Observations on Science Survey.”

⁸⁵ Clow, “Observations on Science Survey.”

⁸⁶ Clow, “Observations on Science Survey.”

⁸⁷ Clow, “Observations on Science Survey.”

⁸⁸ Clow, “Observations on Science Survey.”

⁸⁹ Clow, “Observations on Science Survey.”

⁹⁰ Clow, “Observations on Science Survey.”

⁹¹ Archie Clow, “Science Survey for Spring Session 1947,” November 1946, R51/533/1, Written Archives Centre.

After weeks of research, Clow submitted his memorandum 'Observations on Science Survey and Suggestions for the Future' to Harman Grisewood, Director of Talks.

4.4. *The response from management*

The initial reaction to Clow's overhaul of *Science Survey* seems to have been mostly positive. "I find it interesting and, on the whole, acceptable", Grisewood wrote to R.A. Rendall, Controller (Talks), a week after Clow submitted his memorandum: "The examples of what he proposes I find quite attractive."⁹² Rendall responded three days later in much the same vein: "I agree with you that the [...] memorandum is interesting, and much of it very attractive."⁹³

However, both men were vehemently opposed to Clow's proposed style of presentation and in particular, the introduction of a 'competent publicist'. Their opposition returned once again to familiar arguments about the preferability of scientists over 'interpreters'. Just as Appleton felt "the man who knows most about a thing is generally the best one to explain it",⁹⁴ so too Grisewood preferred scientists for their first-hand knowledge and insight. A competent publicist, he argued in his memo to Rendall, could only "work up and present the material of the authorities at secondhand"; adding later, "I do not care for this approach as a means of popularising the broadcast."⁹⁵ In a possible reference to Clow's FEB series, *BBC Science Correspondent Reports*, Grisewood noted forcefully, "we ought to avoid the Scientific Correspondent type of thing altogether."⁹⁶ In his response to Grisewood, Rendall noted that the competent publicist might "have a place in the Light Programme" but even there, as he went on to explain, he would have preferred this 'competent publicist' to be "a so-to-speak 'practising' scientist, if possible."⁹⁷

Their rejection of the competent publicist approach was also rooted in a belief that, contrary to Clow's assertion, it was *not* the BBC's responsibility to communicate science to the public on behalf of scientists. Rather, it was the duty of the BBC, and of its producers in particular, to help scientists communicate *for themselves*. "The effort and ingenuity of production and presentation", argued Grisewood, "should go into making these people themselves be

⁹² Grisewood to Rendall, "Observations by Dr. Clow."

⁹³ R.A. Rendall to Harman Grisewood, "Observations by Dr. Clow on 'Science Survey,'" Memorandum, (October 17, 1946), R51/533/1, Written Archives Centre.

⁹⁴ May 3, 1946, 3.

⁹⁵ Grisewood to Rendall, "Observations by Dr. Clow."

⁹⁶ Grisewood to Rendall, "Observations by Dr. Clow."

⁹⁷ Rendall to Grisewood, "Observations by Dr. Clow."

interesting and simple rather than, accepting defeat, into finding ‘popularisers’ who would attractively display the work of others.”⁹⁸ Similarly, Rendall asserted that the BBC “must never give up the difficult task of persuading scientists themselves to shoulder the major responsibility of informing the public about scientific developments.”⁹⁹

They therefore showed more confidence in the ability of scientists to deliver informative yet engaging programmes than Clow had in his memo, as well as more faith in the ability of producers to help scientists achieve this goal. Indeed, the two men saw the adoption of a competent publicist as an admission of failure. Both understood that producers often faced a difficult challenge in trying to get scientists to speak at a level appropriate for the Light Programme and Home Service, but both reaffirmed the preference for scientists exhibited by Cox and Andrade during the planning of the original series. As Rendall wrote, “it would be a confession of failure to accept the idea that the scientist is inevitably too difficult to be followed by anything but the Third Programme audience.”¹⁰⁰ Clow’s role, as far as management were concerned, was helping scientists speak for themselves.

Whereas Grisewood and Rendall rejected only the presentation style of the proposed series, Godfrey Adams, Director of Programme Planning during the war, rejected the proposed subject matter. After being asked to comment on Clow’s proposed series, Adams went programme by programme through Clow’s second draft and wrote down his thoughts on each. Though he found fault with minor things like Sir Robert Robinson’s proposed talk on plant pigments – which he dismissed with a handwritten note that read, “Bit trivial”¹⁰¹ – what he most objected to were the historical-contextual programmes. He was “doubtful” about ‘Scientist’s Information Room’;¹⁰² “rather doubtful” about having “two whole programmes devoted to [...] centenaries”;¹⁰³ “doubtful”, that ‘Food and the Law’ would fit “happily into the scheme of the series”;¹⁰⁴ and, with regard to ‘Spontaneous Generation’, “doubtful whether [the BBC wanted] to introduce this kind of thing into the Science Survey series.”¹⁰⁵ In short, he was full of doubts.

⁹⁸ Grisewood to Rendall, “Observations by Dr. Clow.”

⁹⁹ Rendall to Grisewood, “Observations by Dr. Clow.”

¹⁰⁰ Rendall to Grisewood, “Observations by Dr. Clow.”

¹⁰¹ Handwritten note on Clow, “Science Survey for Spring Session 1947.”

¹⁰² Handwritten note on Clow, “Science Survey for Spring Session 1947.”

¹⁰³ Godfrey Adams to AC(I), “‘Science Survey’: Spring Session 1947,” November 28, 1946, R51/533/1, Written Archives Centre.

¹⁰⁴ Adams to AC(I), “‘Science Survey’: Spring Session 1947.”

¹⁰⁵ Adams to AC(I), “‘Science Survey’: Spring Session 1947.”

Adams's doubts stemmed not from concern over the viability of the programmes themselves, but from concern over their suitability within *Science Survey* – a series that had, after all, been designed to showcase modern scientific research. Thus, on his copy of Clow's second draft, Adams scribbled next to 'Food and the Law', "Change in the act or what? Not scientific enough".¹⁰⁶ In a 28 November 1946 memo he expressed similar sentiments about 'Spontaneous Generation', though he couched these in four layers of polite diffidence. "On the face of it", he wrote, "I am bound to say that, at the moment, I am enclined to think that this sort of thing would be best left to Features Department to handle outside 'Science Survey'".¹⁰⁷ For Adams, then, programmes about the relationship between science and government or about disputes between scientists had a place on the BBC, just not within *Science Survey* and probably not within the Talks department either. The Light Programme might broadcast a features programme about the effect of new legislation on various food industries, but *Science Survey* was designed to be about modern scientific research. Anything else would have to be jettisoned from the series.

Clow had therefore misjudged the extent to which he would be able to transport his historical-contextual approach from the SEU to *Science Survey*. What had worked for a forces broadcast clearly would not work within *Science Survey*. This may have surprised Clow considering how well his approach had fitted the SEU, but forces broadcasts were a unique form of broadcasting on BBC radio. The SEU was not only explicitly educational and tasked with broadcasting to a specialized audience, but many members of the unit were committed to prioritizing programmes about the benefits of applied science even before Clow had arrived. *Science Survey*, on the other hand, was a series about current scientific research intended for a general audience.

Adams's comments also shed light on the rejection of the competent publicist by Grisewood and Rendall. Just as Adams balked at the idea of introducing programmes about the political or social implications of science into a series designed to showcase modern scientific research, so too Grisewood and Rendall balked at the idea of introducing a competent publicist into a series designed to be delivered by scientists. As before, this is not to say that management felt the competent publicist had no place on the BBC – indeed, Clow had already employed a number of publicists, interpreters, science journalists, and science correspondents in his programmes for the forces. Rather, they felt the competent publicist had no place in *Science Survey*. The BBC's own promotional material, after all, had assured listeners: "it really is the men

¹⁰⁶ Handwritten note on Clow, "Science Survey for Spring Session 1947."

¹⁰⁷ Adams to AC(I), "'Science Survey': Spring Session 1947."

who know that you will hear.”¹⁰⁸ In fact, in the weeks before Cox and Collins agreed on ‘Science Survey’ as the title for the new series, it was known tentatively as both ‘Science Forum: the scientist himself speaks on his work’,¹⁰⁹ and, ‘Science Speaks for Itself’¹¹⁰ – two titles that foregrounded the role of scientists. Such a drastic change in presentation style might have been allowed in the SEU where experimentation was encouraged, but this was not the SEU. To indulge in a bit of counter-factual postulation: had Cox and Collins stuck with one of these titles, it might have highlighted for Clow just how far outside the original scheme he was stepping by attempting to introduce competent publicists. A series entitled ‘Science Speaks for Itself’, presented by, for example, the historian Asa Briggs, would have undoubtedly appeared a bit contradictory.¹¹¹ In the end, management fought hard to ensure that *Science Survey* remained what it had always been – a series about modern scientific research delivered by scientists themselves.

Though his memorandum was slowly being dismantled, from Clow’s point of view planning for the series went smoothly through October and November. Clow continued to expand upon his original 13-week proposal – submitting a second draft sometime in November – and there is nothing in the archival record to suggest that management expressed any concerns to Clow himself during this time. Come December, that changed. On 2 December 1946, Clow and Grisewood had a private meeting about the direction of the new series. No minutes or summary of the meeting exist, but from the few references to the meeting that survive in the archival record, Grisewood appears to have expressed his own concerns about the style of presentation, as well as Adams’s concerns about the subject matter.¹¹² Two days later, Clow submitted an incomplete and seemingly hurried third draft of the series which scrapped nearly all of the historical-contextual programmes from the first two drafts, and replaced them with talks of the standard type – i.e., lecture-style talks about modern research delivered by eminent scientists. It almost certainly would have been a difficult week for Clow.

¹⁰⁸ Unknown Author, “Science Survey (Following on Professor’ Andrade’s Article).”

¹⁰⁹ Ian Cox to Head of Light Programme, “Science Programme,” March 21, 1946, R51/533/1, Written Archives Centre.

¹¹⁰ Ian Cox to Head of Light Programme, “Science Programme,” March 22, 1946, R51/533/1, Written Archives Centre.

¹¹¹ Asa Briggs, author of over 4,000 pages on the history of the BBC, actually appeared in a 1945 Forces Educational Broadcast about the factors that helped Britain become “a great industrial power”. “Mills of Satan,” Radio Broadcast (Light Programme, September 5, 1945).

¹¹² It is not clear how much of Adams’s memo Grisewood conveyed to Clow in their 2 December conversation. However, by 7 December Grisewood was able to commend Clow for having “fallen in with the spirit” of Adams’s comments. Harman Grisewood to Archie Clow, “Science Survey,” December 7, 1946, R51/533/1, Written Archives Centre.

With the new series scheduled to start on New Year's Day, Clow spent December 1946 drafting a new series of talks along the lines laid out by management. Over those four weeks he was forced to cut or significantly alter each of his ten proposed historical-contextual programmes, save the centenary programme ('Alexander Graham Bell'). The last of the historical-contextual programmes to be cut was 'Scientist's Information Room'. Despite being made aware of Adams's doubts about the programme, Clow had attempted to make the case for its retention in a 17 December memo to Grisewood. Five days later Grisewood responded in a manner that perfectly encapsulates management's reaction to Clow's attempted overhaul. "I do not like the idea of [Scientist's Information Room]", he wrote: "I would prefer a straight Science Survey programme of the same type as the preceding material."¹¹³

All told, nine programmes from Clow's initial proposal were cut (including seven of the historical-contextual programmes) two were altered significantly but made it onto the air ('Radium on the Shelf' and 'Different Ways of Looking at Birds') while only two made it on air unaltered: 'Scientists at Work', and the historical-contextual programme 'Alexander Graham Bell'.¹¹⁴ Additionally, whereas Clow's original proposal called for five discussions and only four programmes comprised of solo talks, the programmes that were eventually broadcast included just one discussion and eleven programmes based on solo talks.¹¹⁵

Clow was able to alter two of his original programmes in order to get them on air. The nature of these changes casts further light on management's expectations for the series, and highlights the difficult task Clow would have faced in trying to fulfill these expectations while meeting his own goals for the series. Not surprisingly, Clow apparently faced pressure to alter the presentation style of a number of his programmes in order to fit the established scheme for the series. With regards to 'Radium on the Shelf', for instance, Clow's initial desire was to have "A physicist [...] and a clinician discuss the changes that will come about when radio-elements are freely available to hospitals", and to pair that discussion with an outside broadcast from a radio-chemical laboratory.¹¹⁶ By the time the programme aired, however, he had changed it to two individual talks by eminent research scientists – the first by the American physical chemist

¹¹³ Harman Grisewood to Archie Clow, "Science Survey: First Quarter 1947," December 23, 1946, R51/533/1, Written Archives Centre.

¹¹⁴ 'King's Cross to Edinburgh' was also cut from the first 13 programmes, but made it into *Science Survey* in May 1947 under the title, 'Railway Research'.

¹¹⁵ There were also two outside broadcasts in Clow's original proposal compared to one as broadcast.

¹¹⁶ Clow, "Observations on Science Survey."

Harold C. Urey on “the use of isotopes as tracers”, the second by the British physicist J.D. Cockcroft on the making of “the new radio-elements”.¹¹⁷

Although the broadcast version covered much the same terrain as the original proposed version, in Clow’s eyes the reversion back to straight talks would have severely limited the programme’s ability to connect with listeners. Clow’s original version was not only designed as a *discussion* rather than as solo talks, but as a discussion between a research scientist, a profession with which the average listener likely would have had little contact, and a clinician, a profession with which the average listener likely would have had at least some contact. The clinician was therefore someone who might have helped bridge the gap between the listener and the research physicist. By altering the presentation style of the programme to solo talks by two eminent scientists Clow was able to fit the programme within the established scheme for the series, but at the expense of helping listeners better understand the important information being conveyed.

Clow also apparently faced pressure to develop programmes that exhibited a more professional and respectable air. Altering a programme to meet this requirement, however, could be as simple as altering the language used to describe it. After his 2 December 1946 meeting with Grisewood, for instance, Clow changed the title of ‘Radium on the Shelf’ to the more professional, ‘Making and Using Radio-Elements’. The most drastic of these titular changes affected ‘Different Ways of Looking at Birds’. Pitched as two solo talks on recent scientific research, the programme would have been well within the original scheme for *Science Survey*, had it dealt with a more traditional field of science such as chemistry or physics rather than ornithology. Cox had imagined *Science Survey* as a survey of the ‘hard sciences’ – primarily physics, chemistry, biology, and applied science or engineering¹¹⁸ – and had therefore never broadcast a talk on natural history, despite it being, in Clow’s words, “a popular aspect of science”.¹¹⁹ To distinguish the programme from common bird-watching programmes and lend it a more respectable appearance, Clow recast the two talks in language more befitting the professional aspirations of the series: the title of James Fisher’s talk, ‘Different Ways of Looking at Birds’ was transformed into ‘The Dynamic and Static Aspects of Ornithology’, and the title of Arthur Landsborough Thomson’s talk was changed from “the eternally fascinating subject ‘Bird Migrations’” to ‘The Hormone Stimulus to Migration’.¹²⁰ The contents of the talks themselves

¹¹⁷ “Science Survey,” *The Radio Times*, no. 1222 (March 14, 1947): 18.

¹¹⁸ Anonymous (but most likely Ian Cox), “Science - Weekly Half Hour Programme.”

¹¹⁹ Clow, “Observations on Science Survey.”

¹²⁰ Archie Clow to Harman Grisewood, ““Science Survey”: First Quarter 1947,” December 17, 1946, R51/533/1, Written Archives Centre.

appear to have remained unchanged and therefore would have potentially still interested those listeners who regularly tuned in to talks on natural history and ornithology. It is doubtful, however, whether listeners skimming the *Radio Times* would have recognized the talks as such unless they were at least marginally conversant in ornithological jargon.

By the time the *Radio Times* advertised the talks in January 1947, the title of the programme as a whole had been changed yet again to the more straightforward, ‘Bird Populations’, and the title of Thomson’s talk had been changed to the slightly less pedantic ‘The Stimulus to Migration’.¹²¹ It is possible, therefore, that Clow was having a bit of fun within his new boundaries by inserting a few comically obscure titles. Even so, the drastic shift in language after Clow’s meeting with Grisewood suggests that Grisewood directed Clow to develop programmes that were more professional and austere than those that Clow had proposed in his memorandum. It also once again reveals the difficulty Clow would have faced in attempting to balance management’s expectations with his own. Even these seemingly minor alterations to the language used to describe the talks would have almost certainly limited the appeal and potential audience of the programme.

Though Clow would undoubtedly have been disappointed at having to dismantle his proposed series and return *Science Survey* to the status quo, to a certain extent he brought this disappointment on himself. Management asked him for his views about the future of *Science Survey*, yet instead of working within the existing scheme for that established series, he offered up an outline for an entirely new series that departed from the established scheme for *Science Survey* in both content and presentation. What is more, Clow was attempting to refashion the very organizing philosophy of the series by replacing its focus on discoveries and advances within science, with a focus on the ways science was affecting people’s lives and philosophical outlook – something of which Cox had always been wary. In fact, Cox and Andrade had worked to ensure that the series avoided any connection with the type of Hogben-esque, functionalist approach that Clow was attempting to inject into the series. Before deciding on the decidedly pedestrian title, ‘Science Survey’, Collins, Cox and Andrade had considered more provocative titles such as ‘Things to Come’, ‘The Future’s Here’, ‘Journey into the Unknown’, ‘Brave New World’, and, Collins’ personal favorite, ‘Science for the Million’.¹²² However, after Collins wrote

¹²¹ “Science Survey,” *The Radio Times*, no. 1216 (January 17, 1947): 18.

¹²² Ian Cox to Norman Collins, “Norman: Some Ideas + Associations,” February 1946, R51/533/1, Written Archives Centre.

to Cox on 19 March 1946 to inform that he would “much prefer” to call the series ‘Science for the Million’;¹²³ Cox responded on Andrade’s behalf:

Andrade feels that, among other things, the proposed title is too close to that of Hogben’s book [‘Mathematics for the Million’] and would carry with it a number of associations that he feels are undesirable in this connection.¹²⁴

Seen in this light, the reaction of management is perhaps a bit more understandable. They asked Clow for his thoughts on the future of an established series, and instead received a pitch for something wholly and completely different – something that ran contrary to the philosophy upon which the series had been built. From their perspective, Adams and Grisewood were not gutting Clow’s proposed series, they were ensuring that *Science Survey* remained what it had always been.

In Clow’s mind, however, the series was a failure and was in desperate need of an overhaul. In fact, Clow was openly critical of the way *Science Survey* had been run under Cox, and regularly hinted that there were other BBC staff who were just as critical of the series. “Direct criticisms that have been made to me during the past few months I shall not deal with”, Clow wrote coyly in his memorandum.¹²⁵ It is possible, then, that Clow hoped management were similarly critical of *Science Survey* and would be willing to scrap the series – especially since Cox, the original developer and sole producer of the series, was leaving the BBC. What Clow misjudged was the degree to which management were committed to preserving *Science Survey* in its original form. Where Clow saw a failure, management apparently saw a success. Clearly, management had a different standard against which they judged success or failure.

A 7 December memo from Grisewood to Clow shines light on this standard of success. After alluding to their 2 December meeting, Grisewood laid out in three bullet points management’s goals for *Science Survey*. “As I told you in conversation”, Grisewood wrote, “important requirements for us will be:

- the maintenance of good relations with the Science world generally, and particularly with leading men;
- the speakers should be first rate authorities on their subjects;

¹²³ Norman Collins to Ian Cox, “Science Programme,” March 19, 1946, R51/533/1, Written Archives Centre.

¹²⁴ Cox to Head of Light Programme, “Science Programme,” March 21, 1946.

¹²⁵ Clow, “Observations on Science Survey.”

- whatever we do, we should aim at maintaining and improving our reputation for good judgment among the Science world [...].¹²⁶

“Our broadcasts should bring us credit,” he continued, “and this consideration is more important even than attractiveness in voice and manner”.¹²⁷ This was a recapitulation of sentiments Grisewood had expressed to Rendall seven weeks prior. “Don’t you think,” he had written then, “the balance of advantage lies in our continuing to deserve the reputation for using directly, even if they do sound rather stuffy, only the very best authorities.”¹²⁸

Thus, for management, the goal of *Science Survey* was the improvement of the BBC’s reputation, not with the listening public, but with the ‘Science world’ with a capital ‘S’ – and it was against this standard that they judged the success of the series. When Grisewood wrote, ‘Our broadcasts should bring us credit’, he meant credit that would issue forth from the world of science. In a very real sense, then, as far as management were concerned, the intended audience for *Science Survey* was not the listening public as a whole, but a very small segment of that public – namely, scientists. By broadcasting ‘first rate authorities’, the BBC could publicly demonstrate its commitment to science and science broadcasting, and thus improve its reputation with any scientists listening in.

Ultimately, courting favor from scientists was a way for the BBC to stake its claim to a position among Britain’s elite cultural institutions. In 1942, for example, the BBC had approached the Royal Society in the hope that the august body of scientists would agree to serve as the BBC’s advisors on scientific matters. As Jones writes, in seeking to establish a relationship with the Royal Society, the BBC was “implicitly acknowledging the appropriateness of the established institution collaborating with [the] 20-year-old broadcasting organisation.”¹²⁹ “It was a gesture”, he continues, “that simultaneously honoured the Society and claimed status for the BBC as a part of Britain’s cultural establishment.”¹³⁰

Science Survey functioned in much the same way, and can be seen as an attempt by the BBC to burnish its establishment credentials. Throughout the planning of the series, in fact, Cox and the BBC courted the Royal Society’s favor and cooperation. During the first month of planning, for instance, Cox took time to “collect ideas” from the Royal Society, “whose

¹²⁶ Grisewood to Clow, “Science Survey.”

¹²⁷ Grisewood to Clow, “Science Survey.”

¹²⁸ Grisewood to Rendall, “Observations by Dr. Clow.”

¹²⁹ Jones, “Speaking of Science,” 141.

¹³⁰ Jones, “Speaking of Science,” 141.

blessing”, he wrote, “seemed essential”.¹³¹ A few days later, G.R. Barnes, Assistant Controller (Talks), requested that the series be placed on a day other than Thursday since “the selection of this day might hamper selection of speakers connected with [the] Royal Society.”¹³² As it happened, sixty-five percent (55 of 84) of the talks broadcast under Cox were delivered by Fellows of the Royal Society.¹³³ Further, when Clow proposed proceeding without an editor or host, Cox wrote to Grisewood to caution him against this course of action:

The use of Andrade (or someone of similar standing) as the permanent ‘host’ in ‘Science Survey’ is of far greater advantage to us than appears on the surface. If he (or a successor of F.R.S. status) is not employed in future ‘Science Surveys’ I fear the very high regard in which the programme is held in scientific circles may fall [...].¹³⁴

Andrade was valuable not so much for his abilities as a presenter, it seems, but for his ‘standing’ or ‘F.R.S. status’, and for the effect that his presence had in recommending the series to the scientific world.

Despite Clow’s commitment to overhauling the series, he would have agreed with many of management’s goals for *Science Survey* going forward – at least to a degree. In fact, within his memorandum, Clow not only argued that the BBC should “try and improve its standing as a disseminator of scientific information with the body of scientists at large”, but assured management that his proposed series would be carried out “in an atmosphere of sympathetic cooperation from scientists themselves.”¹³⁵ Further, though he eventually secured Andrade’s dismissal, Clow admitted that “having a ‘name’” attached to the series did indeed “give a standing to the broadcast”.¹³⁶

The major difference between Clow’s new approach and the established approach, however, was that Clow felt he could improve the BBC’s relations and reputation with the scientific world without using eminent scientists as speakers. Indeed, his historical-contextual approach required speakers who could be informative yet engaging – something of which Clow was convinced eminent scientists were incapable. In Clow’s mind, his new series would impress scientists, not with the status of its speakers, but by the quality and impact of its broadcasts.

¹³¹ Cox to Head of Light Programme, “Science Period - 30 Minutes Weekly.”

¹³² Handwritten note on Cox to Head of Light Programme, “Science Period - 30 Minutes Weekly.”

¹³³ For comparison, in Clow’s first two series, 24 of 106 (22.6%) talks were delivered by Fellows of the Royal Society.

¹³⁴ Cox to D.T., “Science Survey.”

¹³⁵ Clow, “Observations on Science Survey.”

¹³⁶ Clow, “Observations on Science Survey.”

Scientists, he assured management, would recognize and appreciate “the good that can be done by spreading scientific truth, and making non-scientists familiar with the struggles and shortcomings, as well as with the achievements, of science.”¹³⁷ Furthermore, no matter how much Clow hoped to improve the standing of the BBC, that goal was always secondary to his primary goal: the education of the public about themselves, their surroundings, and the effect of science on the modern world.¹³⁸

4.5. *Institutional priorities*

The fundamental disagreement, then, was over the ultimate purpose of *Science Survey*. Whereas Clow saw the education of the public about science as the ultimate purpose of *Science Survey* and therefore valued speakers who could deliver informative yet engaging programmes, management primarily saw *Science Survey* as a means of improving its reputation, and therefore valued speakers from prestigious universities, laboratories, or organizations regardless of their ability (or inability) to put out an engaging broadcast.

The competent publicists and non-scientists in Clow’s proposed series might have been able to deliver more engaging and informative radio, and in certain cases might have even been able to speak more authoritatively than an eminent scientist – in, say, a history of science programme – but authority and ‘good radio’ were not what management valued most. Rather, they valued prestige. An unheard of clinician, legislator, or competent publicist could not deliver it; an eminent scientist could, and this more than made up for the fact that, as Grisewood had admitted to Rendall, “they do sound rather stuffy”.¹³⁹

Courting favor with the world of science and burnishing its establishment credentials therefore not only took priority over the education of the public about science, but over ‘good radio’ as well. The inescapable conclusion, then, is that despite priding itself on being a public service broadcaster, *Science Survey* was more about serving the interests and ambitions of the BBC than it was about serving the public.

¹³⁷ Clow, “Observations on Science Survey.”

¹³⁸ Clow, “Observations on Science Survey.”

¹³⁹ Grisewood to Rendall, “Observations by Dr. Clow.”

Clow, it turns out, was quite correct when he characterized Cox's version of *Science Survey* as a "prestige series" valuable mainly "in forming a link between broadcasting and science".¹⁴⁰ What he clearly had not realized was that for management, the preservation of this link took priority over any other goals Clow might have had for the series or for science broadcasting in general going forward. Thus, while it is true that science producers at the BBC generally enjoyed a good deal of freedom when determining the type and style of science programming they wished to produce (see Chapter 4.1), it is also true that in certain cases producers were required to enact and abide by policy decisions handed down from management.

Clow also appears not to have realized just how committed management were to utilizing scientists in the delivery of science broadcasts rather than 'interpreters' – or 'competent publicists' as Clow had called them. When *Science Survey* launched in 1946 the BBC's own promotional material indicated that regardless of how science programmes had been presented on BBC radio before the war, the post-war period belonged to the scientist. Indeed, in Rendall's mind the BBC's commitment to "scientists themselves" rather than interpreters went beyond *Science Survey* and extended not only to the Third Programme and Home Service but ideally to the Light Programme as well.¹⁴¹ This approach to science broadcasting would hold sway within the BBC's Talks department for the better part of the next two decades.

On New Year's Day 1947 *Science Survey* broadcast a talk by the astronomer Sir Harold Spencer Jones and passed from the Ian Cox era to the Archie Clow era.¹⁴² Jones' talk that day was the first of more than 700 talks broadcast within *Science Survey* over the next two decades. However, in the same way that the first day of January looks and feels much the same as the last day of December, it is doubtful whether many listeners that day would have been able to distinguish much difference between Clow's new version of *Science Survey* and the version that had come before. The series continued to function primarily as a prestige series and carried a long line of lecture-style talks on modern scientific research. Though Clow would eventually tweak the series to better fit his vision, most of the more recognizable changes would come in later years (see Chapter 6).

¹⁴⁰ Clow, "Observations on Science Survey."

¹⁴¹ Rendall to Grisewood, "Observations by Dr. Clow."

¹⁴² Sir Harold Spencer Jones, "The New Year," Radio Broadcast, *Science Survey* (BBC Home Service Basic, January 1, 1947).

Chapter 5:

Science for Elite Audiences

Nine days after Clow submitted his memorandum on the future of *Science Survey*, he was once again asked to submit ideas for science programming on BBC radio, this time for both the Light Programme and the BBC's newest – and most intellectually ambitious network – the Third Programme.¹ Nothing appears to have come of Clow's Light Programme suggestions, but he would go on to develop numerous programmes for the Third. If Clow's experiences with *Science Survey* show him having to rein in the creativity afforded him in the SEU in deference to wider BBC priorities, his experiences with the Third Programme saw him ceding even more control over programme-making.

Coming at around the same time as his planning for both *Science Survey* and *Science & Everyday Life*, the request for input into the Light and Third means that during the winter of 1946-47 Clow was given the opportunity to shape the style and approach of science broadcasting for all three of the BBC's domestic networks. One reason for the convergence of these requests is that in the early post-war period the BBC underwent a major reorganization. As discussed in the introductory chapter, soon after the end of the war BBC radio rearranged itself into a tri-part pyramid consisting of the Light Programme (lighter, more popular fare), Home Service (described as “carefully balanced, appealing to all classes, paying attention to culture at a level which the ordinary listener can appreciate”²), and Third Programme (described as programming “of the highest possible cultural level”³). Haley used the example of Richard Strauss' comic opera, *Der Rosenkavalier*, to outline his hope that listeners who enjoyed a Light Programme broadcast of the opera's waltzes might seek out similar, though slightly weightier, operatic fare on the Home Service. Upon developing an appreciation for Home Service broadcasts of Strauss's arias, they might seek out still weightier musical offerings on the Third Programme,

¹ For details of Clow's Light Programme and Third Programme suggestions, see WAC R51/523/5.

² “Memorandum by the Director-General,” Memorandum, (February 14, 1944). Cited in Briggs, *Sound and Vision*, 4:58.

³ “Programme Development,” BBC Internal Memorandum, (February 14, 1944), Written Archives Centre. Cited in Curran and Seaton, *Power Without Responsibility*, 152.

eventually developing the musical sensibilities to enjoy *Der Rosenkavalier* in its entirety.⁴ With regards to science, the question became: if programmes on the Third were meant to occupy the uppermost level of a cultural pyramid, what was the scientific analogue of a nearly four hour German-language opera? In other words, what type of science programme could sit comfortably between a performance of Mozart's *Die Zauberflöte* and a reading of Milton's 'Samson Agonistes'.

The answer upon which the Third settled during its first decade of existence left Clow with much less autonomy and control over science programming on the Third compared to programming on the Light or even the Home. As a result, Clow appears much less frequently in the debates and deliberations of the Third Programme. Despite this, examining science programming on the Third is necessary in order to understand the relationship between the BBC's three networks and the science programming Clow produced for each.

5.1. Defining science on the Third

Though the first controller of the Third Programme, George Barnes, made no mention of science in his remit for the new service,⁵ there is evidence that from early on management were committed to including science as part of the standard programming of the new service. Indeed, on 16 October 1946 – just two and a half weeks after the launch of the service – Harman Grisewood informed Clow that he would “like very soon to make offers to Third Programme [...] of Scientific Talks”, and asked Clow to consider the question of science on the Third.⁶ By 21 November, Clow had submitted his initial proposals, and management had committed the new service to fortnightly science broadcasts starting in January of the coming year.⁷

One of the greatest factors in shaping the type of science programming deemed suitable for the Third Programme was management's conception of the type of listener that the new service would attract. Within Haley's tri-part pyramid, the audience for the Third Programme was envisioned as “one already aware of artistic experience”, and one that would include

⁴ Briggs, *Sound and Vision*, 4:70.

⁵ Jones, “Speaking of Science,” 182. Jones writes that Barnes’ “background was in the humanities, and his personal notes on the aims of the Third omit any reference to science”.

⁶ Harman Grisewood to Archie Clow, “Science Talks: Third and Light Programmes,” Memorandum, (October 16, 1946), R51/523/5, Written Archives Centre.

⁷ “Suggestions Pending with D.T. (Discussed 21st November),” November 22, 1946, R51/590/1, Written Archives Centre.

“persons of taste, of intelligence and of education.”⁸ Listeners to science talks were therefore envisioned as intelligent professionals with perhaps a faintly remembered background of scientific knowledge from their grammar school days. From early on management decided that the best way to meet the desires and expectation of this specialized audience was by broadcasting probing and analytical scientific programmes.

In March 1947, for instance, Clow and Grisewood met to discuss plans for science on the Third Programme. No transcript of the meeting exists, but according to a later memo from Grisewood, the two men discussed what was “in Barnes’ mind regarding Science talks”.⁹ In his memo, Grisewood reiterated Barnes’ desire for talks of a more analytical and less didactic nature, and in particular Barnes’ interest in “biological studies and their relation with philosophy and the human situation as we know it.”¹⁰ Grisewood admitted, however, that this type of programme would be difficult to mount since it would require identifying and recruiting a scientist with “a mind that has thought pretty deeply about the subject in addition to the qualities of practical experience.”¹¹ Thus, while many scientists might be capable of delivering an expository lecture on the fundamentals of a new discovery, it would take a keener, more probing mind to analyze the philosophical significance of that discovery and its potential impact on ‘the human situation’ or other intellectual pursuits. The former had long had a place on the Home Service, but Barnes hoped to make the Third Programme the place for the latter.

Looking back on the launch of the Third Programme in a commemorative broadcast for the fifth anniversary of the service, Harman Grisewood – by that point the new Controller of the Third Programme – explained that the goal of the Third was to break down barriers between listeners. Grisewood noted that the service was motivated in part by the historian G.M. Young’s fear that a failure to communicate might lead to the end of civilization.¹² “The scientist”, Grisewood explained in his talk, “might not be understood by the philosopher, the poet by the

⁸ “Programme C Terms of Reference,” Memorandum, (January 16, 1946), R34/602, Written Archives Centre. Cited in Humphrey Carpenter, *The Envy of the World: Fifty Years of the BBC Third Programme and Radio 3, 1946-1996* (London: Weidenfeld & Nicolson, 1996), 11–12.

⁹ Harman Grisewood to Archie Clow, “Science Talks for Third Programme,” Memorandum, (March 19, 1947), R51/523/6, Written Archives Centre.

¹⁰ Grisewood to Clow, “Science Talks for Third Programme.”

¹¹ Grisewood to Clow, “Science Talks for Third Programme.”

¹² Harman Grisewood, “The Place of the Third Programme,” *The Listener*, no. 1179 (1951): 542.

historian, the politician by the poet, the artist by the priest.”¹³ The Third Programme’s unique contribution to society was that it strove to stem this tide of fragmentation:

Here, I think is the distinctive role of the Third Programme – its *place* in our community. It encourages, it promotes, an element of intercommunication, of exchange, in a society where specialisation tends to cut off from one another those who specialise, so that one branch of activity may not recognise the significance of what another is doing.¹⁴

Thus, science programmes on the Third were not solely about science, but about how science related to and interacted with these other pursuits. Whereas *Science Survey* was advertised in the *Radio Times* as a “weekly programme about work in the world of science”,¹⁵ the science programmes broadcast by the Third Programme were meant to examine the relation of this work to other intellectual pursuits.

5.2. *A decade of science on the Third*

Over the first decade of its existence, the Third Programme carried talks that sought to examine the relation of the scientist’s work to the work of each of the other professionals mentioned by Grisewood in the above quote – i.e. the philosopher, priest, historian, politician, poet, and artist. Talks on science and its relationship to philosophy made up a large portion of the science talks broadcast by the Third Programme during its first years on the air, and to a large extent came to define science talks on the Third.¹⁶ In fact, not long after his meeting with Grisewood in March 1947, Clow had indeed come to view the Third Programme as the network where he would thenceforth seek to place high-level discussions of science and philosophy. In response to a suggestion for a Home Service discussion of Arthur Eddington’s ‘Philosophy of Physical Science’, for instance, Clow informed management: “The philosophy of physical science is difficult [...] but it is the thing I have been thinking about for the 3rd.”¹⁷ Over the first decade of its existence, the Third broadcast a number of talks on science and philosophy broadly defined, such as: ‘How Modern Science Has Contributed to Philosophy’ by the mathematician

¹³ Grisewood, “The Place of the Third Programme,” 542.

¹⁴ Grisewood, “The Place of the Third Programme,” 542. Original emphasis.

¹⁵ “Science Survey,” *The Radio Times*, no. 1214 (January 3, 1947): 18.

¹⁶ See Jones, “Speaking of Science,” 180–85.

¹⁷ Archie Clow to Mr. Curran, “Attached Letter,” Memorandum, (May 21, 1947), R51/523/6, Written Archives Centre.

Sir Edmund Whittaker,¹⁸ and ‘Neither Believer Nor Infidel’ by the novelist and naturalist E. L. Grant Watson,¹⁹ during which Watson used Sir Charles Sherrington’s book ‘Man on his Nature’ as “an example of the philosophical interpretation of science”, and discussed “the influence of science on modern thought.”²⁰

Further, the Third Programme broadcast a number of talks on the relationship between science and religion, such as the simply but aptly titled, ‘Religion and Science’, by Professor C. E. Raven in 1946,²¹ and ‘Natural Science and the Spiritual Life’ by Professor John Baillie in 1952.²² The *Radio Times* advertised the latter by noting that Baillie was to treat:

... the relation of science to religion as a principle that arises not so much between two men – the man of science and the man of faith – but as the problem that emerges when the man of science and the man of faith are the same man and the two entities to be related are elements in a single mind.²³

The Third Programme also broadcast a series of seven intriguing discussions under the title, *The Epiphany Philosophers*, which the *Radio Times* described as discussions between:

... a group of philosophers and scientists, members of the Church of England, who investigate the matter of religious thought and practice with methods provided by contemporary science and philosophy.²⁴

The Epiphany Philosophers discussed such topics as, ‘Can a Scientist be a Christian?’, ‘A Scientist Looks at the Church’, and ‘A Scientist Looks at Penitence’.²⁵

In addition to these talks on science and religion, the Third Programme carried talks that explored the realm of metaphysics. In July 1947, for instance, the philosopher Stuart Hampshire spoke on, “the metaphysical implications of scientific method” (‘The Limits of Metaphysics’).²⁶

¹⁸ Edmund Whittaker, “How Modern Science Has Contributed to Philosophy,” Radio Broadcast (Third Programme, September 8, 1948).

¹⁹ E.L. Grant Watson, “Neither Believer nor Infidel,” Radio Broadcast (Third Programme, April 27, 1947).

²⁰ “Neither Believer nor Infidel,” *The Radio Times*, no. 1228 (April 25, 1947): 9.

²¹ C.E. Raven, “Religion and Science,” Radio Broadcast (Third Programme, December 15, 1946).

²² John Baillie, “Natural Science and the Spiritual Life,” Radio Broadcast (Third Programme, January 20, 1952).

²³ “Natural Science and the Spiritual Life,” *The Radio Times*, no. 1471 (January 18, 1952): 15.

²⁴ “Epiphany Philosophers - What Is the Use of Metaphysics?,” *The Radio Times*, no. 1740 (March 15, 1957): 35.

²⁵ “Can a Scientist Be a Christian?,” Radio Broadcast, *The Epiphany Philosophers* (Third Programme, March 19, 1952);

“A Scientist Looks at the Church,” Radio Broadcast, *The Epiphany Philosophers* (Third Programme, August 16, 1952);

“A Scientist Looks at Penitence,” Radio Broadcast, *The Epiphany Philosophers* (Third Programme, March 10, 1954).

²⁶ “The Limits of Metaphysics,” *The Radio Times*, no. 1240 (July 18, 1947): 4.

In May 1950, J.B. Rhine, Director of the Parapsychology Laboratory of Duke University, examined “whether spontaneous psychic experiences can play any significant role in scientific research” (“What Can Science do with Psychic Experience?”).²⁷ Later that month Sir Edmund Whittaker responded to Fred Hoyle’s five-part series, “The Nature of the Universe”²⁸ – also delivered on the Third Programme – and discussed “some implications of the new knowledge that are significant for philosophy and religion as well as for physics” (“The New Cosmology”).²⁹

Beyond these more philosophical talks, the Third Programme broadcast a number of Barnes’ other preferred type of science talk: talks that examined science and its relation to ‘the human situation as we know it’. In the fall of 1948, for instance, C.D. Darlington delivered a two-part series entitled *The Conflict of Science and Society*. The *Radio Times* noted that Darlington would spend the first talk arguing that scientific discovery “necessarily tends to undermine the spiritual, intellectual, and material foundations of society; and that established authorities therefore tend in self-defence to suppress or ignore the findings of research”.³⁰ The *Radio Times* further explained that Darlington would spend the second of his talks arguing that “the acceptance and application of scientific research and discovery can help our society to adjust itself to rapidly changing conditions – an adjustment on which the survival of our nation and of our culture may depend.”³¹ Two years later, the ecologist Frank Fraser Darling spoke about the ways in which “civilized man” has upset the balance of nature in his quest for resources, and in doing so has created “problems of his own existence which he has not yet solved” (“The Ecological Climax”).³²

Within these ‘science and society’ talks, the Third Programme broadcast a number of talks on science and its relation to politics, and to the national – and international – economy. The former included ‘Science and Democracy’ by Bertrand Russell in January 1947,³³ and ‘Science or Moralism in Diplomacy’ by the historian Herbert Butterfield in the spring of 1951,³⁴ the latter included *Research for Plenty*, an eight-part series broadcast in the summer of 1952 that sought to demonstrate “the part science can play in increasing man’s scope for food

²⁷ “What Can Science Do with Psychic Experience?,” *The Radio Times*, no. 1387 (May 12, 1950): 39.

²⁸ For more on Hoyle’s series, see Jane Gregory, *Fred Hoyle’s Universe* (Oxford: Oxford University Press, 2005).

²⁹ “The New Cosmology,” *The Radio Times*, no. 1388 (May 19, 1950): 37.

³⁰ “The Conflict of Science and Society,” *The Radio Times*, no. 1305 (October 15, 1948): 15.

³¹ “The Conflict of Science and Society,” 19.

³² “The Ecological Climax,” *The Radio Times*, no. 1390 (June 2, 1950): 23.

³³ Bertrand Russell, “Science and Democracy,” Radio Broadcast (Third Programme, January 5, 1947).

³⁴ Herbert Butterfield, “Science or Moralism in Diplomacy,” Radio Broadcast (Third Programme, May 20, 1951).

production.”³⁵ The Third Programme even occasionally turned its critical gaze towards science, for alongside talks that examined how to most effectively utilize science within society, the network also carried a number of talks that examined how to most effectively coordinate science itself. In the fall of 1948, for instance, the Third Programme invited J.D. Bernal and Michael Polanyi to trade their views in a programme entitled, ‘The Organisation of Science and Scientists’.³⁶

Finally, the Third even broadcast talks on science and its relationship to art and aesthetics such as: ‘Science and the Arts: Have They Any Common Ground?’ in 1946;³⁷ ‘Poetry and Science’ by the poet J. Isaacs in 1949;³⁸ and ‘Science and the Singer: The Musical Approach’ by the singer and vocal coach Franklyn Kelsey in 1954, during which Kelsey argued that the scientific approach was “to a considerable extent responsible for the decline in the art of singing”.³⁹

This emphasis on programmes that examined the impact of science on other intellectual or professional pursuits did not, however, lead to a prohibition on talks about new developments in science. Indeed, after informing Clow in 1947 that Barnes was interested in talks on the philosophical and societal implications of science, Grisewood assured Clow that talks on new developments in science would have a place on the Third Programme as well. “In seeking for talks of this sort”, Grisewood wrote to Clow in his March 1947 memo, “I am sure Barnes does not mean to exclude good talks by experts in various fields e.g. Tizard, Cockcroft, Blackett, Dale, Hartley etc.”⁴⁰ In the years that followed, Third Programme listeners were not only treated to talks on modern developments by all of the above – save Hartley – they were also presented with talks by: Joseph Needham, E.N. da C. Andrade, Edward Appleton, W.E. Le Gros Clark, J.B.S. Haldane, Sir Charles Sherrington, Solly Zuckerman, C.F. Powell, Fred Hoyle, Julian Huxley, Edmund Whittaker, N.F. Mott, E.C. Bullard, C.D. Darlington, J.Z. Young, Spencer Jones, C.H. Waddington, O.R. Frisch, and Kurt Mendelssohn.

³⁵ “Research for Plenty,” *The Radio Times*, no. 1498 (July 25, 1952): 23.

³⁶ J.D. Bernal and Michael Polanyi, “The Organisation of Science and Scientists,” Radio Broadcast (Third Programme, September 1, 1948).

³⁷ W.B. Honey and Martin Johnson, “Science and the Arts: Have They Any Common Ground?,” Radio Broadcast (Third Programme, December 11, 1946).

³⁸ J. Isaacs, “Poetry and Science,” Radio Broadcast (Third Programme, January 17, 1949).

³⁹ “Science and the Singer,” *The Radio Times*, no. 1615 (October 22, 1954): 13.

⁴⁰ Grisewood to Clow, “Science Talks for Third Programme.”

There was much overlap between the science talks broadcast by the Third Programme and those broadcast by the Home Service, but one of the major differences between the Home and Third was that on the Third Programme, even talks on modern research were expected to be probing and analytical; didactic or merely expository talks about recent developments were to be avoided – as were talks on the fundamentals of science. This held true at least into the late 1950s, for after the meteorologist B.J. Mason pitched an idea for a Third Programme talk entitled ‘Man’s Influence on the Weather’, Clow wrote to Mason to inform him that given the proposed subject matter it would be “difficult to devise talks that were not in essence expository and that, of course, is regarded as unsuitable for Third Programme.”⁴¹

As adventurous and experimental as the Third Programme’s science programmes were when it came to subject matter, the manner in which they were presented was relatively conventional for the time. A majority were lecture-style talks by eminent scientists – of which a small portion were recordings or live relays of lectures delivered to prestigious scientific bodies such as the British Association for the Advancement of Science or the Royal Institution – while a small minority took the form of either a discussion between eminent scientists or a discussion between scientists and experts from other fields – e.g. philosophers, politicians, theologians, historians, economists, artists etc.⁴²

As a result, the competent publicist approach – for which Clow had fought so hard when attempting to overhaul *Science Survey* on the Home Service – never found a place on the Third Programme. Nor, in fact, did the type of live interview during which the interviewer can be heard questioning the scientist. When Gilbert Phelps, a talks producer in the West Region, wrote to the Third Programme to propose that the electrical engineer, Geoffrey Parr, be invited to interview the neurophysiologist W. Grey Walter on the “tremendous theoretical and philosophical implications”⁴³ of recent research into Delta and Theta waves, Grisewood was intrigued by the subject matter, but not by the proposed style of presentation. “I rather dislike

⁴¹ Archie Clow to BJ Mason, “Reference: 04/HT/AC,” February 14, 1956, RCONT1 Mason, B.J. (File I 1951-1962), Written Archives Centre.

⁴² A thorough – though by no means exhaustive – survey of the BBC’s Genome website identified 409 programmes about science broadcast by the Third Programme during the first ten years of its existence. Of those 409 total broadcasts, 375 were straight talks (of which, 31 were recordings or live relays of lectures delivered elsewhere), 19 were discussions, while 15 were features. These figures are intended as a heuristic assessment of the Third Programme’s science programming rather than as a definitive statement.

⁴³ Gilbert Phelps to Controller (Talks), “The Electrical Characteristics of the Brain,” January 18, 1948, RCONT1 Walter, William Grey (1948 - 1962), Written Archives Centre.

for the Third Programme the sort of broadcast that depends upon question and answer,” Grisewood explained to Phelps:

I should much prefer a straight talk by Grey Walter. If there is to be a discussion then it is another question, but I hope that the answers to the questions that Geoffrey Parr wants to put can be given in the talk without the interrogation itself being broadcast.⁴⁴

In general, regardless of whether the programmes took the form of a straight lecture, discussion, or interview, the speakers in science programmes on the Third were almost always eminent figures, and were almost always put in a position to make authoritative statements about their subject of expertise.

5.3. *The production of Third Programme talks on science*

The production of science talks on the Third Programme was in many ways quite different from the process that Clow was becoming accustomed to when developing programmes for the forces or even *Science Survey*. With *Science Survey* or *Science & Everyday Life* Clow was in charge of a weekly series and could therefore act with more authority in deciding how to present and frame each talk. In developing science talks for the Third Programme, on the other hand, Clow was much more of a middleman between scientists and the managers of the Third Programme. Clow did his best to stay abreast of important developments in the world of science, and when he felt he had identified a scientist who would interest the managers overseeing the Third Programme, Clow would pitch an initial idea for the talk to management – oftentimes before approaching the scientist in question. The board could then accept or reject the proposal, or suggest a different approach.

Clow was also not the only producer to propose or develop Third Programme science talks. T.S. Gregory, Peter Laslett, and P.H. Newby – to name but a few – all produced science talks for the Third Programme during their time at the BBC.⁴⁵ In fact, Jones notes that although Clow was the only scientist of the 30 producers in the Talks department at this time, he often received help from producers who were non-scientists, especially for science talks on the Third.⁴⁶

⁴⁴ Harman Grisewood to Gilbert Phelps, “The Electrical Characteristics of the Brain: Dr. Grey Walter,” March 9, 1948, RCONT1 Walter, William Grey (1948 - 1962), Written Archives Centre.

⁴⁵ For Gregory and Laslett, see Jones, “Speaking of Science,” 182. For Newby, see Mr. Holme and Mr. Lewin, “Third Programme Talks Meeting: 26 June 1950,” Memorandum, (Undated), R51/590/2, Written Archives Centre.

⁴⁶ Jones, “Speaking of Science,” 205.

It was also not unusual for scientists to approach Clow with proposals of their own. Indeed, Clow encouraged scientists to do so – provided he knew them to be competent broadcasters. On 26 September 1951, for instance, the physicist C.F. Powell wrote to Clow to propose a talk based on his recent work on heavy mesons. “I have recently been preparing an article for the Times Scientific Supplement”, Powell explained: “When I had completed it, I thought it might form a useful subject for two short broadcasts and I drafted the enclosed material.”⁴⁷

Once the Third Programme and a potential speaker had agreed upon a proposal for a talk, Clow would advise the speaker as to the Third Programme’s desires for the general outline of that talk. Whereas for *Science & Everyday Life* Clow would more often than not sketch the outline for an entire series of talks and simply slot in a scientist to flesh it out and deliver the talk, for science talks on the Third, Clow would leave a greater amount of the content and framing of the talk up to the scientist. For instance, after inviting Powell to give a talk on the Third Programme in 1949, Clow left the content of that talk almost entirely up to Powell. “I have been asked by Third Programme to invite you to give a talk on some aspect of your work,” Clow explained to Powell in a 7 January 1949 letter, “and am writing to suggest that you might let me have some indication of the things you would like to talk about.”⁴⁸ “The Third Programme’s interest is in ‘mesons’”, Clow explained, “but perhaps you may feel that that is just a rather narrow subject and might suggest some topic which is somewhat broader, but embracing mesons.”⁴⁹

Stripped of much of his control, Clow’s most significant role throughout the production process of Third Programme science talks was to act as a go-between advising scientists as to management’s expectations for the style and approach of Third Programme talks. These expectations went all the way back to the original 1946 brief for the Third Programme. After noting that the audience of the Third Programme was envisioned as intelligent and educated, the brief went on to explain: “The Programme need not cultivate any other audience, and any material that is unlikely to interest such listeners should be excluded.”⁵⁰ Effectively this meant that speakers on the Third – and the producers who looked after them – were under much less pressure to adjust the level of their talks compared to talks developed for the Light or Home.

⁴⁷ C.F. Powell to Archie Clow, Letter, (September 26, 1951), RCONT1 Powell, C.F. (File I 1948-1962), Written Archives Centre.

⁴⁸ Archie Clow to C.F. Powell, Letter, (January 7, 1949), RCONT1 Powell, C.F. (File I 1948-1962), Written Archives Centre.

⁴⁹ Clow to Powell, January 7, 1949.

⁵⁰ “Programme C Terms of Reference.” Cited in Carpenter, *The Emy of the World*, 12.

Indeed, it was considered undesirable to do so. Thus, whereas with *Science Survey* Clow would often advise scientists to imagine that their audience consisted of listeners with no more than a Sixth Form education and to adjust accordingly, for a Third Programme talk scientists were encouraged to envision their audience as university graduates who would be able to handle more difficult language and concepts. There were even those in management who expected listeners would have at least some scientific knowledge or training. In a 19 April 1949 memo, for instance, Christopher Holme, Chief Assistant (Third Programme), described the listener to whom science talks on the Third should be directed as “the intelligent layman, with some background of scientific reading”.⁵¹

Management also assumed that the Third Programme audience was capable of paying attention to talks of longer than 15 minutes. On 5 December 1950, for instance, Holme suggested that Powell should be offered more than the 15 minutes he had requested. “Our usual talks spaces are twenty-minutes in length”, he explained about Powell’s request:

... but we can always arrange to give more time provided we have enough notice. I think a fifteen-minute talk for this kind of subject would seem a bit scrappy to our people.⁵²

In a 1948 Third Programme broadcast commemorating the second anniversary of the launch of the service, one of the original supporters of the service, Harold Nicolson, informed the Third Programme audience that this freedom to broadcast longer programmes had been considered a pillar of the new service when it was being planned:

Sir William Haley pointed out to us that at the time the tendency of most broadcasting systems to aim at maximum audience was, apart from its other deleterious effects, tempting the producers of wireless programmes to become unduly affected by the lack of patience, the small staying power, possessed by the average listener.⁵³

According to Nicolson, Haley was worried that the continuation of this practice would lead to radio programmes that were “more and more hurried, snappy, scrappy, bitty and mechanical”,

⁵¹ Christopher Holme to C.T., “Terrestrial Magnetism,” Memorandum, (April 19, 1949), RCONT1 Blackett, P.M.S., Written Archives Centre.

⁵² Christopher Holme to H.W.R.P., “Professor Cecil Powell,” Memorandum, (December 5, 1950), RCONT1 Powell, C.F. (File I 1948-1962), Written Archives Centre.

⁵³ Harold Nicolson, “Birthday of the Third Programme,” *The Listener*, no. 1028 (October 7, 1948): 526–27.

leaving no opportunity for what Nicolson referred to as “the proper development of a single connected theme.”⁵⁴

As a result of this policy, a thirty-minute science talk was not unheard of on the Third. Indeed, Powell’s 1949 Third Programme talk, ‘Mesons’ ran to 30 minutes, ‘How Modern Science has Contributed to Philosophy’ by Sir Edmund Whittaker ran to 40 minutes, the discussion programme ‘Man and Nature’ – part of the 83-part series, *The Ideas and Beliefs of the Victorians* – ran to 45 minutes, and Lord Samuel’s 1948 address to the British Association entitled ‘Science and Philosophy’, clocked in at a whopping one hour and six minutes long. Thus, whereas *Science Survey* was eventually cut from 30 minutes to 15 minutes so as not to tax the attention spans of Home listeners, and while Clow eventually transformed *Science & Everyday Life* into a magazine programme for much the same reason, science programmes on the Third enjoyed the freedom to run as long as the subject matter of the talk seemed to dictate.

In a very real sense, science programmes on the Third Programme strove to be consciously unpopular. When Powell proposed a novel four-part series entitled ‘How Science Advances’ – a series that would walk listeners from the statement of a problem, through a hypothesis, experiment, and conclusion, and would feature a live radio description of an actual weather balloon experiment – Holme was intrigued, but worried that Powell did not quite have “a Third Programme audience in mind.” “The title”, he wrote on 5 December 1950, “rather suggests to me that he may be thinking of a level of popularization different from what we aim at.”⁵⁵ (The series was eventually broadcast within *Science Survey* to great acclaim.⁵⁶) This tradition of shunning popularization not only influenced the selection of topics deemed suitable for the Third Programme, but the style of science programmes as well. Thus, whereas during the planning of talks for *Science Survey* and *Science & Everyday Life* Clow would repeatedly remind potential speakers to pique the listener’s interest from the start, and to be lively and entertaining throughout, scientists speaking on the Third Programme were under less obligation to follow suit.

Even with Clow’s help, speakers were at times unable to hit the Third Programme target, as demonstrated by Holme’s reaction to Powell’s 1951 two-part series ‘New Mesons’. A week after the broadcast of Powell’s first talk, Holme wrote to Clow to express his dissatisfaction:

⁵⁴ Nicolson, “Birthday of the Third Programme,” 526–27.

⁵⁵ Holme to H.W.R.P., “Professor Cecil Powell.”

⁵⁶ The four-part series was broadcast between 19 April and 31 May 1951.

It is of course an original communication and as such right on the target for the Third Programme. There are however, things which struck me about it as suggesting that Professor Powell had not been sufficiently briefed as to Third Programme requirements.⁵⁷

First off, Holme criticized the talk for what he described as “a rather school-room tone”.⁵⁸ In his letter to Clow, Holme pointed to Powell’s phrase, “They can however be knocked to pieces ... disintegrated is the technical term”, and asserted: “It is clearly not necessary to explain the word ‘disintegrated’ to an educated audience.”⁵⁹ Holme further criticized Powell’s usage of the phrase, “Now if you are hearing of this idea for the first time you may perhaps find it remarkable”.⁶⁰ “This didactic language is not the sort that our speakers normally use”, Holme explained.⁶¹

Holme’s criticism of Powell’s talk was once again rooted in the BBC’s conception of the type of listener that would be attracted to a Third Programme talk on science. In contrast with the Home and Light, which were designed to serve a general audience, the Third was designed to serve a wide range of specialist audiences. Rather than listen to the Third throughout the evening, Third Programme listeners were expected to consult the *Radio Times* for talks that piqued their interest and tune in for those specific programmes. A 1953 Audience Research report entitled ‘The Third Programme: The Size and Character of its Public’ concluded that, indeed, “even the 5% of the population classed as the most frequent listeners to the Third spend less time in listening to it than they spend in listening to the other Services.”⁶² Further, the report found that 94% of what it classed as “Third Programme patrons”⁶³ consulted the *Radio Times* or billings in the press to identify the talks they hoped to hear, while just 6% would “switch on and hope for the best.”⁶⁴ Consequently, though the audience for the Third as a whole might be rather diverse with widely varied interests, the audience for a specific talk was primarily self-selected and therefore assumed to be interested in the subject matter. Thus, Holme concluded his 1951 letter to Clow by writing:

⁵⁷ Christopher Holme to Archie Clow, “Heavy Mesons - New Kinds of Atomic Particles (I),” Memorandum, (November 27, 1951), RCONT1 Powell, C.F. (File I 1948-1962), Written Archives Centre.

⁵⁸ Holme to Clow, “Heavy Mesons.”

⁵⁹ Holme to Clow, “Heavy Mesons.”

⁶⁰ Holme to Clow, “Heavy Mesons.”

⁶¹ Holme to Clow, “Heavy Mesons.”

⁶² Audience Research Department, “The Third Programme: The Size and Character of Its Public,” May 1953, 19, R9/6/13-16, Written Archives Centre.

⁶³ Audience Research Department, “The Third Programme: The Size and Character of Its Public,” 19. A patron was defined as a person who listened to the Third Programme once a month or more.

⁶⁴ Audience Research Department, “The Third Programme: The Size and Character of Its Public,” 20.

Of course I do not mean that a scientific speaker on the Third Programme should not make every effort to reduce the number of technicalities in his language and to make what he has to say available to as wide an audience as possible, but my quarrel with this talk is that the Professor has not made his task any easier by introducing a number of broadcast mannerisms, the object of which I suppose is to ‘make contact’ with the listener and ‘break down his resistance’ (to serious discussion). It may be assumed, I think, that a Third Programme listener will be listening because he is interested in the content of what the speaker has to say and only asks that it should be communicated to him directly, intelligently, and if possible, also agreeably.⁶⁵

Holme was therefore not arguing that scientists were free to use as much technical language as they might in an academic lecture. Rather, he was arguing that when drafting a talk for the Third, scientists need not go out of their way to make the talks less difficult or less serious in an effort to broaden the appeal of their talks.

This exchange in 1951 highlights the difficult task speakers faced when attempting to craft talks that would prove suitable for the Third Programme – especially if those same speakers had grown accustomed to delivering talks on the Light or Home. Powell had recently broadcast his highly popular four-part series on research into cosmic radiation for *Science Survey*, mentioned above, so it is possible he did not quite understand the BBC’s very different requirements for talks on the two networks. The exchange also highlights the difficult job faced by talks producers, for they were expected to help each speaker understand these different requirements for talks on the BBC’s three services.

5.4. ‘science for scientists’

In the fall of 1949, the BBC received two separate but nearly simultaneous letters that compelled management to re-examine its approach to science programming on the Third. The first came from Gordon T. Lines, an undergraduate – and member of the R.A.F. during the war – writing on behalf of the Botanical Society of University College, London; the second came from G.R. Morgan, also an undergraduate and Honorary Secretary of the Edinburgh University Geological Society, writing on behalf of representatives of seven scientific societies of Edinburgh University.⁶⁶ Both writers implored the Third Programme to direct a portion of its significant

⁶⁵ Holme to Clow, “Heavy Mesons.”

⁶⁶ G.R. Morgan to The Director, BBC Third Programme, “Untitled,” Letter, (November 17, 1949), R51/523/7, Written Archives Centre.

resources toward the production and transmission of science talks aimed at scientists themselves. As Lines put it: “A scientist explaining to other scientists what he is doing”.⁶⁷ These parallel requests called into question certain of the defining principles of the three-year-old service, and confronted the BBC with a conundrum over which it would puzzle for the better part of the next decade. As fate would have it, Clow was away on leave in the fall of 1949, and therefore did not have the opportunity to comment on these requests until after management had decided how to move forward.

Though Lines’s original letter does not appear to have survived, a report by Holme of a later meeting between himself and Lines conveniently summarizes the original concerns of Lines and his colleagues. Lines, according to Holme’s report, felt aggrieved that although the number of science undergraduates was “approximately equal to that of Arts undergraduates”, and although science undergraduates had, in his mind, “a wider general outlook than the Arts”,⁶⁸ science undergraduates were still not “adequately catered for by the BBC.”⁶⁹ “This sense of grievance”, noted Holme of his meeting, “was reiterated several times in the course of the interview though not in any captious spirit”.⁷⁰

Holme reported that what Lines and his colleagues wanted were “general reviews of modern research literature.”⁷¹ As Holme wrote in his report:

Asked whether they would not normally get these from the different technical publications, he said that everything they read tended to be in their own particular field of specialisation [...] since there was so much reading to do in their own field that they did not feel they could spare the time away from it. But it was when they were prepared to some extent to relax that they switched on the radio and it was then that they wanted talks on general scientific subjects.⁷²

⁶⁷ Christopher Holme to Harman Grisewood and Mary Somerville, “Mr. Gordon T. Lines,” Memorandum, (December 19, 1949), R51/523/7, Written Archives Centre.

⁶⁸ Lines asserted that this was true since “while [science undergraduates] were interested in humane subjects Arts undergraduates were seldom interested in science”. Holme to Grisewood and Somerville, “Mr. Gordon T. Lines.”

⁶⁹ Holme to Grisewood and Somerville, “Mr. Gordon T. Lines.”

⁷⁰ Holme to Grisewood and Somerville, “Mr. Gordon T. Lines.”

⁷¹ Holme to Grisewood and Somerville, “Mr. Gordon T. Lines.”

⁷² Holme to Grisewood and Somerville, “Mr. Gordon T. Lines.”

Holme further reported that although Lines and his colleagues listened to *Science Survey*, they were “often disappointed because it was clear that the programme was not for them.”⁷³

Similarly, G.R. Morgan began his letter on behalf of his colleagues at Edinburgh University by requesting that “a series of scientific broadcasts [...] be given on the Third Programme comparable in standard with those devoted to the Arts.”⁷⁴ Morgan had the good sense to begin with a bit of well-placed flattery. “It is evident from the specialised broadcasts on the Arts, and notably the classics and music,” he wrote, “that your department is fully aware of the power of the spoken word and has developed the technique of presentation to a high degree.”⁷⁵ “Our aim”, he explained, “is that the same facilities should be accorded to the scientist.”⁷⁶

Like Lines, Morgan and his colleagues felt the Third Programme should carry specialized broadcasts on science that would help scientists to communicate with *each other*. “Hitherto”, wrote Morgan:

... we have felt that the scientific broadcasts have been prepared with a view to interesting the layman, and whilst we appreciate the necessity of interpreting certain recent developments for the information of all thinking men, we consider that the medium of broadcasting should be used to enable the professional scientist to hear some of our leading experts deliver papers designed for this limited audience.⁷⁷

Morgan estimated that by devoting “at least one hour a week” to this purpose, scientists would be able to hear “from four to six talks a year on our own particular branch of science” – “a facility”, he noted, “for which all scientists both in this country and abroad, would be grateful.”⁷⁸ Crucially, Morgan and his colleagues hoped that by directing the broadcasts to scientists themselves rather than non-scientists, the Third Programme would enable the country’s “greatest contemporary philosophers and experimentalists” to deliver their talks “in the terms accepted by scientists and without the distortion inseparable from the translation of these thoughts into the everyday language of the layman”.⁷⁹ Both groups, then, wanted the Third Programme to

⁷³ Holme to Grisewood and Somerville, “Mr. Gordon T. Lines.”

⁷⁴ Morgan to The Director, BBC Third Programme, “Untitled.”

⁷⁵ Morgan to The Director, BBC Third Programme, “Untitled.”

⁷⁶ Morgan to The Director, BBC Third Programme, “Untitled.”

⁷⁷ Morgan to The Director, BBC Third Programme, “Untitled.”

⁷⁸ Morgan to The Director, BBC Third Programme, “Untitled.”

⁷⁹ Morgan to The Director, BBC Third Programme, “Untitled.”

broadcast weekly condensations of up-to-date research in the language of science for consumption by scientists.

Officially, Holme and his Third Programme colleagues were non-committal about these requests. In a 29 November 1949 letter to Lines, Holme explained that although it was the Third Programme's policy to "increase the science content of the Programme as far as we can", the aim of the service was ultimately "to mount such scientific talks as will appeal to those specialising in other subjects though they may not contain anything new for those specialising in the subject concerned."⁸⁰ Holme expressed much the same to Morgan on 21 December. Privately, however, management were open to this suggestion. In a 21 December 1949 memo to Grisewood and Somerville, in fact, Holme wrote that the "onslaught" by Morgan and "demonstration in force" by Lines had raised "an important point of principle which perhaps we need to consider afresh."⁸¹ "Hitherto", he explained:

... we have assumed that our science broadcasts are directed at a general audience; an audience, it is true, of trained minds but not necessarily an audience of scientists. I guess that the pressure will increase upon us to put out talks designed principally for scientists.⁸²

At issue, then, was the Third Programme's commitment to serving minority interests and its goal of encouraging communication between these specialized branches of activity. Since its launch three years prior, the Third Programme had viewed science *as a whole* as a specialized branch of activity to be placed alongside philosophy, history, or politics. The approaches by Lines and Morgan caused the managers of the Third Programme to contemplate whether biologists or chemists or physicists or engineers should qualify as specialized branches of activity *in and of themselves*. Were the Third to decide that indeed they did, then biologists could rightly demand programmes designed to meet their own specialized needs – as could chemists, physicists, engineers etc. Thus, Holme noted that while the Third Programme's current science programming sought to assist in breaking down the barriers "which divide scientists from the rest of the community", the adoption of such a policy would entail developing science programmes "to assist in breaking down the barriers of specialisation which divide scientists

⁸⁰ Christopher Holme to Gordon T. Lines, "Untitled," Letter, (November 29, 1949), R51/523/7, Written Archives Centre.

⁸¹ Christopher Holme to Harman Grisewood and Mary Somerville, "Science Talks in the Third Programme," Memorandum, (December 21, 1949), R51/523/7, Written Archives Centre.

⁸² Holme to Grisewood and Somerville, "Science Talks in the Third Programme."

from one another”.⁸³ As he explained later, the former could be viewed as “reports on science for the general listener”, while the latter were “reports on science for the scientist”.⁸⁴ “Either of these two”, he concluded, “must be, I suppose, considered a worthy Third Programme aim, to be placed in some relation with its other aims.”⁸⁵ Mary Somerville agreed, noting in a memo to Holme and Grisewood that she would be “rather glad to respond to the suggestion of broadcasts on science for scientists”.⁸⁶

Holme and Somerville not only reacted favorably to the suggestion of broadcasting ‘science for scientists’, they also agreed with Morgan and his colleagues that such broadcasts would have the benefit of avoiding the ‘distortion’ of scientific results. “I do not find the word ‘distortion’ exaggerated”, Holme explained to Grisewood and Somerville: “The larger the audience to which the scientific result has to be made intelligible the greater the danger that its essential meaning will be lost.”⁸⁷ Somerville, for her part, took a slightly different view. In her mind, the issue was with the audience. “I don’t myself agree that distortion is ‘inseparable from the translation ... into everyday language’”, she wrote in her memo to Holme and Grisewood:

The distortion [takes] place I believe in the mind of the lay listener, who partly for lack of background experience as well as learning and particularly for lack of training in scientific method, cannot properly grasp what the scientist is saying to him.⁸⁸

Somerville later expanded on this point:

Jack Haldane long ago demonstrated this most effectively to a Sixth Form (Science Mixed and Humanities) at the Polytechnic after one of his own Sixth Form broadcasts, showing that the same statements had meant two altogether different things to the specialists and non-specialists, and why. Ever since then I have been personally dubious about the value of science broadcasts for laymen [...].⁸⁹

Thus, put in the terms that would gain wide currency decades later, Holme envisioned the problem as one of translation, whereas Somerville envisioned it as one of reception. Adopting a

⁸³ Holme to Grisewood and Somerville, “Science Talks in the Third Programme.”

⁸⁴ Holme to Grisewood and Somerville, “Science Talks in the Third Programme.”

⁸⁵ Holme to Grisewood and Somerville, “Science Talks in the Third Programme.”

⁸⁶ Mary Somerville to Harman Grisewood and Christopher Holme, “Science Talks in the Third Programme,” Memorandum, (December 23, 1949), R51/523/7, Written Archives Centre.

⁸⁷ Holme to Grisewood and Somerville, “Science Talks in the Third Programme.”

⁸⁸ Somerville to Grisewood and Holme, “Science Talks in the Third Programme.”

⁸⁹ Somerville to Grisewood and Holme, “Science Talks in the Third Programme.”

'linear' model approach to the communication of science, neither questioned the messenger or the message itself. Considering Clow's comments in the previous chapter about the poor broadcasting skills of many scientists, he might have disagreed with Holme and Somerville had he not been on leave.

The question that remained, however, was how the BBC might meet this demand for specialized broadcasts for scientists. As Holme wrote in his memo to Somerville and Grisewood,

It remains to ask, supposing the provision of scientific talks for scientists were to be exploited as a BBC and Third Programme responsibility, at what level of specialisation should they be given? It is here, I think, that we should be saved from the extremes of specialisation by the medium. The virtual elimination of mathematical and other symbols will make it next to impossible to give more than a general picture of most results and impossible to give any account at all of some.⁹⁰

This was similar to something Holme had attempted to explain in his initial response to Morgan:

But there is a special difficulty in dealing with science through the medium of sound broadcasting which [is] particularly difficult to overcome at the level implied by a broadcast designed primarily for other scientists. This is the dependence of scientific exposition on visual symbols, mathematical and otherwise and on ocular demonstration. A glance through any issue of 'Nature' will show the extent of the loss caused by an inability to supply visual matter.⁹¹

Thus, Holme suggested that an acknowledgement of the limitations of radio broadcasting might provide the BBC with a convenient way of meeting the demands of scientists for higher-level scientific talks without having to plumb the depths of obscurity and jargon. Proceeding along these lines, wrote Holme to Grisewood and Somerville, would, on the one hand, "relieve any scientific talks producer of the need to consider the layman within this limited field", while on the other, the producer "would be still happily prevented by the sound broadcasting medium from putting straight on to the air a scientific paper."⁹²

⁹⁰ Holme to Grisewood and Somerville, "Science Talks in the Third Programme."

⁹¹ Christopher Holme to G.R. Morgan, "Untitled," Letter, (December 21, 1949), R51/523/7, Written Archives Centre.

⁹² Holme to Grisewood and Somerville, "Science Talks in the Third Programme." Holme was careful to point out, however, that talks of this sort should in no way replace the Third Programme's existing scientific programmes aimed at non-scientists.

Holme expressed as much in his subsequent communications with Morgan and Lines. Though a survey of the BBC's archives uncovered no record of a response from Morgan and the Edinburgh delegation, Holme's explanation seems to have satisfied Lines. In fact, Holme reported that after meeting with Lines, it appeared the BBC was already broadcasting the type of high-level scientific programme Lines and his colleagues desired. "He appeared to have heard and to have approved [of] almost all the science talks which have been in the Third Programme during the year" wrote Holme of his meeting with Lines: "The complaint was only on the score of quantity. The quality and the level of approach, it seemed were right."⁹³ Julian Huxley's 1949 two-part series, 'Genetics Today' – which was essentially a review of books by CD Darlington and Kenneth Mather – was found to be "exactly right".⁹⁴ "Although they contained a good deal in his own particular field," Holme explained, "they contained much that was new to him because he had not the time to read the literature in which all these different lines of research could have been studied."⁹⁵

After all this, Grisewood wrote to Holme to thank him for his work with Lines and Morgan, and noted that Holme's report had confirmed "much that we have felt for some time."⁹⁶ "I hope", he continued, "that the suggestions [Lines] makes will be followed up in cases where it is thought suitable to do so."⁹⁷

5.5. *More of the same*

There is ample evidence that the Third Programme did indeed increase the quantity of its science broadcasts over the course of the following year. On 18 October 1950, for instance, Holme wrote to Clow to remind him that the network would "continue to provide one space weekly"⁹⁸ – double the Third Programme's previous fortnightly commitment. Even before the approaches by Lines and Morgan, many at the BBC had already been discussing the need to increase the quantity of science talks on the Third. In the summer of 1949 the BBC had been forced to re-examine its policy with regards to science broadcasting on the BBC as a whole in response to an approach by the physicist, Marcus Oliphant. Allan Jones has written extensively

⁹³ Holme to Grisewood and Somerville, "Mr. Gordon T. Lines."

⁹⁴ Holme to Grisewood and Somerville, "Mr. Gordon T. Lines."

⁹⁵ Holme to Grisewood and Somerville, "Mr. Gordon T. Lines."

⁹⁶ Harman Grisewood to Christopher Holme and Mary Somerville, "Science Talks in the Third Programme," Memorandum, (December 23, 1949), R51/523/7, Written Archives Centre.

⁹⁷ Grisewood to Holme and Somerville, "Science Talks in the Third Programme."

⁹⁸ Christopher Holme to Archie Clow, "Science Talks: Progress Report," Memorandum, (October 18, 1950), R51/523/7, Written Archives Centre.

about the contents of Oliphant's approach, the subsequent convening of a "Special Sub-Committee to Consider Broadcasts on Science" in the summer of 1949 (known informally as the 'Anderson Committee' after its chairman Sir John Anderson) and the BBC's eventual response that November,⁹⁹ but it is worth noting that Oliphant not only suggested the BBC should increase its quantity of science talks, but suggested that the Third Programme should carry specialized science programmes for scientists. When Oliphant submitted an outline of six types of programmes he felt the BBC should begin broadcasting in order to carry a more well-rounded collection of science programmes, one of the series he called for was a Third Programme series described as:

A weekly 'newsletter' on science directed to scientists and technologists themselves, and not in any way 'popular', except that it should be put out in the broader and not the narrowly specialized language of science.¹⁰⁰

As a hypothetical example Oliphant suggested a talk by C.F. Powell on recent research into cosmic rays.¹⁰¹

Clow, too, was showing signs that he hoped to increase the quantity of science talks on the Third. For instance, when P.M.S. Blackett declined Clow's offer to deliver a Third Programme talk on terrestrial magnetism, Clow attempted to persuade him by alluding to his own desire to lay the groundwork for future talks on science. "I am, however, rather anxious to satisfy this demand of the Third", wrote Clow to Blackett on 18 May 1949, "since I do not want them to turn round and say to me later on 'We offered you a space for a science programme and you didn't fill it'."¹⁰²

A letter from Holme to Clow on 4 June 1952 gives a further indication of the way the Third Programme conceived of science and science broadcasting in the years following these approaches by Lines, Morgan, and Oliphant. When the quantity of science broadcasts in 1952 dipped well below the previous high watermark of 1951 – i.e. one talk per week – Holme wrote to Clow to chastise him for the failure of supply. Though Clow attempted to explain the reasons for the drop in production – "Just now I am finding that scientists are certainly not unwilling to

⁹⁹ For more on Oliphant's approach, see Jones, "Speaking of Science," 190–96.

¹⁰⁰ M.L.E. Oliphant, "A Suggested Series of Programs [Sic] on Science," July 7, 1949, R6/34, Written Archives Centre.

¹⁰¹ Oliphant, "A Suggested Series."

¹⁰² Archie Clow to P.M.S. Blackett, Letter, (May 18, 1949), RCONT1 Blackett, P.M.S., Written Archives Centre.

collaborate but they do indeed take a very long time to get out their material”¹⁰³ – Holme was not satisfied:

In view of the part played by science in modern society and the volume of scientific work which is published every week all over the world, [one science talk per week] does not seem excessive. It might turn out to be so if there were a shortage of scientists on whom we could draw to give the talks, but there are so many distinguished scientists who have not given talks in the Programme that this does not seem to be the case. I have no doubt that many of them will prove difficult customers to bring to the microphone, as some already have done, and I do appreciate the difficulties on your side. But it is a fact that the supply of science talks this year has been far below the average we aim at [...].¹⁰⁴

Despite Clow’s explanation for the drop in science talks, Holme informed Clow that it would be “difficult to find any terms in which to justify this fact to that section of our listeners with whom we have undertaken to maintain the science content of the Programme.”¹⁰⁵

Holme’s letter is worthy of note for it demonstrates that the managers of the Third Programme were attempting to maintain a higher output of science content in the years following the approaches by Lines, Morgan, and Oliphant. Furthermore, it demonstrates that these managers also apparently felt that they had entered into a commitment with Third Programme listeners to follow through with this increase. Whether by ‘that section of our listeners’, Holme was referring to ‘intelligent laymen’, Oliphant and the subsequent ‘Anderson Committee’, or the undergraduate deputations from Edinburgh and UCL, is not clear. What is clear is that the Third Programme had gone out of its way to increase the quantity of its science talks in response to requests from its listeners.

While the fact that the Third Programme altered the quantity of its science programming in response to listener requests might initially seem surprising considering its reputation for shunning audience desires, Grisewood stressed that the Third was, on the contrary, quite open to changing to meet the needs of its audience. In his commemorative talk for the fifth anniversary of the service, Grisewood explained that the constant debate about the pros and cons of the

¹⁰³ Archie Clow to Christopher Holme, “Third Programme Science Talks,” Memorandum, (May 28, 1952), R51/523/7, Written Archives Centre.

¹⁰⁴ Christopher Holme to Archie Clow, “Third Programme Science Talks,” Memorandum, (June 4, 1952), R51/523/7, Written Archives Centre.

¹⁰⁵ Holme to Clow, “Third Programme Science Talks.”

service was invaluable. “Indeed, I sometimes think that if the opposition to the Third Programme dried up altogether, it might be my duty to put some sharp attacks upon it into circulation”, he quipped.¹⁰⁶ He went on to assert that the debate itself helped “to determine the place of the Third Programme in broadcasting and in the society that it serves.”¹⁰⁷

What is less clear – and what Holme did not mention in his letter to Clow – was whether the managers of the Third had also made a conscious effort to develop specialized science programmes aimed specifically at scientists. A survey of the BBC’s archives failed to uncover any memos or reports from the following years that mention a movement within the BBC to develop such programmes. This should perhaps not be too surprising given that Holme warned Morgan that “some little time” might elapse before he would be able to give a definite reply,¹⁰⁸ and, further, that Somerville suggested management should “defer any decision about the proposal” for the time being.¹⁰⁹

Though there is scant documentary evidence to help answer this question directly, C.F. Powell’s broadcasts can once again serve as a good indication of the Third Programme’s approach to science throughout this period. For instance, when Clow and Powell tried to plan a Third Programme talk in 1950 based on the scheme for Powell’s 1950 Scott Lectures, at no point in the planning of the talk did Clow advise Powell to aim the talk at scientists. On the contrary, Clow advised Powell to keep the talk more general. “I feel”, wrote Clow to Powell on 3 July 1950, “that if you could discourse on the general ‘story’ of this work without having to bring in too many of the technical details, it would make an extremely useful review of this particular part of physical science.”¹¹⁰ Further, as previously mentioned, though Holme criticized Powell’s 1951 talk for what he felt was a rather schoolroom tone, Holme noted that his criticism was not meant to suggest that a scientist speaking on the Third should not make “every effort to reduce the number of technicalities in his language and to make what he has to say available to *as wide an audience as possible*”.¹¹¹ Thus, although each of Powell’s talks were intended to be reviews of science along the lines that Lines, Morgan, and Oliphant had requested – indeed Oliphant had specifically suggested a talk by C.F. Powell – the comments of Clow and Holme demonstrate that these talks were nonetheless intended to be directed at a general audience.

¹⁰⁶ Grisewood, “The Place of the Third Programme,” 541.

¹⁰⁷ Grisewood, “The Place of the Third Programme,” 541.

¹⁰⁸ Holme to Morgan, “Untitled.”

¹⁰⁹ Somerville to Grisewood and Holme, “Science Talks in the Third Programme.”

¹¹⁰ Archie Clow to C.F. Powell, Letter, (July 3, 1950), RCONT1 Powell, C.F. (File I 1948-1962), Written Archives Centre.

¹¹¹ Holme to Clow, “Heavy Mesons.” Emphasis added.

Just because the Third does not appear to have set out to develop specialized science programmes for scientists, however, does not mean the Third did not broadcast science programmes that fulfilled much the same role. After all, as discussed above, Holme reported that Lines had approved of the Third's existing scientific fare; what he and the UCL contingent seemed to truly want was *more* of the same. Thus, despite the fact that the Third Programme's science talks appear to have continued to be intended for an audience "of trained minds but not necessarily an audience of scientists"¹¹² – as Holme had put it in 1949 – the talks nonetheless served a similar purpose to the "general reviews of modern research literature" that Lines had requested.¹¹³

The programmes may have been a bit more 'popular' than Lines or Morgan had wanted – and a bit too advanced for some of the non-scientists in the audience – but judging by the BBC's own audience research it would appear Lines was not the only scientist in the Third Programme audience who appreciated and valued these talks. This is evident in the audience research report for the second talk of Powell's two-part Third Programme series 'New Mesons'. Many of the scientists in the audience praised the talk and expressed their appreciation for talks that enabled them to stay abreast of developments in modern science. A respondent listed as a 'Physics Teacher', for instance, noted: "I greatly appreciate talks on modern science at an authoritative level, they fill a real need for schoolmasters."¹¹⁴ Similarly, a 'Surgeon' wrote: "I personally rely on this type of broadcast to save hours of weary reading and keep myself fairly up-to-date in science."¹¹⁵ In a possible allusion to Vannevar Bush's *Science, the Endless Frontier*, a 'Research Student' concluded: "Radio has a unique part to play in keeping the frontier well manned, in helping such unknowns as me to keep in touch with great men who lead the advance."¹¹⁶

At least one of the BBC's talks critics felt that the level of the Third's scientific talks was about right for those Third Programme listeners not trained in science. In a 1951 assessment of the Third Programme's recent high-level talks in a number of different areas – including and in particular Huxley's six-part series *The Process of Evolution* – the radio critic John Pringle concluded:

¹¹² Holme to Grisewood and Somerville, "Science Talks in the Third Programme."

¹¹³ Holme to Grisewood and Somerville, "Mr. Gordon T. Lines."

¹¹⁴ Audience Research Department, "Listener Research Report: 'New Mesons' Talk by C.F. Powell (26 November 1951)," December 17, 1951, R9/68/22, Written Archives Centre.

¹¹⁵ Audience Research Department, "Listener Research Report: 'New Mesons' Talk by C.F. Powell (26 November 1951)."

¹¹⁶ Audience Research Department, "Listener Research Report: 'New Mesons' Talk by C.F. Powell (26 November 1951)."

“I may be more of a highbrow than I, or anyone who knows me, has ever suspected, but I should say the ‘level’ was about right.”¹¹⁷ Pringle – a non-scientist – was pleased to report that Huxley’s talk had been “within the reach of any generally-educated person”.¹¹⁸ Pringle feared, however, that if the Third sought to raise the level any higher such talks would only be understandable to a select few. “No doubt the cerebral stratosphere has many mansions”, Pringle quipped, “we may confidently await, though not hope for, the coming some day of the Fourth, Fifth, and Sixth Programmes, in which a word or two may be just intelligible every fifteen minutes.”¹¹⁹ To further emphasize his point, Pringle noted that any attempt by the Third Programme to increase the level or specialization of its already high-level talks would be frustrated by the limitations of the medium. In doing so he – unbeknownst to him – echoed Holme’s response to Lines and Morgan two years prior:

Broadcasting, after all, is communication; there are limits to the complexity of the matter which can be assimilated through a voice talking without interruption from a box in the sitting-room. The Third, so far as one can judge from the past week, assesses these limits accurately.¹²⁰

Throughout this period it would seem the Third Programme agreed with Pringle and strove to ensure that its science broadcasts remained fit for the Third rather than the Sixth – i.e. within reach of the educated non-scientist.

5.6. *The arrival of ‘science for scientists’*

In 1949 Holme had posited that should the Third attempt to mount a series of science broadcasts directed at scientists, such a series would strive to break down barriers between different fields of science rather than between science and other intellectual pursuits. Though, as has been seen, the Third Programme was initially wary of mounting such a series, by 1957 it had apparently had a change of heart. From April 1957 to August 1958 the Third Programme broadcast a monthly series entitled *Research*, described by the *Radio Times* as: “A series of monthly discussions between scientists on topics of current interest in their field of study.”¹²¹ The *Radio Times* explained to potential listeners that discoveries in one area of science often led to further

¹¹⁷ John Pringle, “The Spoken Word - Third Return,” *The Listener*, no. 1180 (October 11, 1951): 619.

¹¹⁸ Pringle, “The Spoken Word - Third Return,” 619.

¹¹⁹ Pringle, “The Spoken Word - Third Return,” 619.

¹²⁰ Pringle, “The Spoken Word - Third Return,” 619.

¹²¹ “Research,” *The Radio Times*, no. 1744 (April 12, 1957): 45.

discoveries in others, and noted that each programme in the new series would therefore bring together “a group of scientists from different disciplines, but with a common interest”.¹²² “The frontiers of science are continually expanding, and almost every day new discoveries are being made”, the article announced:

But it is not just a matter of the individual scientist making a discovery and communicating it to a learned journal, thus adding a few more bare facts to the already vast store of established knowledge. Each new discovery may set off a chain reaction of re-examination of previous work, and open up new fields of study and speculation.¹²³

The article then went on to cast the listener in the role of eavesdropper – the title of the article was ‘Scientists Overheard’ – noting that the series would enable listeners to “overhear, as it were, the effect that exciting research has on the scientists themselves.”¹²⁴

The audience research reports for the series provide a glimpse into the content and approach of the series. The report for the first broadcast in the series, for instance, referred to the series as “a programme for scientists, by scientists” and noted that those in the audience with scientific training agreed that the programme had been “a stimulating and highly rewarding symposium, at a satisfyingly advanced level”.¹²⁵ In fact, the Audience Research department seemed inordinately concerned with gauging the reaction of the scientists in the audience. In an unusual move, the department asked members of the listening panel to state whether they had undertaken any scientific training beyond school level, and further invited panel members to transmit the views of any “scientist friends” who had heard the discussion.¹²⁶

The responses from the scientists in the audience for the first broadcast of *Research* were much the same as the response to previous high-level scientific talks. For instance, the report for the inaugural broadcast included the views of a ‘Pathologist’ who wrote:

The material was first-rate and gave me a good deal of up-to-date knowledge in a field which only overlaps the fringes of my present work. In fact, it was the equivalent of

¹²² “Scientists Overheard,” *The Radio Times*, no. 1744 (April 12, 1957): 29.

¹²³ “Scientists Overheard,” 29.

¹²⁴ “Scientists Overheard,” 29.

¹²⁵ Audience Research Department, “Audience Research Report: ‘Research I: Nucleic Acids and the Virus’ - 17 April 1957,” May 9, 1957, R9/6/61-64, Written Archives Centre. In a bit of vindication for Holme, however, many listeners reported that they were keenly aware of the lack of visual aids.

¹²⁶ Audience Research Department, “Audience Research Report: 17 April 1957.” All told, 51 out of 86 respondents had “studied scientific subjects beyond school level”.

many hours of laborious reading. I think a series of this kind, on any highly specialized subject, is of inestimable value to workers in allied fields and is a really excellent idea.¹²⁷

Similarly, a 'Botanist' commented: "These broadcasts are going to be very useful to me. I have so little time for aspects of science other than my own, that I am probably more ignorant than many laymen on certain subjects."¹²⁸

Many of the non-scientists in the audience also appear to have appreciated the new series – albeit for different reasons. With *Research*, the Third Programme did not fully disregard non-scientists, but rather shifted its expectations for what non-scientists might be expected to take from such broadcasts. Indeed, in June 1957 R.D'A. Marriot, Assistant Director of Sound Broadcasting, described the series as "a programme by distinguished scientists but of interest to intelligent laymen".¹²⁹ 'Interest', was a telling choice of words, for when it came to gauging the reactions of the non-scientists who listened to *Research*, the Third appeared to be satisfied as long as these 'intelligent laymen' found the programmes to be interesting or enjoyable; whether or not this segment of the audience was able to understand the discussions enough to engage with the points being raised was of less concern. Thus, the audience research report for the first broadcast in the series noted:

Those with no scientific training beyond school level (35 listeners) seemed well disposed towards the idea of this series as well. Certainly, they not infrequently found themselves out of their depth, but they tended to feel that the discussion was worth listening to despite the undoubted effort it demanded from the layman. Though a Schoolmaster, for one, was sorry to say that he gained nothing from such broadcasts as this, and a Doctor's wife considered that it was 'definitely for specialists', they willingly conceded that it was 'an excellent thing all the same', while others (even those who were sometimes at a loss) observed that the subject was fascinating, that the speakers had made their points sufficiently clearly, and that they themselves had gained not a little from the programme.¹³⁰

Having finally developed a series of broadcasts on science for scientists, it appears that Third Programme management had adjusted the criteria by which they judged the success of a

¹²⁷ Audience Research Department, "Audience Research Report: 17 April 1957."

¹²⁸ Audience Research Department, "Audience Research Report: 17 April 1957."

¹²⁹ A.D.S.B. to C.P.P. (S), "Science Broadcasts," Memorandum, (June 7, 1957), R51/967/1, Written Archives Centre.

¹³⁰ Audience Research Department, "Audience Research Report: 17 April 1957."

broadcast. Scientists were expected to engage in conversations about the content of the talk; non-scientists, it was hoped, would find the programmes to be interesting.

5.7. *Criteria for success on the Third*

Perhaps surprisingly, a look back at the Third Programme's high-level science talks over the previous decade suggests that in many ways differing levels of audience comprehension had long been assumed when the Third gauged the success of such programmes. Despite the fact that the Third Programme's high-level science talks were nominally designed to engage intelligent non-scientists in conversations about developments in science and about the impact of those developments on other intellectual pursuits, audience research reports from the first decade of the Third's existence show that the Third had long accepted that a large segment of its audience would find the content of these talks difficult to understand. For instance, the report for the second of Powell's two talks on 'New Mesons' summarized the reactions of non-scientists in language that bears a striking resemblance to the language used to describe reactions to *Research*:

A number of listeners complained that this talk was completely above their heads – a fact which very much annoyed them – but others, even if they could not grasp the significance of everything that C.F. Powell said, seemed to agree that this was a type of broadcast which should not be kept off the air just because it was 'difficult'. In fact several members of the small reporting audience said that they enjoyed hearing about new advances in scientific fields even if the details of research were beyond them.¹³¹

While *Research* may have marked the first instance when the Third Programme relieved its producers from the requirement to 'consider the intelligent layman', it was not the first time that the Third had accepted that many listeners would not be able to understand the content of its high-level science talks.

An audience research report for Sir Edmund Whittaker's 1951 talk 'Eddington's Principle in the Philosophy of Science' sheds some light on why listeners seemed to enjoy such talks regardless of whether they understood the content:

¹³¹ Audience Research Department, "Listener Research Report: 'New Mesons' Talk by C.F. Powell (26 November 1951)."

So many members of this Panel audience (approximately half of those reporting) found Sir Edmund Whittaker's lecture above their heads – either in part or as a whole – that it is difficult to account for the higher Appreciation Index recorded. But perhaps this Doctor's comment provides a clue: 'I tried very hard to follow this talk, but quite frankly most of it was above my head. I'm afraid I'm not enough of a mathematician to understand it. I was, however, very pleased to have the opportunity of hearing so distinguished a scientist as Edmund Whittaker.'¹³²

The report continued by noting that the very fact of Whittaker's eminence seemed to have colored listeners' reactions to the talk. "But in general" explained the report, "these listeners' comments give the impression that as the speaker was an eminent scientist talking on the Third Programme on his own subject they were unwilling to offer any adverse criticism".¹³³ Thus, it would appear that by at least 1951, the Audience Research department had come to the conclusion that as long as the talk was delivered by an eminent scientist, non-scientists would enjoy – or at least report that they enjoyed¹³⁴ – high-level talks on science regardless of whether they understood the content of that talk.¹³⁵

Even Martin Armstrong, critic for *The Listener*, admitted that he thoroughly enjoyed Third Programme talks on science despite the fact that he often felt modern science had "so far outstripped the understanding of us un-scientific folk that some branches of it are about as assimilable to us as a porterhouse steak to a new-born babe."¹³⁶ In the December 1956 edition of *The Listener*, Armstrong wrote:

I often find when I listen to scientific talks that at first all is clear and even exciting, and every now and then I am given some rich titbit of fact or theory which I seize on with wonder and delight. But after awhile obscurities intrude; the science is becoming too

¹³² Audience Research Department, "Listener Research Report: 'Eddington's Principle in the Philosophy of Science' Talk by Sir Edmund Whittaker (24 November 1951)," December 11, 1951, R9/68/22, Written Archives Centre.

¹³³ Audience Research Department, "Listener Research Report: 'Eddington's Principle in the Philosophy of Science' Talk by Sir Edmund Whittaker (24 November 1951)."

¹³⁴ Indeed, it is difficult to discern whether Sir Edmund's presence helped listeners *truly* enjoy the talks, or whether his presence simply made listeners wary of offering any criticism.

¹³⁵ Mary Adams had come to a similar conclusion about the audience for science talks on the BBC more generally back in 1936 – a decade before the launch of the Third Programme. For more on her views of the BBC audience for science talks, see Jones, "Speaking of Science," 116.

¹³⁶ Martin Armstrong, "The Spoken Word - The Light Programme," *The Listener*, no. 996 (February 26, 1948): 355.

scientific for me; I fail to grasp a point here, a point there, so that when I reach the end all I retain is the titbits; the deeper significance of the whole has eluded me.¹³⁷

Regardless, Armstrong went on to explain that these ‘titbits’ made the talks well worth listening to, and complimented D.R. Newth’s recent Third Programme talk ‘Unfolding Form’ for providing him with some “enthraling details” and “astonishing facts” about the development of animals.¹³⁸

The 1953 audience research report, ‘The Third Programme: The Size and Character of its Public’, helps to explain why the Third Programme seemed content in spite of reports that a good deal of its audience was finding its high-level talks on science to be rather too high-level. The report examined the Third Programme audience in general, but its conclusions nonetheless have implications for the audience for Third Programme science programmes. By analyzing listeners against four criteria (viz. “‘educational level’, ‘intelligence level’, ‘degree of interest in a specified range of subjects or activities with which the Third Programme frequently deals’ and ‘reading of periodicals of a level of sophistication similar to that of the Third Programme’.”¹³⁹) the survey hoped to classify potential listeners as either ‘good’, ‘fair’, ‘poor’, or ‘very poor’ prospects for Third Programme listening. With regards to the entire population, the report concluded that only 2% of the population could be classified as ‘good’ prospects, and 6% as ‘fair’ prospects.¹⁴⁰ When considered in light of the listening patterns of these four groups, the survey concluded that out of every 100 people who listened to the Third at least once a month, upwards of 75 would have to be classified as ‘poor’ or ‘very poor’ prospects.¹⁴¹ The report sought to explain this by noting:

... it could, and probably does mean that a very large proportion of Third Programme patrons are what have been described as ‘aspirants’, i.e. people who from time to time want to enjoy what it offers and therefore listen to it even though they are not in fact likely to possess the qualifications needed for its full appreciation.¹⁴²

¹³⁷ Martin Armstrong, “The Spoken Word - Fact, Feeling, and Fiction,” *The Listener*, no. 1445 (December 6, 1956): 964.

¹³⁸ Armstrong, “The Spoken Word - Fact, Feeling, and Fiction,” 964.

¹³⁹ Audience Research Department, “The Third Programme: The Size and Character of Its Public.”

¹⁴⁰ Audience Research Department, “The Third Programme: The Size and Character of Its Public.”

¹⁴¹ Audience Research Department, “The Third Programme: The Size and Character of Its Public.”

¹⁴² Audience Research Department, “The Third Programme: The Size and Character of Its Public.”

The important thing to note about this report is not whether these listeners were indeed unable to meet Third Programme broadcasts “on equal terms”¹⁴³ as the report later put it – in fact, the survey was not capable of gauging comprehension since it was based on assumptions about necessary qualifications rather than on actual tests of listener comprehension – but that, assuming the Third Programme read and accepted the findings of the report, Third Programme broadcasts would have been developed with an understanding that over the course of a month, only 25% of the people who listened to the Third would be able to comprehend what they heard. Judging by the Audience Research department’s reports, the Third appeared to be satisfied as long as the other 75% (read: ‘aspirants’) found Third Programme broadcasts to be interesting or enjoyable. And given that the Third Programme remit specified that it “need not cultivate any other audience”, the Programme was under little pressure to alter its approach to ensure that these ‘aspirants’ were able to understand Third Programme talks.¹⁴⁴

In a sense, then, the Third Programme might hope that one day these ‘aspirants’ would be able to meet a high-level talk about science ‘on equal terms’ – indeed, the ‘tri-part pyramid’ was meant to slowly raise listeners’ tastes until they were capable of appreciating talks on the Third – but until then such broadcasts were not meant for them. ‘Aspirants’ might still appreciate the chance to hear directly from a great thinker or learn a few titillating titbits about research on macrophages, but they would not have been expected to engage critically with the questions brought up by the talk – e.g. questions about the future of science or its impact on philosophy, religion, politics, or the economy. Such conversations were for the elite; the doers; the movers; the people who were trying to make a difference in the world. Grisewood explained this point in some detail in his 1951 anniversary address, and in so doing gave an indication of where science fitted into his vision for the Third:

Our community – any community, surely – depends for a great deal upon the people who care very much. It is these, whose study and concentration bring us *the discoveries and inventions*, the great works of art, the clarification of ideas, and the maintenance in our changing world of the values we want to see maintained though cannot see how. It is for such as these that the Third Programme exists. These are the people who contribute to it, by listening as much as by appearing in the programmes. I would emphasise that. I mean the people who are prepared to make unusual efforts to understand better not only what they are trying to do themselves but what others are trying to do, too. It is a world of effort, of course, and that is why sometimes it is difficult. It is a world where

¹⁴³ Audience Research Department, “The Third Programme: The Size and Character of Its Public.”

¹⁴⁴ “Programme C Terms of Reference.” Cited in Carpenter, *The Envy of the World*, 12.

everything matters very much, and that is why it seems formidable. So the *place* that is kept for it in broadcasting depends ultimately upon this: upon what room society itself will allow to the kind of effort and communication needed by those who take the greatest pains to understand.¹⁴⁵

The BBC was not necessarily dismissive of other social classes – there was, after all, also the Light and Home and as will be seen in the next chapter, in its approach to science programming the BBC saw its three networks as corresponding to a three-way stratification of the audience – but the Third was clearly envisioned as a service for those elite members of society who were making an effort to aid the community. As such, the Third was contributing to a national debate amongst the country’s elite. What is also clear from Grisewood’s comments is that despite scientists’ accusations to the contrary, the Third felt that scientists had a crucial part to play in that debate. As long as scientists did not patronize the station’s elite listeners, the Third Programme was willing to allow scientists on air largely on their own terms.

¹⁴⁵ Grisewood, “The Place of the Third Programme,” 542. Emphasis added.

Chapter 6:

Ten Years On

“[T]he series now well known as ‘Science Survey’”, wrote *Nature* in its ‘News and Views’ section on 30 January 1954:

... has proved to be a remarkable achievement. Sir Edward Appleton said at the British Association meeting at Liverpool in 1953 that: ‘You have not really got to the bottom of the matter yourself if you cannot explain it to the man in the street’; Dr. Clow has always seemed to bear this in mind when selecting his speakers for Science Survey. Nevertheless, he has also always insisted on substance in these broadcasts and an absence of ‘talking down’ to the listener.¹

The unidentified author of this article had – perhaps unknowingly – hit upon the main struggle for Archie Clow during his first decade in charge of *Science Survey*: ensuring that the BBC’s flagship science series was prestigious and respected enough to attract elite scientific talent, while also being engaging and intelligible enough to appeal to listeners. As far as them *Nature* was concerned, Clow had succeeded on this front. Indeed, the article made a point of thanking Clow for his “careful preparation and handling” of scientific speakers over the years, and his helpful instruction in how to “hold the interest” of listeners.² It was here, the article noted, that Clow had “revealed a genius for production.”³

The article also called attention to the fact that the coming broadcast on 4 February (‘The Language of Badgers’ by the naturalist and frequent broadcaster Eric Simms) would be the 250th *Science Survey* talk produced by Clow. “It is good, therefore”, wrote *Nature*, “to have the opportunity on this 250th anniversary to congratulate Dr. Clow on his excellent work on scientific exposition and interpretation through the medium of radio.”⁴

¹ “The B.B.C. ‘Science Survey’: Dr. Archie Clow,” *Nature* 173, no. 4396 (January 30, 1954): 192.

² “The B.B.C. ‘Science Survey’: Dr. Archie Clow,” 192.

³ “The B.B.C. ‘Science Survey’: Dr. Archie Clow,” 192.

⁴ “The B.B.C. ‘Science Survey’: Dr. Archie Clow,” 192.

Within those 250 broadcasts, Clow had managed to bring over 250 different speakers to the *Science Survey* microphone and had overseen nearly 70 hours of programming.⁵ What is more, the series had regularly attracted an audience of over three quarters of a million people despite being placed at 10:30 in the evening – just half an hour before the nightly Home Service sign off.⁶ The magnitude of these accomplishments was not lost on Clow. “What printed journal, popular or otherwise, can compare with this?” he asked in a 1953 article in the *Journal of the Royal Institute of Chemistry*.⁷ In fact, as early as 1949 – less than three years into what would turn out to be two decades in charge – Clow was already drawing attention to the unprecedented longevity of the series. “[I]t may interest you to know”, he wrote to Edward Appleton on 21 October 1949, “that by [December] I shall have produced my 100th Science Survey – a record of continuity in science broadcasting never, I believe, achieved before.”⁸

Despite a difficult transition, then, by the mid-1950s Clow would seem to have molded *Science Survey* into a long-running series that was popular with scientists, listeners, and BBC management alike. He was not able to make all the changes that he might have hoped to make, however. Nor, as has been seen, was *Science Survey* the only science series on the air during this period. Understanding what Clow managed, and did not manage, to accomplish with the wide range of programmes he produced during his first decade at the BBC requires situating his work within the wider field of science programming on BBC radio during these years. As the previous chapters have shown, for Clow, producing science broadcasts for the different BBC networks had meant negotiating different expectations over the extent to which scientists should have unmediated access to the airwaves. It also meant choosing between the conflicting priorities of producing authoritative broadcasts, on the one hand, or comprehensible broadcasts, on the other. This chapter first considers how Clow navigated these expectations over the course of his first ten years as producer of *Science Survey*; it then considers where Clow’s overall output over this decade sat within the BBC’s science programming as a whole and how this reflected the nature of the BBC’s tripartite system.

⁵ Though *Science Survey* debuted as a thirty-minute series featuring two speakers, by the autumn of 1947 it had been trimmed to 15 minutes leaving time for just one speaker.

⁶ Archie Clow to C.T., “Press Conference - Notes on Science Survey,” Memorandum, (January 30, 1956), R51/971/1, Written Archives Centre.

⁷ Archibald Clow, “Chemistry on the Air,” *Journal of the Royal Institute of Chemistry* 77 (January 1, 1953): 574.

⁸ Archie Clow to Edward Appleton, Letter, (October 21, 1949), RCONT1 Appleton, Edward (1946-1954), Written Archives Centre.

6.1. A ‘scientific impresario’

On the night of 21 March 1956 Clow attended a conference at Senate House Library organized by the London sections of the Institute of Biology, Royal Institute of Chemistry, and Institute of Physics. The conference, entitled ‘The Presentation of Science to the Public’, had arisen – according to the conference report – out of an awareness that it was becoming “increasingly important that members of the public should understand in general terms what the scientists are doing and how the results of their work are likely to affect daily life.”⁹ As the producer of *Science Survey*, Clow had been invited to speak on “the presentation of science by sound radio” alongside A.W. Haslett and James McCloy who were to speak on science writing and science television, respectively. Had Clow’s audience read his memorandum on the future of *Science Survey* a decade prior, they might have been surprised at the contents of his talk that night. In 1946 Clow had argued that elite scientists often made for terrible broadcasters, and had campaigned for greater freedom to use ‘competent publicists’ on the Home Service; by 1956 he had come to accept Grisewood’s 1946 rebuttal that the role of a producer of science talks was not to find “‘popularisers’ who would attractively display the work of others”, but was to help scientists themselves be “interesting and simple”.¹⁰ The Archie Clow who spoke to the audience that March night in 1956 was far removed from the Archie Clow who had campaigned so fiercely for a total reformulation of the BBC’s approach to science programming a decade earlier.

Clow began the proceedings that night by explaining that as far as sound broadcasting was concerned, there were two ways of educating the public about science: via the feature programme, and via the straight talk. When developing a science feature, Clow explained, BBC producers had the freedom to write their own scripts and develop scientific material “at second hand, as it were”, but when developing a science talk, the BBC had “an obligation to present the scientist himself: to bring the authority to the microphone and present him to the public.”¹¹ As early as 1950, in fact, Clow could pronounce himself “firmly convinced” that *Science Survey* “should continue mainly through the use of scientists themselves”.¹²

This was in keeping with Talks department policy as a whole during this period. As George Barnes, Director of the Spoken Word, explained at a meeting of the General Advisory Council on the fourth of July, 1949:

⁹ “The Presentation of Science to the Public,” 437.

¹⁰ Grisewood to Rendall, “Observations by Dr. Clow.”

¹¹ “The Presentation of Science to the Public,” 437.

¹² Archie Clow to A.C.T., “Science Survey,” Memorandum, (May 23, 1950), R51/533/3, Written Archives Centre.

The purpose of Talks Department's work is to keep the public informed of developments in those departments of knowledge which can be made interesting to listeners through sound broadcasting and this is done by the producer finding the most appropriate and authoritative speaker on the subject selected.¹³

In fact, when, at around the same time, the Anderson Committee had pressed for the adoption of a 'science commentator' similar to Clow's 'competent publicist', BBC management rejected the suggestion for the same reason they had rejected Clow's proposal three years prior. In a meeting on 16 August 1949, Sir Lawrence Bragg had "put in a strong plea" for the BBC to employ a "science commentator" who would "go round institutions and universities to see what was going on and then tell the world what he had seen."¹⁴ What the Committee eventually recommended were "news commentaries" about science "similar to commentaries on political and economic affairs."¹⁵ Just as Clow had assured management in 1946 that there were many non-radiogenic scientists who would welcome the opportunity to supply material for radio broadcasts so long as the programmes were "skilfully and sincerely handled by a competent publicist",¹⁶ Bragg signaled that he and his colleagues would welcome the chance to collaborate with the BBC provided the person chosen as science commentator would "handle the material supplied with intelligence and enthusiasm."¹⁷

The suggestion was eventually circulated to a number of high-ranking BBC officials, one of whom responded by contrasting the approach of *Science Survey* with that of *This Surprising World*, a popular fortnightly science series during the early 1930s that had been fronted by the historian and theologian, Gerald Heard.¹⁸ In making the comparison, the unnamed author highlighted one of the main differences between science programming on BBC radio during the post-war period compared to the inter-war period. "We have often considered the relative merits of the Gerald Heard regime and our present policy in *Science Survey*", the author explained:

I think undoubtedly a pleasant radio personality with a reasonably good scientific background broadcasting week after week would build up a larger audience than we should ever get for *Science Survey*. But the authority of the broadcast would be much

¹³ G.R. Barnes, "Broadcasts on Science - Notes by Mr. G.R. Barnes," July 4, 1949, R6/34, Written Archives Centre.

¹⁴ "General Advisory Council: Special Sub-Committee to Consider Broadcasts on Science - Minutes of a Meeting on 16th August 1949," August 16, 1949, R6/34, Written Archives Centre.

¹⁵ John Anderson, "General Advisory Council: Special Sub-Committee to Consider Broadcasts on Science - Report," November 23, 1949, 2, R6/34, Written Archives Centre.

¹⁶ Clow, "Observations on *Science Survey*."

¹⁷ "GAC: Minutes of a Meeting on 16th August 1949."

¹⁸ See Jones, "Speaking of Science," 103–5.

less. Over the last few years, we have interested in broadcasting the majority of the big names in science. [...] For my part I doubt if I should listen to Science Survey if it were taken over by a Gerald Heard, and no longer given by scientists of the top grade.¹⁹

Thus, once again, authority and prestige trumped other considerations – this time the possibility of attracting a larger audience for science broadcasts by engaging a ‘science commentator’.

This policy of relying on scientists to inform the public effectively nullified Clow’s other major argument in his 1946 memorandum – namely that the inability of scientists to deliver engaging yet informative programmes placed the BBC “in a responsible position with regard to the dissemination of information about science.”²⁰ By 1956 Clow had come to accept R.A. Rendall’s 1946 assertion that the duty of the BBC was not to disseminate information about science on its own, but was to persuade “scientists themselves to shoulder the major responsibility of informing the public about scientific developments.”²¹ During his talk at the 1956 conference at Senate House, Clow took time to describe his role as a science producer at the BBC: “the presentation of science *through the medium of the scientist himself* is my problem – and being presented that of the scientist.”²² Later he went so far as to describe himself as a “scientific impresario”²³ – an impresario whose art-form was science talks rather than Italian opera or rock music, and who was in charge of a radio recording studio rather than an opera house or music hall. As such, by the mid-1950s Clow envisioned his role in the Talks department of the BBC not so much as the *creation* of art, but as the identification and cultivation of talented artists.

Clow’s job was to stay abreast of developments in science that were likely to be of interest to listeners, identify authoritative scientists working in those fields who were capable of producing a satisfactory talk, entice those scientists to make an appearance in *Science Survey* (or on the Home Service or Third Programme more generally), prepare them for the broadcast, advertise the performance, and attract an audience. Clow could advise scientists as to the presentation of a science talk – e.g. the structure, the language, the overall style – and might even exert an element of control over the framing of that talk – e.g. ideas to stress, lines of argument to take – but the actual content of that talk would be left almost entirely to the scientist. Indeed, though Clow explained to his audience at the conference that “the best broadcasts are the

¹⁹ Unknown Author (but initials appear to be B.M.H.) to C.H.S., “Some Comments on Report of Sub-Committee of G.A.C. on Science Broadcasting,” Memorandum, (December 19, 1949), R6/34, Written Archives Centre.

²⁰ Clow, “Observations on Science Survey.”

²¹ Rendall to Grisewood, “Observations by Dr. Clow.”

²² “The Presentation of Science to the Public,” 437. Emphasis added.

²³ “The Presentation of Science to the Public,” 437.

products of close co-operation between scientist and producer”, he clarified that in such an effort, “the facts are the responsibility of the scientist: the treatment is open to discussion.”²⁴ Thus, in programmes such as this, the BBC ceded control over the ‘facts of science’ to scientists themselves.

Of course, opting to use scientists to deliver information about advances in their own fields did not restrict the BBC’s science programming to lecture-style talks – science producers could have opted for discussions or interviews, for instance – but, as Clow explained at the same conference, the Talks department’s emphasis on the facts of science led “naturally” to talks, “since the question of opinion, the mainstay of discussion, does not enter very often.”²⁵ Throughout this period, then, Clow’s role within *Science Survey* was not to develop programmes that would interpret science, deliver ‘background information of science’, or explain the hidden biases and complications woven throughout a science-related issue; rather, it was to provide a platform from which scientists could inform listeners about important developments as they saw fit. Clow could, naturally, still frame the content of *Science Survey* through his choice of speaker and could exert a measure of control over the final talk by offering suggestions on a scientist’s initial drafts, but compared to *Science & Everyday Life* – throughout which he had been able to structure each six-week series around a lesson he hoped to impart – Clow’s role within *Science Survey* was less about interpretation, explanation, or mediation, and more about presentation.

6.2. *Elite scientists still made for terrible broadcasters*

Though Clow appears to have largely accepted management’s directive to utilize scientists rather than a ‘competent publicist’ or a ‘scientific commentator’ like Gerald Heard, Clow’s first decade in the Talks department did little to dissuade him of his belief that elite scientists often made for terrible broadcasters. In 1949 Clow penned a report on “the work of a producer of talks on science” in which he explained that although the world of science was “becoming aware of the importance of presenting its results for lay consumption”, the average scientist’s ability to write “imaginatively” or “perform in the studio” was “still very far from being developed as one would like.”²⁶ Scientists, he explained later, “are not conspicuously good broadcasters and not infrequently the presentation of a broadcast calls for line by line

²⁴ “The Presentation of Science to the Public,” 438.

²⁵ “The Presentation of Science to the Public,” 437.

²⁶ Archie Clow, “General Advisory Council: Organising Science Broadcasts - A Note by Dr. Clow on the Work of a Producer of Talks on Science,” GAC: Organising Science Broadcasts, July 1949, R6/34, Written Archives Centre.

production.”²⁷ Clow’s report was so critical of scientists in this regard, that when George Barnes suggested submitting it as evidence to the Anderson Committee, Barnes felt the need to include a parenthetical apology on Clow’s behalf: “(since it was written for another purpose it is in places very frank about scientists, and I hope this will be forgiven in view of the fact that Clow himself is a scientist)”.²⁸ Seven years later at the Senate House conference, Clow could still write that although there was “a fair chance of getting a reasonable broadcast from almost any speaker, provided that his response to production is intelligent”, it was nonetheless “an unhappy thought that many scientists almost boast that they never listen to talks.”²⁹ “Some of their writing”, he quipped, “suggests that neither do they read!”³⁰

As Clow explained in a 1956 memo to John Green, Controller (Talks), the Talks department’s policy of relying upon scientists had led “to occasional failures through scientists’ inability to communicate their ideas”.³¹ Clow therefore placed the blame for unsuccessful broadcasts on scientists themselves. This was, of course, very different from the opinions of Christopher Holme and Mary Somerville who, as detailed in the previous chapter, had envisioned misunderstandings between scientists and their audience as problems of translation and reception, respectively.

Having made his dissatisfaction with eminent scientists well known, Clow was able to strike a compromise of sorts with management: he would utilize scientists rather than competent publicists or interpreters, but would only use those scientists who were willing to work diligently at the art of broadcasting. Indeed, in 1949 the unnamed BBC official who rejected Bragg’s plea for a ‘science commentator’, nonetheless admitted:

There are, of course, times when Clow has to say to himself ‘X is really the right man to give a talk on this subject, but as a broadcaster has a poor manner and a dull voice. We’ll get Y instead’ [...].³²

²⁷ Clow, “General Advisory Council: Organising Science Broadcasts - A Note by Dr. Clow on the Work of a Producer of Talks on Science.”

²⁸ G.R. Barnes to H.S., “G.A.C. Science Sub-Committee,” Memorandum, (July 29, 1949), R6/34, Written Archives Centre.

²⁹ “The Presentation of Science to the Public,” 439.

³⁰ “The Presentation of Science to the Public,” 437.

³¹ Clow to C.T., “Press Conference - Notes on Science Survey.”

³² Unknown Author (but initials appear to be B.M.H.) to C.H.S., “Some Comments on Report of Sub-Committee of G.A.C. on Science Broadcasting.”

This was a subtle but impactful departure from Grisewood's 1946 assertion that Clow should use "only the very best authorities", even if they did sound "rather stuffy".³³ If it came down to a decision between a non-radiogenic president of a prestigious society and a radiogenic lower-level researcher, Clow had the leeway to extend an invitation to the less eminent – and more than likely less well-known – researcher.

Clow also managed to convince management to let him prioritize subject matter over the prestige of the speaker. "Throughout these years emphasis has always been on the subject and its contemporary value", he explained to management in 1950, "and the selected subject has always been presented through the best available scientist."³⁴ Depending on the subject chosen, the 'best available scientist' might happen to be the head of a research lab with quite a bit of name recognition, but it might also be an early-career researcher of whom listeners were unlikely to have heard. As a result, many of the scientists that appeared in *Science Survey* over its first decade were relative unknowns who spoke on what Clow took to be important but 'under the radar' research. For instance, on 15 December 1949 Clow invited J.B. Collins and H.J. Hodges to discuss their wartime investigations into "the problems of underwater photography" ('Report from the Sea Bed').³⁵ Collins, an engineer by training, detailed the workings of an underwater cine-camera, while Hodges, a "war-time frogman diving expert"³⁶ detailed what it is like to photograph peripatetic sea creatures two hundred feet below the surface of the sea. This appears to have been the only broadcast for both men – not just within *Science Survey*, but across BBC radio as a whole.

In 1950 Clow sought to assure management that this policy had not led to a drop in the standard of broadcasts:

Admittedly the use of so many untried speakers – selected because no other was available to deal with the topic under consideration – makes risk of failure inherent in the policy, yet only twice over a very long period has this policy led to criticism of the programme on this score alone.³⁷

³³ Grisewood to Rendall, "Observations by Dr. Clow."

³⁴ Clow to A.C.T., "Science Survey."

³⁵ "Science Survey," *The Radio Times*, no. 1365 (December 9, 1949): 34.

³⁶ J.B. Collins and H.J. Hodges, "Report from the Sea Bed," Microfilm Script, *Science Survey* (BBC Home Service Basic, December 15, 1949), 2, Radio Talks Scripts Pre-1970 (Film T464), Written Archives Centre.

³⁷ Clow to A.C.T., "Science Survey."

Far from being concerned, it would appear management recognized and appreciated Clow's ability to identify and recruit untapped new talent. For instance, when Chief Producer, Talks Department saw P.B. Medawar's script for what would be the biologist's first ever radio talk,³⁸ he wrote to Clow to commend him for once again unearthing a new talent. "I think you deserve congratulations for another discovery", he wrote on 2 December 1948.³⁹ Medawar would go on to appear in over 100 broadcasts across BBC radio and BBC television, and would deliver the Reith Lectures on BBC radio in 1959.

Because of these two policy changes – namely, emphasizing the subject matter rather than the speaker and selecting radiogenic scientists rather than prestigious scientists – Clow was able to avoid relying on a small cadre of well-known scientists – something he had cautioned management against in his 1946 memorandum on the future of *Science Survey*.⁴⁰ In 1950 Clow explained: "even after four years of the 32 recent speakers in Science Survey 22 were making their first microphone appearance there."⁴¹ Thus, whereas a few scientists appeared multiple times in the decade after Clow took over control of the series – e.g., Edward Appleton (9 talks), PMS Blackett (5 talks), and O.R. Frisch (4 talks) – far more appeared only once. Over the 21-year run of the series, over 700 different speakers appeared on *Science Survey* – of which over 550 made only one appearance. The sheer number of scientists that agreed to appear in *Science Survey* during this period paints a picture of a scientific community that was willing and interested in communicating their research on BBC radio.

6.3. 'between two stools'

Despite these changes, one fundamental aspect of the *Science Survey* remained in need of clarification, mirroring the debates about science programming on the Third: namely the audience to whom the series was meant to appeal. In his 1946 memorandum on the future of *Science Survey*, Clow had criticized Ian Cox for failing to clarify whether the series was aimed at scientists or non-scientists – a confusion which, in Clow's mind, had prevented the series from appealing to either audience. Six years later, in the lead up to the start of the 1952 season, Mary Somerville criticized Clow's version of the series for the same lack of clarity. "My recent review", she wrote on 15 September 1952:

³⁸ P.B. Medawar, "Skin Banks," Radio Broadcast, *Science Survey* (BBC Home Service Basic, January 6, 1949).

³⁹ Handwritten note on Archie Clow to Chief Producer, Science Talks, "Attached Script on Skin Banks," Memorandum, (December 1, 1948), RCONT1 Medawar, P.B. (1948-1957), Written Archives Centre.

⁴⁰ Clow, "Observations on Science Survey," 2.

⁴¹ Clow to A.C.T., "Science Survey."

... suggests that the series may appear to fall between two stools. Is it to attract the general public without much scientific education, or mainly the ‘other scientists’, particularly the up and coming, or what? [...] This needs threshing out.⁴²

Somerville’s critique was quite astute, for Clow’s writings during this period suggests that he was indeed attempting to fashion *Science Survey* into a series that would appeal to both audiences.

Two memos written by Clow during this period are particularly informative. The first, drafted in May 1950, was written at a time when *Science Survey* had apparently “been singled out [...] as ripe for suppression.”⁴³ In order to argue the case for *Science Survey*, Clow drafted a memo laying out the purpose, impact, and value of the series, which he submitted to the Assistant Controller (Talks) on 23 May 1950.⁴⁴ The second memo, drafted in January 1956, was written at a time when BBC radio was preparing to introduce a fourth network (confusingly titled ‘Network Three’), and was therefore reviewing how to best redistribute its current slate of science programming.⁴⁵ These memos are informative, both because of what they say, and what they do not say – because of what Clow chose to stress about the series, and what he left unwritten. They show a producer conscious of what is expected of him and of *Science Survey*, and therefore conscious of how to best sell the series to management in order to justify the continuation of the series.

On the one hand, Clow continued to try to insert into *Science Survey* elements of his functionalist, historical-contextual approach to science broadcasting in order to educate non-scientists about the beneficial impact of science on society. In the 1950 memo, Clow described *Science Survey* as a series that sought “to inform [listeners] about contemporary developments in the world of science and the ways in which these developments influence them.”⁴⁶ In justifying the continuation of the series, Clow stressed the valuable service that the series was providing for listeners:

⁴² Mary Somerville to Archie Clow, “Science Survey,” Memorandum, (September 15, 1952), R51/533/3, Written Archives Centre.

⁴³ Clow to A.C.T., “Science Survey.”

⁴⁴ Clow to A.C.T., “Science Survey.”

⁴⁵ Clow to C.T., “Press Conference - Notes on Science Survey.”

⁴⁶ Clow to A.C.T., “Science Survey.”

There is no other publication that I know of working at that level which week in week out keeps the eye on the contemporary and sometimes topical developments in science and helps to provide an understanding of the forces at work.⁴⁷

During his first decade in charge, Clow regularly included programmes that detailed the social benefits of scientific research and that therefore would have fitted nicely within *Science & Everyday Life* ('Our Water Supplies' in 1947;⁴⁸ 'Power from the Wind' in 1950;⁴⁹ 'Science & House-Building' in 1953;⁵⁰ 'Food for the Future' in 1956⁵¹). Clow was so confident that *Science Survey* was helping to inform non-scientists about the importance of science, that in his 1953 article in the *Journal of the Royal Institute of Chemistry*, he described the series as "a layman's 'Nature of the Air'"⁵² and mused:

This activity going on week after week must of its nature be exerting a powerful unseen influence towards understanding the general scientific temper of our time, and I think it something profoundly satisfying that late in the evening on most Thursdays in the year⁵³ something of the order of a million people are listening to the leading scientists of Britain [...].⁵⁴

Such a large audience, according to Clow, meant that "if every scientist in the country listened, between ten and twenty other listeners without scientific training beyond anything learned at school would be listening with him."⁵⁵

On the other hand, at the time Clow made this statement in 1953, the BBC's flagship science series was officially directed not at 'laymen', but at scientists. When *Science Survey* was 'singled out as ripe for suppression' in 1950, the Home Service discussed various ways the series might be improved in order for it to have a "greater impact".⁵⁶ The minutes of a "special departmental meeting on Home Service plans" on 22 June 1950 record that Controller, Home Service, brought up for discussion whether *Science Survey* might be better directed at a general

⁴⁷ Clow to A.C.T., "Science Survey."

⁴⁸ "Our Water Supplies," Radio Broadcast, *Science Survey* (BBC Home Service Basic, June 11, 1947).

⁴⁹ "Power from the Wind," Radio Broadcast, *Science Survey* (BBC Home Service Basic, March 2, 1950).

⁵⁰ "Science and House Building," Radio Broadcast, *Science Survey* (BBC Home Service Basic, January 1, 1953).

⁵¹ "Food for the Future," Radio Broadcast, *Science Survey* (BBC Home Service Basic, July 5, 1956).

⁵² Clow, "Chemistry on the Air," 574.

⁵³ *Science Survey* was broadcast on Thursday evenings during this period.

⁵⁴ Clow, "Chemistry on the Air," 578.

⁵⁵ Clow, "Chemistry on the Air," 574.

⁵⁶ Chief Producer, Talks, "Special Departmental Meeting on Home Service Plans - 21.6.50," June 22, 1950, R51/234/1, Written Archives Centre.

audience rather than a specialized one, and whether it might benefit from greater leeway to include the “occasional interview”, and use “interpreting publicists rather than experts.”⁵⁷ Eleven days later, however, Controller, Talks explained the brief for the series at which point it was agreed that *Science Survey* should continue to be “directed to scientists in other fields, or those ‘on the fringe’”.⁵⁸

Thus, whereas the Third Programme resisted scientists’ calls to mount programmes directed specifically at scientists – i.e. ‘science for scientists’ – *Science Survey* had long directed itself at ‘scientists in other fields’. The difference was that Lines, Morgan, and Oliphant had asked for technical science talks presented ‘in the terms accepted by scientists’,⁵⁹ whereas, according to the Home Service minutes, talks in *Science Survey* were to be “in the nature of the leading article in ‘Nature’ rather than a technical contribution to that paper.”⁶⁰ It was not until January 1955 that *Science Survey* was granted an earlier broadcast slot that would, in the words of Controller, Home Service, enable the series to “attract a non-expert audience.”⁶¹ This new placement did not relieve Clow of the need to appeal to scientists, however, for the earlier placing was meant to expand the audience for the series rather than shift it from scientists to non-scientists. If anything, the earlier placement simply enabled Clow to be more up front about his efforts to make the series appeal to both audiences. It would not, however, have made the balancing act any easier; the difference in audience expectations would have become even more pronounced.

After four years of trying to meet the expectations of these disparate audiences, *Science Survey* was once again criticized for a lack of clarity about its intended audience – this time from J.A. Camacho, Head of Planning, Light Programme. After listening to the second of G.F.J. Garlick’s two talks on solid-state physics on 9 January 1959,⁶² Camacho expressed his view of the series to his counterpart on the Home Service:

⁵⁷ Chief Producer, Talks, “Special Departmental Meeting on Home Service Plans - 21.6.50.”

⁵⁸ Chief Producer, Talks, “Home Service Programme Board Meeting of June 30th 1950,” July 3, 1950, R51/234/1, Written Archives Centre.

⁵⁹ Morgan to The Director, BBC Third Programme, “Untitled.”

⁶⁰ Chief Producer, Talks, “Home Service Programme Board Meeting of June 30th 1950.”

⁶¹ Talks Organiser (Home Service and Light Programme Talks), “Home Service Minutes - 12 November 1954,” November 12, 1954, R51/234/4, Written Archives Centre. The series was moved from Thursdays at 22:30 to Thursdays at 19:00.

⁶² G.F.J. Garlick, “Imperfect Matter II: New Lamps for Old,” Radio Broadcast, *Science Survey* (Network Three, January 9, 1959).

I listened to Saturday's [...] broadcast and gained the impression that such listeners as there were could have been divided into two groups. Those who could understand but were told nothing new; and those to whom it was mostly new – but couldn't understand.⁶³

This was the eternal struggle of *Science Survey*.

In fact, throughout this decade many members of *Science Survey*'s audience appear to have picked up on the difficulty of appealing to these two disparate audiences with their markedly different expectations. The audience research report for a 1953 *Science Survey* broadcast 'The Science of Three-D' by Professor W.D. Wright, for instance, noted:

Most members of the reporting Panel agreed that the subject of 3-Dimensional films was an interesting one, but there was speculation about the audience for whom the talk was intended? A few members (knowledgeable on films) asserted that only people who already knew something of the subject would listen to the Professor, and that therefore he gave too much elementary detail.⁶⁴

At times listeners appear to have consigned themselves to the idea that the series would often 'fall between two stools', as Somerville had put it. A respondent to Patrick Johnson's 1948 *Science Survey* broadcast 'The Advent of the Gas Turbine', for instance, concluded: "I think the series has been too technical for the general listener, but probably not technical enough for scientists, but it is the best compromise possible."⁶⁵

This all raises the question: what was the ultimate goal of *Science Survey* during this first decade of the post-war period? Or, put another way: what was the value of *Science Survey*? Did BBC management deem it valuable because it fulfilled one of the BBC's three main responsibilities – education, information, entertainment – or for other reasons entirely? Though Clow clearly valued *Science Survey* for the positive impact he felt it was having on the non-scientists in the audience – the way it was helping 'laymen' understand something of the "general scientific temper of our time"⁶⁶ – the educational and informational value of the series was not what kept it on the air during this period. Throughout this period Clow and management placed

⁶³ H.P.L.P. to H.P.H.S., "Science Survey," Memorandum, (January 12, 1959), R51/971/1, Written Archives Centre.

⁶⁴ Audience Research Department, "Listener Research Report: 'The Science of Three-D' a Talk by Professor W.D. Wright," April 30, 1953, R9/6/13-16, Written Archives Centre.

⁶⁵ Audience Research Department, "Listener Research Report: 'Science Survey' (Week 22) Last of the Series - Thursday 27 May 1948," June 14, 1948, R9/68/12, Written Archives Centre.

⁶⁶ Clow, "Chemistry on the Air," 578.

much more emphasis on the fact that the series: 1) brought credit and prestige to the BBC; 2) helped bring the BBC and the world of science closer together by impressing scientists with the quality of the BBC's science programming; and 3) actively aided the world of science by facilitating communication between scientists.

These first two goals of the series have already been detailed in Chapter 4, and are therefore not surprising. As discussed previously, in 1946 Grisewood instructed Clow that management expected *Science Survey* to bring credit to the BBC, and to maintain and improve the BBC's "reputation for good judgement among the Science world."⁶⁷ Suffice it to say that ten years later Clow could happily report that the series had fulfilled these goals. "Practically every British Nobel Prize-winner has taken part", Clow boasted in his 1956 memo.⁶⁸ In the same memo he further stressed that even though the series had begun using non-eminent scientists over the past decade, *Science Survey*'s reputation for reliable and forthright statements on science had helped engender a "vast amount of goodwill between the Corporation and the world of science."⁶⁹

Compared to these first two goals of the series, the third has not been previously discussed, and is therefore perhaps more surprising. Nonetheless, it is clear that throughout his first decade in charge, Clow saw *Science Survey* as valuable in large part because it aided scientific research – despite the fact that in 1946 Clow had asserted that the goal of *Science Survey* and the BBC as a whole "should not be to tell one set of scientists what the other set is doing".⁷⁰ By 1950, however, Clow could write:

I doubt if it is wide of the mark to say that for many scientists Science Survey is their only regular contact with the science that exists outside their own narrow, specialised field. This may sound deplorable but I am certain that it is so.⁷¹

Six years later in his 1956 memo, Clow again stressed the impact the series was having on scientists. His third bullet point read:

⁶⁷ Grisewood to Clow, "Science Survey."

⁶⁸ Clow to C.T., "Press Conference - Notes on Science Survey."

⁶⁹ Clow to C.T., "Press Conference - Notes on Science Survey."

⁷⁰ Clow, "Observations on Science Survey."

⁷¹ Clow to A.C.T., "Science Survey."

Plays important part in current scientific life of country since it is much resorted to by scientists and technologists as a painless way of keeping in touch with what is going on in fields other than their own.⁷²

By that point in 1956 Clow was even in a position to offer tangible evidence of the ways that *Science Survey* was aiding science. Bullet point number nine read:

Sometimes has most unexpected impact. After recent Science Survey on Locusts one of the country's most distinguished nuclear physicists (not for publication: Sir William Penney) wrote to the speaker and offered to do calculations for him because he thought he saw a new way of tackling one of the problems mentioned in the broadcast.⁷³

This was one of Clow's favorite justifications for the series, for he often used it as a selling point when speaking directly to scientists. In his 1953 article in the *Journal of the Royal Institute of Chemistry*, for instance, Clow offered two ways of gauging the success of *Science Survey*: first by the size of the listening audience, second by the positive – and potentially lucrative – response from scientific circles:

Another mode of assessment – this time from the speaker angle – is that following a talk a speaker may receive as many as fifty letters reckoned by him to be useful. One speaker's 'bag' included seven letters from directors of research seeking information, another received requests from three leading publishers to expand his talk into a book.⁷⁴

Throughout this period one of the most consistent justifications Clow offered for the series was that it benefited science.

Perhaps surprisingly, Clow was not the only producer at the BBC during this period who was adamant that one of the BBC's goals should be to actively aid science. Throughout the autumn of 1949 Clow worked with a colleague at the BBC, T.B. Radley, to develop a series of talks and discussions which would explore the way that research on viruses, cancers, and enzymes had brought together researchers from once divergent fields of science. When Clow became too busy to pen the report himself – “He, poor wretch, has not had time to do his half”⁷⁵ – Radley stepped in to explain the thinking behind the series. “In doing this series of

⁷² Clow to C.T., “Press Conference - Notes on Science Survey.”

⁷³ Clow to C.T., “Press Conference - Notes on Science Survey.”

⁷⁴ Clow, “Chemistry on the Air,” 578.

⁷⁵ T.B. Radley to A.C.T., “Project: ‘The Challenge of Life’ Series,” Memorandum, (October 26, 1949), R51/596, Written Archives Centre.

broadcasts”, Radley explained to management, he and Clow hoped to help “the contributing scientists themselves to make a little further synthesis together than any of them might make separately.”⁷⁶ Radley then went on to explain his reasons for supporting such a series:

I would like to make my own belief clear: it is that broadcasting not only should, not only can, mirror this [trend towards the synthesis of scientific knowledge]; but that there is a reasonably good chance [...] of broadcasting having a sensible and weighty contribution to the present scientific trend and climate of opinion of its own to make. Perhaps I ought to say too that I’ve been thinking about this for over a year now.⁷⁷

Radley, like Clow, felt the BBC should seek to actively aid scientific research.

6.4. ‘the fabric of science broadcasting as a whole’

During his talk at ‘The Presentation of Science to the Public’ conference in 1956, Clow informed his audience that he had edited and produced “some 300-400 Science Surveys, and twice as many other programmes.”⁷⁸ Taking the average, then, Clow had produced somewhere in the range of 1,050 science programmes since joining the BBC in July 1945, giving an average of 98 talks per year.⁷⁹ These programmes, however, made up only a percentage of the science programmes broadcast by the BBC. *Science Survey*, *Science & Everyday Life*, and the Third Programme were not, after all, the only places wherein the BBC discussed scientific topics or examined issues related to science. Having taken the time to understand the changes Clow made to *Science Survey* during the first decade of the post-war period, as well as the ultimate value of the BBC’s flagship science series over these years, it is important also to understand where the series sat in relation to the rest of the BBC’s wide range of science programming.

Conveniently, one of the pieces of evidence the BBC submitted to the Anderson Committee in 1949 was a list of every BBC radio programme that mentioned or discussed a

⁷⁶ T.B. Radley to Archie Clow, “Project: ‘The Challenge of Life’ Series,” Memorandum, (October 28, 1949), R51/596, Written Archives Centre. Original emphasis.

⁷⁷ T.B. Radley to A.C.T., “‘The Challenge of Life,’” Memorandum, (November 4, 1949), R51/596, Written Archives Centre.

⁷⁸ “The Presentation of Science to the Public,” 437.

⁷⁹ Assuming Clow continued at this pace for the rest of his career, he would have produced close to 2,500 programmes during his quarter-century at the BBC.

scientific topic during the spring of 1949.⁸⁰ Although the survey covers only a short three and a half month period, it serves as a detailed cross-section of the BBC's science programming and therefore makes it possible to outline a few general rules about how the BBC approached science programming during this period, and how the Corporation distributed its science programming within its tri-part pyramid.

The survey listed 85 radio programmes broadcast on the BBC's national and regional services,⁸¹ 40 schools educational radio broadcasts, and 3 television broadcasts,⁸² for a grand total of 128 broadcasts on science – an average of more than one per day.⁸³ This amounted to “approximately 7.5% of the time devoted to talks and discussions for listeners in the United Kingdom and for about 4% of the time devoted to feature programmes” – a figure which the Anderson Committee regarded as “impressive”.⁸⁴

Not including the schools broadcasts, the BBC had broadcast 61 original programmes on its home services – i.e. the Light, Home, and Third – of which 24 (39%) were broadcast as part of either *Science Survey* (10), or *Science & Everyday Life* (14).⁸⁵ Another 17 (28%) were broadcast on the Third Programme.⁸⁶ Considering the Third had a standing order for a fortnightly science talk from Clow at this time, it can safely be assumed that over these three and a half months Clow produced roughly seven talks for the Third. Taken together, then, Clow likely produced just over half (31) of the 61 original science programmes broadcast on the home services during this period.

Included within the other 30 broadcasts were a number of science programmes produced by long-serving and noteworthy producers. Alongside the 14 installments of *Science & Everyday Life*, the Light Programme had aired four, half-hour science features as part of the series

⁸⁰ “General Advisory Council: List of Science Broadcasts Prepared at the Request of the Sub-Committee at Their Meeting on 27 June 1949,” June 27, 1949, R6/34, Written Archives Centre. The survey covered the three and half months from 19 March to 30 June 1949.

⁸¹ Of the 85 radio programmes broadcast on the regional and national services, 10 were repeats or shortened versions of previously aired programmes.

⁸² The list of television broadcasts only covered the period from 14 May to 30 June rather than 19 March to 30 June. The list offered no explanation for why a shorter period was chosen.

⁸³ “GAC: List of Science Broadcasts.”

⁸⁴ Anderson, “GAC: Report,” 1. This tally was based on total *time* devoted to science, not just number of broadcasts.

⁸⁵ The total of 61 original programmes does not include repeats or shortened versions of previously aired programmes, nor does it include programmes broadcast on the BBC's regional services.

⁸⁶ The survey lists one broadcast of *Science & Everyday Life* as originating on the Third Programme, but the *Radio Times* shows that the broadcast in question originated on the Light Programme, and has therefore not been included in the tally of Third Programme broadcasts.

New Horizons. The six-part series, produced by Nesta Pain, explored recent research in areas like public health, brain research, and astronomy, and featured dramatizations, recordings of research in progress, and narrative structures that epitomized science features on BBC radio during this period. The second installment, ‘The Brain at Work’,⁸⁷ for instance, included a description of research in action:

New methods make it possible to study the brain in action. This programme shows something of how this is done and includes a broadcast of ‘brain-waves’ recorded in the laboratory and a running commentary on an octopus undergoing memory training.⁸⁸

The fourth installment, ‘Hidden Death: A Study of a Typhoid Outbreak’,⁸⁹ on the other hand, took the form of a detective mystery that strove to illustrate the importance and necessity of typhoid research:

The investigation of a typhoid outbreak has much the same detective interest as the investigation of a murder, and even greater urgency since typhoid may number its victims in hundreds. This programme treats an actual outbreak on the lines of a detective story without any sacrifice of scientific accuracy.⁹⁰

The series was able to ensure this scientific accuracy, the *Radio Times* asserted, because the series had employed Sir Henry Dale as ‘General Scientific Advisor’, and featured short commentaries by scientists directly involved in the research under discussion each week.⁹¹ The actual concepts and scripts, however, were developed either by Pain herself, or by professional scriptwriters within the BBC.

The 1949 survey submitted to the Anderson Committee also included four Home Service broadcasts of the natural history series, *The Naturalist*. The series dealt with everything from dragonflies,⁹² ducks,⁹³ and dinosaurs⁹⁴ to woodpeckers,⁹⁵ wasps,⁹⁶ and water voles,⁹⁷ and

⁸⁷ “The Brain at Work,” Radio Broadcast, *New Horizons* (Light Programme, March 8, 1949).

⁸⁸ “New Horizons,” *The Radio Times*, no. 1325 (March 4, 1949): 15.

⁸⁹ “Hidden Death: A Study of a Typhoid Outbreak,” Radio Broadcast, *New Horizons* (Light Programme, April 7, 1949).

⁹⁰ “New Horizons,” *The Radio Times*, no. 1329 (April 1, 1949): 19.

⁹¹ Edward Appleton, E.D. Adrian, and W.E. Le Gros Clark all served as advisors for individual episodes.

⁹² “Dragonflies,” Radio Broadcast, *The Naturalist* (BBC Home Service Basic, September 12, 1948).

⁹³ “Wild Duck,” Radio Broadcast, *The Naturalist* (BBC Home Service Basic, November 4, 1951).

⁹⁴ “Dinosaurs,” Radio Broadcast, *The Naturalist* (BBC Home Service Basic, February 19, 1956).

⁹⁵ “Woodpeckers,” Radio Broadcast, *The Naturalist* (BBC Home Service Basic, March 13, 1955).

⁹⁶ “Wasps,” Radio Broadcast, *The Naturalist* (BBC Home Service Basic, August 26, 1956).

⁹⁷ “Water Voles,” Radio Broadcast, *The Naturalist* (BBC Home Service Basic, August 28, 1955).

proved so popular after it debuted in January 1946 that it ran for over twenty years. The producer of the series, Desmond Hawkins, was one of the longest-serving producers of science programming during this period. In 1955 he would produce the successful natural history series, *Look*, for BBC television, and in 1957 would establish the now famous BBC Natural History Unit in Bristol.⁹⁸

The Naturalist was more than a collection of nature recordings or frolicsome descriptions of bird sightings. In fact the series billed itself as a “monthly programme of observation and science”.⁹⁹ In the preface for a book of collected essays by regular contributors to *The Naturalist* and *Look*, Hawkins explained his approach to natural history broadcasting on radio and television:

One of the surprising successes of modern broadcasting in Britain over the last ten years has been the type of wild-life programme in which a realistic and scientific approach replaces the old idea that the only way to present natural history is to be whimsical or arch or sentimental.¹⁰⁰

Natural history proved so popular with the BBC radio audience that *The Naturalist* was later joined by a number of other long-running nature series: *Birds in Britain*, a magazine programme dedicated to “the study and appreciation of British birds” (1951),¹⁰¹ and *Open Air* (1952).

Science was discussed in more than just these few explicitly scientific series, however. General interest series on BBC radio often discussed topics related to science. Indeed, in Clow’s 1953 article in the *Journal of the Royal Institute of Chemistry* he advised his readers that to “see in perspective” what the BBC radiated to listeners, one had to “knit together the threads of [the BBC’s] extensive output into the fabric of science broadcasting as a whole.”¹⁰² “Within the broad pattern made up of broadcasting as a whole”, he argued, “the Corporation is steadily building up a picture of science as a component part of human endeavour.”¹⁰³ As examples he pointed to: the BBC’s weather forecasts; gardening programmes; the music and performance series, *Musica Britannica*; the Home Service “public affairs” series, *Taking Stock*;¹⁰⁴ and the Light Programme

⁹⁸ Gouyon, “The BBC Natural History Unit: Instituting Natural History Film-Making in Britain,” 430–32.

⁹⁹ “The Naturalist,” *The Radio Times*, no. 1170 (March 1, 1946): 6.

¹⁰⁰ Desmond Hawkins, “Preface,” in *The BBC Naturalist*, ed. Desmond Hawkins (London: Rathbone Books, 1957), 7.

¹⁰¹ “Birds in Britain,” *The Radio Times*, no. 1427 (March 16, 1951): 20.

¹⁰² Clow, “Chemistry on the Air,” 573.

¹⁰³ Clow, “Chemistry on the Air,” 574–75.

¹⁰⁴ “Taking Stock,” *The Radio Times*, no. 1355 (September 30, 1949): 30.

serial drama (proto-soap opera?) *Mrs Dale's Diary* – in which the eponymous Mrs. Dale, the wife of a GP, recorded the “daily happenings” of the fictional London suburb Parkwood Hill.¹⁰⁵ Later Clow pointed to the daily news service *Radio Newsreel* and the topical series *Topic for Tonight* – the latter of which the *Radio Times* described as a series in which a panel of speakers would “sketch in the background of themes and events in or around the news”¹⁰⁶ – as examples of two Light Programme series that “not infrequently” carried “topics of current scientific interest”.¹⁰⁷ That this was a conscious programming decision by the BBC is shown by the fact that while it was expected that most scientific fare would be placed in *Science Survey* – Clow once referred to the series as “the principal vehicle of science broadcasting in the Home Service”¹⁰⁸ – Clow was nonetheless advised in June 1950 that any “major scientific discovery or process of general interest and importance” would be “eligible for consideration” as a stand-alone talk or as a topic to be discussed in *Questions of the Hour* – a Home Service series in which the major issues of the day were examined from multiple angles by a wide range of experts.¹⁰⁹

Knitting together the ‘threads of this extensive output’ over this entire decade, then, would be quite difficult. The time needed to conduct even a cursory examination of the *Radio Times* in order to identify each time a general interest or topical series discussed science during this period would be prohibitive. This is why the BBC’s 1949 survey of its science programming proves so valuable. Of the Light Programme or Home Service broadcasts listed in the survey, 12 were part of series not traditionally viewed as ‘science series’. For the Home Service, these consisted of: four broadcasts of *The World Goes By*, a personal interest series in which the radio and television personality Gilbert Harding interviewed “men and women who have something to tell about their jobs, their experiences, and their observations in the world about them”;¹¹⁰ three broadcasts of *The Eye Witness*, a “weekly programme of topical reports from Britain and overseas”;¹¹¹ two broadcasts of *Open on Sunday*, during which Geoffrey Boumphrey reported on his visits to national places of interest; and one broadcast of *In Britain Now*, a ‘national magazine’ in which contributors from across the UK discussed “some of the things that are going on in Britain now”.¹¹² For the Light Programme, these series consisted of: one broadcast of the aforementioned *Topic for Tonight*; and one broadcast of the extremely long-running series,

¹⁰⁵ “Mrs. Dale’s Diary,” *The Radio Times*, no. 1264 (January 2, 1948): 11.

¹⁰⁶ “Topic for Tonight,” *The Radio Times*, no. 1500 (August 8, 1952): 13.

¹⁰⁷ Clow, “Chemistry on the Air,” 573.

¹⁰⁸ Archibald Clow to O.G. Edholm, Letter, (January 22, 1957), RCONT1 Edholm, O.G., Written Archives Centre.

¹⁰⁹ Chief Producer, Talks, “Home Service Programme Board Meeting of June 30th 1950.”

¹¹⁰ “The World Goes By,” *The Radio Times*, no. 1336 (May 20, 1949): 12.

¹¹¹ “The Eye-Witness,” *The Radio Times*, no. 1276 (March 26, 1948): 14.

¹¹² “In Britain Now,” *The Radio Times*, no. 1310 (November 19, 1948): 14.

Woman's Hour, a magazine-style series billed as a “daily programme of music, advice, and entertainment for the home”.¹¹³

The wide range of general, topical, or ‘non-science’ series that discussed topics related to science during this period demonstrates the extent to which science was indeed woven into the broader programming of the BBC. Even the Anderson Committee was impressed with the BBC’s output. In its final report submitted in November 1949, the members of the committee noted that they had received “evidence of the large amount of ground that is already being covered by the BBC’s science broadcasts” – broadcasts which, the report explained, varied “widely in substance and weight”, and had gained substantial audiences for broadcasts “dealing with scientific subjects at various levels.”¹¹⁴ “These are not confined to any one of the alternative Programmes, Home, Light and Third” the report noted, “but are given in all three”.¹¹⁵

6.5. ‘coordinating science broadcasts over the whole field’

The inclusion of science programming within all three of the home networks meant that the BBC was applying some criteria, implicit or otherwise, to decide which science programmes belonged on which of its three services. For example, if a scientist approached the BBC with an idea for a programme on science, what guidelines helped the BBC’s producers and managers decide whether the programme should be placed on the Light, Home, or Third? And, having settled that, what guidelines helped them decide whether the programme should be presented as a feature, talk, discussion, interview, or magazine? Answers to these hypotheticals can be found in the BBC’s response to two experiments conducted as part of a Further Education department examination of listener comprehension.

The first study was directed by Joseph Trenaman in 1949, and took the form of an examination of listener reactions to *New Frontiers in Science* – a six-part series about the “present-day growth of science” broadcast in the summer of 1949 that was planned and produced by none other than Archie Clow.¹¹⁶ Allan Jones has examined the methodology and execution of this study in detail,¹¹⁷ so these need not be re-treaded here; what are important in the context of this thesis are the findings of the study. The second study was an examination of listener

¹¹³ “Woman’s Hour,” *The Radio Times*, no. 1201 (October 4, 1946): 11.

¹¹⁴ Anderson, “GAC: Report,” 1.

¹¹⁵ Anderson, “GAC: Report,” 1.

¹¹⁶ “New Frontiers in Science,” *The Radio Times*, no. 1344 (July 15, 1949): 22.

¹¹⁷ See Jones, “Speaking of Science,” 197–201.

reactions to 50 Forces Educational Broadcasts – of which 10 were broadcasts of *Science & Everyday Life* – conducted in 1950 by P.E. Vernon, Professor of Educational Psychology at the University of London.¹¹⁸ As will be seen, these studies helped shape the BBC’s conception of the different types of audiences for science programming, and, in turn, the BBC’s conception of the divergent needs and desires of each of these audiences.

In June 1949, Assistant Controller, Talks, approached the Further Education department with the idea of using Clow’s series, *New Frontiers in Science*, to “measure how much of the scientific fact and principle described in [the series] was understood by three categories of listeners of differing educational background in science.”¹¹⁹ The knowledge gained from such a study might, it was hoped, help the BBC solve what the final report referred to as “the problem of getting scientists to talk about science without making the assumption that all listeners had had a formal education in science.”¹²⁰ In an attempt to secure listeners from across the educational spectrum, the study selected guinea pigs from “seven educational levels”, described as:

... graduates, undergraduates, Grammar School Sixth Forms, Secondary Technical School Sixth Forms, City and Guild and National Certificate Students, Skilled Artisans or Amateurs generally interested in science and, finally, listeners with only elementary education whose occupation brings them into touch with some aspects of science.¹²¹

The original plan had been to examine each broadcast in the series, but due to scheduling complications Trenaman and his colleagues were only able to examine reactions to the first of the six broadcasts, a talk by the English physicist N.F. Mott on the discovery of electrons and their use in electronic devices.¹²²

When the results were tallied, the study appeared to identify three distinct levels of comprehension amongst listeners. According to Trenaman’s final report, the scientific facts and

¹¹⁸ P.E. Vernon, “The Intelligibility of Broadcast Talks,” November 1950, LR/50/2328, Written Archives Centre.

¹¹⁹ “Listeners’ Understanding of a Broadcast Talk on Science: An Enquiry under the Further Education Department,” October 1949, 1, R6/34, Written Archives Centre.

¹²⁰ “Listeners’ Understanding of a Broadcast Talk on Science: An Enquiry under the Further Education Department,” 1.

¹²¹ “Listeners’ Understanding of a Broadcast Talk on Science: An Enquiry under the Further Education Department,” 2.

¹²² N.F. Mott, “What Are We Doing with Electrons?,” Radio Broadcast, *New Frontiers in Science* (BBC Home Service Basic, July 19, 1949).

principles of Professor Mott's talk had been "sufficiently understood"¹²³ by a first group made up of graduates and undergraduates, "only partly understood"¹²⁴ by a second group ranging from Sixth Formers to National Certificate Students, and "hardly understood at all"¹²⁵ by a third group made up of skilled artisans, amateurs, and workmen. The report stressed, however, that follow-up discussion showed "an equally strong interest in broadcasts about science in all groups."¹²⁶ The challenge before the BBC, then, was to figure out how to capitalize on the interest of each of these groups without alienating large swaths of the rest of the audience in the process. Trenaman concluded:

... the problem of interesting the general public in science would appear to demand the provision of series of spoken word broadcasts at three different levels of difficulty; and here difficulty must evidently be measured in terms of assumptions made as to background education in science.¹²⁷

As Jones has shown, the BBC took these three "aggregated groupings of educational attainments" as approximations of the "typical educational attainments of audiences for the Third, Home and Light"¹²⁸ – a segmentation of the audience that had been anticipated by Mary Somerville some years earlier, albeit without empirical evidence.¹²⁹ The Anderson Committee made the same connection when it was shown a copy of the report. "This enquiry", noted the committee's final report, "seems to have an interesting bearing on the question of coordinating science broadcasts over the whole field covered by Home, Light and Third Programmes."¹³⁰

Trenaman's call for science programming at 'three different levels of difficulty' is somewhat misleading, however, for his report dealt as much with the presentation style needed to interest listeners in each of these three groups, as it did with the level of science content desired by each. In fact, Trenaman and his colleagues asked a number of these groups for their

¹²³ "Listeners' Understanding of a Broadcast Talk on Science: An Enquiry under the Further Education Department," 6.

¹²⁴ "Listeners' Understanding of a Broadcast Talk on Science: An Enquiry under the Further Education Department," 6.

¹²⁵ "Listeners' Understanding of a Broadcast Talk on Science: An Enquiry under the Further Education Department," 1.

¹²⁶ "Listeners' Understanding of a Broadcast Talk on Science: An Enquiry under the Further Education Department," 6.

¹²⁷ "Listeners' Understanding of a Broadcast Talk on Science: An Enquiry under the Further Education Department," 8.

¹²⁸ Jones, "Speaking of Science," 201.

¹²⁹ See Jones, "Speaking of Science," 145–49.

¹³⁰ Anderson, "GAC: Report," 2.

reactions to a dramatized science feature that had been developed as a schools broadcast (“The Discovery of X-rays”), and an FEB broadcast of *Science & Everyday Life* (“Soil and Microbes”)¹³¹ in order to “compare the degree of interest” between Mott’s lecture-style talk and “other forms of science broadcast”.¹³² According to Trenaman’s report, the first group (the graduates and undergraduates judged most likely to listen to the Third Programme) wanted:

... talks by speakers of [N.F.] Mott’s calibre, but written at a higher level – thus an undergraduate said ‘What a waste of time to put on Mott and get him explaining Newton’s theory of light; we want to hear what he is doing with the electron microscope’.¹³³

The second group (the Sixth Form and National Certificate students judged most likely to listen to the Home Service) “expressed interest in talks of this type” – i.e., lecture-style talks like Mott’s, delivered in an engaging style and aimed at a non-specialist audience.¹³⁴ The third group (the skilled artisans, amateurs, and workmen judged most likely to listen to the Light Programme) “expressed a strong preference for the Schools or F.E.B. type of broadcast”.¹³⁵ The report further noted that, for this third group, it did not “appear to be important [...] that the speaker should be distinguished in his field.”¹³⁶

The Anderson Committee appeared to agree with these findings, noting that while there was “clearly scope in the Third Programme for dealing with new developments in science, for the benefit of knowledgeable listeners”, and while such listeners appreciated “the opportunity of listening to the famous scientist in his own voice”, at the “other end of the scale [...] anything about science in the Light Programme needed to be very light indeed in order to gain a

¹³¹ Trenaman appears to have paraphrased both titles, for neither title corresponds to a programme broadcast by the BBC during this period. However, two programmes closely resemble the titles listed by Trenaman and therefore likely represent the programmes included in the study: “Röntgen and X-Rays,” Radio Broadcast, *For the Schools* (BBC Home Service Basic, October 19, 1949); Ashworth Underwood, “The Relation of Microbes to Disease,” Radio Broadcast, *Science and Everyday Life* (Light Programme, May 25, 1949).

¹³² “Listeners’ Understanding of a Broadcast Talk on Science: An Enquiry under the Further Education Department,” 7.

¹³³ “Listeners’ Understanding of a Broadcast Talk on Science: An Enquiry under the Further Education Department,” 7.

¹³⁴ “Listeners’ Understanding of a Broadcast Talk on Science: An Enquiry under the Further Education Department,” 7. Original emphasis.

¹³⁵ “Listeners’ Understanding of a Broadcast Talk on Science: An Enquiry under the Further Education Department,” 8. Original emphasis.

¹³⁶ “Listeners’ Understanding of a Broadcast Talk on Science: An Enquiry under the Further Education Department,” 8.

hearing”.¹³⁷ In a show of deference to the BBC and its broadcasting expertise, the scientists on the committee ceded control of programmes on the Light. “[S]uch broadcasts”, the committee’s report explained, “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.”¹³⁸

The Further Education experiment conducted by P.E. Vernon in 1950 came to similar conclusions. Though Vernon’s study analyzed the reaction of Army personnel to forces broadcasts on the Light (rather than civilian reactions to a general broadcast on the Home), his study adopted Trenaman’s three-way stratification of the audience. According to Vernon’s report, the study had set out to investigate the extent to which informational talks were “understood by representative groups of adults [and] by above average and by duller listeners”.¹³⁹ In a 1951 summary of the study in *Public Opinion Quarterly*, Robert Silvey, Head of Audience Research at the BBC, explained that the results of the study showed that “the talk which is couched at a level of difficulty appropriate to the top third of the population can rarely convey much to people of even average intelligence and little or nothing to the backward quarter.”¹⁴⁰

The results of this particular study not only appeared to identify a three-way stratification of the BBC audience, but to yield “some clues as to what interests average or below average audiences.”¹⁴¹ In a description that greatly resembles the expressed purpose and approach of *Science & Everyday Life*, Silvey attempted to define the actual content that Light Programme listeners desired. “The most interesting talks”, explained Silvey, “were those which dealt with concrete subjects of a practical kind which were familiar to listeners in their daily lives or which affected them personally.”¹⁴² With regards to science programming specifically, he noted: “Scientific *applications* are more interesting to listeners than scientific *theories*.”¹⁴³

The study was unable to offer advice on how to interest the top third of the population, but, like Trenaman’s report, Vernon concluded that the bulk of the “average and below average” and “dull and backward” adults needed programmes defined by “popularisation and

¹³⁷ Anderson, “GAC: Report,” 2.

¹³⁸ Anderson, “GAC: Report,” 2.

¹³⁹ Vernon, “The Intelligibility of Broadcast Talks,” 7.

¹⁴⁰ Robert Silvey, “The Intelligibility of Broadcast Talks,” *Public Opinion Quarterly* 15, no. 2 (January 1, 1951): 301.

¹⁴¹ Silvey, “The Intelligibility of Broadcast Talks,” 303.

¹⁴² Silvey, “The Intelligibility of Broadcast Talks,” 303.

¹⁴³ Silvey, “The Intelligibility of Broadcast Talks,” 303. Original emphasis.

simplification”.¹⁴⁴ Vernon warned, however, that these popularized talks would not appeal to educated listeners:

Thus if we follow the findings of this enquiry and devise future Light Programme or F.E.B. talks to appeal more to the interest of the bulk of the population, and couch them in an easier style, we shall inevitably arouse the antagonism of more intelligent listeners [...].¹⁴⁵

As mentioned before, the findings of these Further Education studies had a tremendous impact on the way the BBC sought to distribute its science programming across its three services. In short, the studies seemed to suggest that each network should not only deal with different scientific material, but should, for the most, present that material via different formats and presentation styles.

Thus, in answer to the hypotheticals that kicked off this section: if an F.R.S.-level scientist approached the BBC with an idea for a high-level talk on a topic such as the philosophical implications of advances in human genetics, that talk would most likely be placed on the Third – especially if that scientist were deemed to be un-radiogenic or insisted on suffusing his talk with the jargon of his field; if a radiogenic scientist approached the BBC with an idea for a series on a scientific topic of more general interest and was keen to appeal to a ‘general audience’, then that talk would most likely be placed on the Home – particularly if that scientist were willing to work with producers to craft a suitable script and deliver the talk in an engaging manner; if a scientist approached the BBC with an idea for a series on an area such as advances in household electronics and was keen to present the series as a feature or magazine programme, then that talk would most likely be placed on the Light – especially if that scientist did not mind serving primarily in an advisory role to a script writer or producer. These are, of course, only guidelines; exceptions no doubt exist. But they serve to offer an outline of the way the BBC approached science broadcasting during the first decade of the post-war period.

Although neither the Trenaman or Vernon studies were saying anything fundamentally new, their apparently empirical backing seemed to validate the approach the BBC had taken since the beginning of the post-war period. As Jones writes, “For the BBC, the findings

¹⁴⁴ Vernon, “The Intelligibility of Broadcast Talks,” 12.

¹⁴⁵ Vernon, “The Intelligibility of Broadcast Talks,” 62. “This should be no surprise”, the report continued: “An astonishingly large proportion of the adult population confines its reading to comic strips, the Daily Mirror and Picture Post, which are scorned by the well-educated.”

supported existing institutional practices, in particular the three-service network that had been developed just after the Second World War.”¹⁴⁶ In light of these findings, the BBC’s three services continued to provide science programming at three different levels of difficulty – judged by assumptions about background knowledge of science – and, importantly, they continued to do so through three largely different forms of presentation.

This three-way stratification of content and presentation style lasted until at least 1956, for at ‘The Presentation of Science to the Public’ conference in March of that year, Clow employed a similar three-way stratification of the audience and of the type of science programme thought suitable for each of the BBC’s three networks. Clow described the criteria by which the BBC assessed the “suitability of a topic for broadcasting and the performance of a scientist as a broadcaster”, and advised his audience that the “relative importance” of these criteria varied “greatly for the different broadcasting services.”¹⁴⁷ If one of the scientists in his audience were invited to deliver a “high level Third Programme talk”, Clow explained, then the emphasis could be on “the ideas embodied in the script” since on the Third the desire was “to present the authority at all cost, in spite of difficulties arising from, say, a marked foreign accent”.¹⁴⁸ For an “educational broadcast” on the Home Service – i.e. for a schools broadcast or a talk in *Science Survey* – much more emphasis would be placed on “imaginative treatment and performance”.¹⁴⁹ “The Light Programme audience”, he explained in conclusion, “is different again, and presenting science at that level is a very difficult task indeed.”¹⁵⁰

Part of the reason for this difficulty was what Clow referred to as the “limited background of such a large proportion of the general public.”¹⁵¹ “For example”, he explained elsewhere in his talk, “it has been said that listeners to the Light Programme today are the equivalent of the people who a hundred years ago could neither read nor write.”¹⁵² As a result, the BBC was not simply a “market for ‘authorities’.”¹⁵³ “Quite the reverse may be true,” he expanded:

¹⁴⁶ Allan Jones, “Joe Trenaman’s Investigation of BBC Listeners’ Understanding of Science” (Seventh British-North American Joint Meeting of the BSHS, CSHPS, and HSS, Philadelphia, PA, USA, 2012), 1.

¹⁴⁷ “The Presentation of Science to the Public,” 439.

¹⁴⁸ “The Presentation of Science to the Public,” 439.

¹⁴⁹ “The Presentation of Science to the Public,” 439.

¹⁵⁰ “The Presentation of Science to the Public,” 439.

¹⁵¹ “The Presentation of Science to the Public,” 442.

¹⁵² “The Presentation of Science to the Public,” 442.

¹⁵³ “The Presentation of Science to the Public,” 438.

... at certain levels the expert is the last person to use. Someone who has toiled to understand a particular development may well write a better script than the expert responsible for the particular development.¹⁵⁴

Thus, even Clow adopted the three-level stratification of the audience for science programming, characterized by information-heavy, jargon-filled talks for the elites who listened to the Third, and highly-mediated, simplified, and popularized programmes for the ‘dullards’ who listened to the Light.

6.6. *Losing the Light Programme audience*

Not long after moving to the BBC from Aberdeen, Clow had become convinced that in light of the wide-range of programming on its three varied services, no other organization in Britain was doing more to educate the public about the importance of science. In his 1953 article in the *Journal of the Royal Institute of Chemistry*, he argued that “since the end of the war and through the medium of radio”, the BBC had reached a “vast multitude of people” who would not have otherwise come into contact with scientists or the work on which they were engaged.¹⁵⁵ His comments show that even after nearly eight years he had not abandoned his goal of educating listeners about the potential benefits of science. “Taking a wide view”, he wrote, “it can be claimed, I believe with justice, that nowhere else is such a continuous and sustained effort being undertaken to make the population conscious of the potentialities of science and the ways of scientists.”¹⁵⁶

Lest his readers dismiss his assertion as less-than-objective boasting, Clow proudly relayed comments from the British Association’s latest Alexander Pedler Lecture. The BBC’s work in this area, Clow reported:

... was commented on felicitously by Sir Harold Hartley, F.R.S., in his recent Pedler Lecture, where he spoke of ‘the B.B.C., which has done much to make the public realise the outlook of the scientist and the impact of his work in almost every field of social and political well-being.’¹⁵⁷

¹⁵⁴ “The Presentation of Science to the Public,” 438.

¹⁵⁵ Clow, “Chemistry on the Air,” 578.

¹⁵⁶ Clow, “Chemistry on the Air,” 573.

¹⁵⁷ Clow, “Chemistry on the Air,” 573.

In fact, not long into his second decade at the BBC Clow would come to feel that the Corporation had surpassed the British Association as the premier communicator of science in Britain. In a 1959 memorandum to Controller, Talks (Sound), Clow would write:

The fact is that in large measure we have usurped the functions it used to exercise. Much of what now comes up at the annual meeting we have done justice to during the previous twelve months so that as a source of ideas it is distinctly unrewarding.¹⁵⁸

Despite his enthusiasm and pride, there was, at the time Clow made these comments in 1953, one major blemish on the BBC's record as a communicator of science as far as Clow was concerned. From July 1952 to May 1956 the BBC's science broadcasting was, on the whole, much more high-level than Clow – or even management – desired. Clow referred to this problem in his article in 1953. After explaining that the BBC had on average carried one science broadcast a day in 1949, Clow wrote:

The pattern of science broadcasting has changed somewhat since that survey was made in that, on the one hand, the Third Programme has considerably increased its content of science talks, while on the other, educational broadcasting to the Forces has come to an end.¹⁵⁹

“All in all”, he concluded, “it is unlikely that the total output of scientific broadcasts has fallen [from one talk per day], though it has admittedly moved towards the more difficult end of the broadcasting spectrum”.¹⁶⁰

In the survey of science programmes submitted to the Anderson Committee in 1949, the ‘pattern of science broadcasting’ over the Light, Home and Third had been 19 – 25 – 17, respectively, with *Science & Everyday Life* accounting for 14 of the 19 programmes on the Light, and Clow's fortnightly commitment accounting for 7 of the 17 programmes on the Third. Assuming Clow was right that the total output of science programming on BBC radio had stayed the same, and that the only major changes to the BBC's science programming were those identified by Clow – i.e. the Light Programme's cancellation of *Science & Everyday Life* in 1952 and the Third Programme's change from a fortnightly to a weekly science broadcast produced by

¹⁵⁸ Archie Clow to C.T.(S), “The British Association,” Memorandum, (September 28, 1959), R51/769/1, Written Archives Centre. Original emphasis.

¹⁵⁹ Clow, “Chemistry on the Air,” 573.

¹⁶⁰ Clow, “Chemistry on the Air,” 573.

Clow – then by the time Clow penned his article in 1953, the ratio of science programmes on the Light, Home and Third would have been closer to 5 – 25 – 24.

Clow assured his readers in 1953 that the BBC was aware of this imbalance, and was exploring ways of rectifying it. It would take a number of years, however, before the Light Programme would feel it had landed on a lasting solution. On 11 May 1955, just one month shy of Clow's ten-year anniversary at the BBC – and nearly three years since *Science & Everyday Life* went off the air – Clow would receive permission to begin developing *Who Knows?*, a popular science series that would help swing the BBC's output of science programming away from the 'more difficult end of the broadcasting spectrum'.¹⁶¹ Importantly, doing so would involve moving away from the BBC's commitment to straight talks from 'scientists themselves'. The next decade and a half, in fact, would see the BBC slowly take steps to mediate scientists on behalf of the British public.

¹⁶¹ Unknown Author (but initialed A.M.P.), "Extract from Light Programme Minutes - 11 May 1955," Memorandum, (May 16, 1955), R51/842/1, Written Archives Centre.

Part II:

Onward Into the Sixties

On the possible appointment of a Science Correspondent in News Division, Dr. Clow hoped that the appointment would liaise closely with Talks Division since his appointment would represent a departure from the precedent that science broadcasts should be provided by scientists themselves.

*'Science Broadcasts – Notes of a Meeting'*¹

¹ C.D. Shaw, "Science Broadcasts - Notes of a Meeting on Wednesday, 22nd October, 1958," October 27, 1958, 1, R51/967/1, Written Archives Centre.

Chapter 7:

Mediating Science and Scientists

As the broadcast debut of *Who Knows?* drew near, Archie Clow grew increasingly excited about the potential of the new Light Programme series. To hear him tell it: “a new light was about to appear in the Light Programme firmament”.¹ Instead of lecture-style talks by scientists, the new series was to be a scientific question and answer series featuring a revolving panel of four scientists along with a non-scientist acting as chairman. Each week the four scientists would respond to questions about science and technology that had been submitted by listeners on postcards sent directly to Broadcasting House. By consciously directing itself at a general audience on the Light, Clow was certain that *Who Knows?* would help swing the BBC’s science programming back from the ‘more difficult end of the broadcasting spectrum’ and further solidify the BBC’s reputation as one of the premier communicators of science in the country.

As it happened, Clow had good reason to be excited, for after its debut on 1 May 1956, *Who Knows?* broadcast over 250 programmes during an eleven-year run, and answered nearly 2,000 questions sent in from listeners across Britain.² More importantly, the new series was one of the more conspicuous examples of a growing trend within the BBC at this time toward mediating science and scientists for the general audience.

7.1. *Bringing scientists ‘down to earth’*

The debut of *Who Knows?* in May 1956 brought to an end the BBC’s nearly four year search for a weekly ‘popular science’ series that could appeal to a general audience on the Light. Features programmes on science had continued during that period, as had short reports in topical news programmes, but with the disappearance of *Science & Everyday Life* on 10 July 1952,

¹ Archie Clow to Talks Organiser (Light Programme), “Publicity for ‘Who Knows?’,” Memorandum, (April 26, 1956), R51/972/1, Written Archives Centre.

² A 1962 summary of the series written by Clow stated that *Who Knows?* had answered 116 questions during the previous run of 16 programmes, for an average of just over 7 questions per episode.

the Light had been left with little in the way of regular, spoken-word popular science programming.

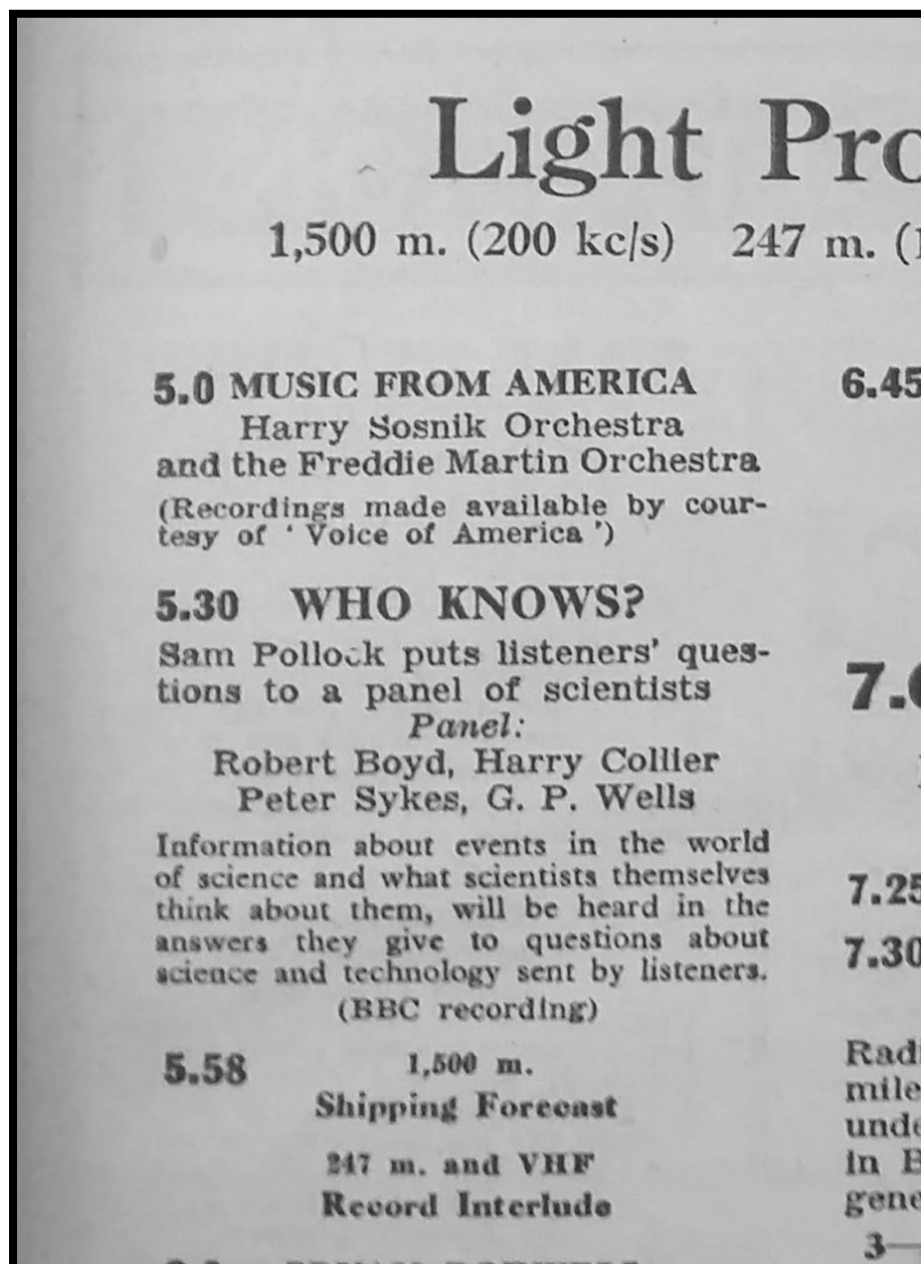


Figure 11: *Radio Times* listing for the second broadcast of *Who Knows?*, 8 May 1956.³

As early as two months after the final broadcast of *Science & Everyday Life*, BBC management were already drawing attention to this hole in the BBC's output.⁴ A major

³ "Who Knows?," *The Radio Times*, no. 1695 (May 4, 1956): 25.

⁴ Gilbert Phelps, "Light Programme Minutes - 22 September 1952," September 24, 1952, 2, R51/299/2, Written Archives Centre.

complication for BBC radio in the early- to mid-1950s, however, was the popularity and increasing importance of BBC television.⁵ The rapid growth of the audience for BBC television was altering the landscape in which science broadcasts on BBC radio had to survive. Indeed, at a Light Programme Talks meeting in February 1953, Mary Somerville, Controller (Talks), admitted that she was “inclined to wonder whether popular science should not now be regarded as falling in the province of Television rather than Sound Broadcasting”.⁶ Somerville noted that outside of Forces Educational Broadcasts – e.g. *Science & Everyday Life* – the Light had in the past traditionally “favoured Features treatment or topical talks by scientific journalists in ‘Topic for To-night’ and Radio Newsreel”.⁷ The growing importance of television, however, forced her to “consider to what extent there would be a continuing demand” for any form of popular science programming on BBC radio in the coming years.⁸ Richmond Postgate, Chief Assistant, Talks (Home Sound), disagreed, stating that he “found it difficult to accept the fact that the only scientific exposition attempted in Sound Radio was in Home Service and Third Programme”.⁹ What was needed, he asserted, was “a programme in Light that would popularise selected aspects of science.”¹⁰ The challenge, then, was to develop a popular spoken-word science series that could exist in this new landscape and appeal to a general audience that not only had three radio services from which to choose, but an increasingly attractive television service as well. The type of science programme that had appealed to Light Programme listeners in the previous decade might not appeal to them in the next.

Although a number of BBC producers and programme-developers explored various ways of presenting popular science for the Light Programme audience over the next three years, none of the potential programmes pitched at Light Programme Talks meetings made it on air or even made it to the point where a pilot could be recorded. The format and content varied, but one thing these aborted series had in common was that they all moved – to varying degrees – away from a reliance on scientists themselves to deliver information about science. Features and topical programming had already been mediating scientists for their audiences, but slowly the Light Programme began to believe that even in its more traditional spoken-word science programming much more would need to be done to mediate science and scientists for the

⁵ Viewing began to exceed listening in 1955. Crisell, *Introductory History*, 76.

⁶ Elisabeth Rowley, “Light Programme Minutes - 9 February 1953,” February 11, 1953, 3, R51/299/3, Written Archives Centre.

⁷ Rowley, “Light Programme Minutes - 9 February 1953,” 3.

⁸ Rowley, “Light Programme Minutes - 9 February 1953,” 3.

⁹ Rowley, “Light Programme Minutes - 9 February 1953,” 2–3.

¹⁰ Rowley, “Light Programme Minutes - 9 February 1953,” 3.

general audience. The days of handing scientists five, ten, or even fifteen minutes to speak directly to a general audience and trusting that these scientists could deliver their talks at an appropriate level were, at least on the Light, coming to an end.

Throughout these years, the BBC became more open to the idea of utilizing a mediator who could either deliver science content at the right level on his or her own, or who could interpret for listeners in programmes that involved interviews or discussions with actual scientists. This trend can be understood by looking at some of the popular science series proposed – and ultimately scrapped – during this period.

In September 1952, the Light attempted to develop a series (provisionally titled ‘Latest Development’) that, rather than consisting of straight talks from scientists, would be made up of interviews with scientists and guided tours through research laboratories. This approach was not altogether new since, as has been seen, Ian Cox’s original 1946 version of *Science Survey* included occasional outside broadcasts from famous research laboratories. Yet whereas Cox’s version of *Science Survey* – originally developed for and broadcast on the Light Programme – had trusted physicist and Fellow of the Royal Society, E.N. da C. Andrade, to interview scientists himself, by 1952 BBC producers were concerned with utilizing someone who not only understood the level of science appropriate for the Light Programme audience, but was capable of ensuring that scientists delivered their material at that level. As Somerville put it during the planning of the series, the BBC would need to enlist someone “experienced in the problems of presenting scientific information educationally” in order to “ensure that the material elicited in interviews should be at the right level.”¹¹ Though an experimental pilot on radio isotopes was commissioned in December 1952, the series was scrapped before it could be recorded. Controller (Light Programme) reported that he was “distressed at this” since he believed that “popular science was something with which Light Programme should be dealing.”¹²

Five months later, during a meeting in the summer of 1953, the Light tried again to develop a series of spoken-word science programmes at a popular level, with Rooney Pelletier describing the proposed approach as something akin to “responsible science fiction” – as

¹¹ Gilbert Phelps, “Light Programme Minutes - 29 September 1952,” October 1, 1952, R51/299/2, Written Archives Centre.

¹² Elisabeth Rowley, “Light Programme Minutes - 2 February 1953,” February 3, 1953, R51/299/3, Written Archives Centre.

distinct from “scientific fantasy”.¹³ Once again, nothing came of the proposal, but during the same meeting, the Home Service expressed its own desire for a science series aimed at a general audience. This request from the Home Service is not too surprising considering that until 1955 *Science Survey* was aimed at “scientists in other fields, or those ‘on the fringe’.”¹⁴ Other than the occasional stand-alone talk or summer series, the Home, too, lacked a spoken-word science series for a general – i.e. non-specialist – audience. At the meeting, representatives of the Home Service signaled their interest in “a ‘Junior’ Science Survey, i.e. one on a lesser level of difficulty than the present Science Survey.”¹⁵ Postgate later reported that the attendees were agreed that to achieve this ‘lesser level of difficulty’, a junior *Science Survey* would have to reject the original survey’s commitment to relying on scientists. “It was thought”, wrote Postgate, “that [a junior *Science Survey*] could be provided either by a single ‘science correspondent’ or a small team of broadcasters”.¹⁶ It was also agreed that if the series did turn to a scientist for a report on his or her work, it “should not aim, as does Science Survey, to use a top-notch on each subject but should put broadcasting ability at a higher premium”.¹⁷ Those assembled at the meeting were particularly interested in securing the assistance of C.L. Boltz, a well-known popular writer on advances in electronics¹⁸ who, since 1952, had been serving as a science correspondent for the BBC European Service.¹⁹ As was often the case during this period, little came of this proposal.

A year and a half later, in January 1955, the Light Programme tried again, this time reaching out to the Association of British Science Writers to set up a meeting to discuss “the problems of encouraging more young men and women to go in for Science”.²⁰ H.E.B. met with the science journalist Ritchie Calder – a founding member of the ABSW – to discuss the possibility of him serving as chairman of a potential new popular science series, and Controller (Light Programme) expressed his hope that the BBC might be able to identify a number of

¹³ Richmond Postgate to C.T.(H.S.), “Science Proposals,” Memorandum, (June 22, 1953), 2, R51/523/7, Written Archives Centre.

¹⁴ Chief Producer, Talks, “Home Service Programme Board Meeting of June 30th 1950.”

¹⁵ Postgate to C.T.(H.S.), “Science Proposals,” 1.

¹⁶ Postgate to C.T.(H.S.), “Science Proposals,” 1.

¹⁷ Postgate to C.T.(H.S.), “Science Proposals,” 1.

¹⁸ Cecil Leonard Boltz, *Everyman’s Wireless* (G.G. Harrap & Co.: London, 1932); Cecil Leonard Boltz, *Wireless for Beginners*. (Pl. 5. G.G. Harrap & Co.: London, 1933); Cecil Leonard Boltz, *Basic Radio* (New York: Ronald Press Co., 1944).

¹⁹ Postgate to C.T.(H.S.), “Science Proposals,” 1.

²⁰ Miss Glasgow, “Light Programme Minutes - 26 January 1955,” January 26, 1955, 2, R51/871/2, Written Archives Centre. It is not clear if this meeting ever took place.

suitable new broadcasters and science correspondents from within the association's ranks.²¹ This series was also scrapped.

It is not clear whether Clow was present for any of these deliberations over this period, but he likely would have been pleased by the increasing commitment to employing science correspondents and the growing prioritization of broadcasting ability over eminence whenever selecting scientific contributors. Nearly a decade after Clow had failed in his attempt to institute similar changes in *Science Survey*, his approach was beginning to gain traction.

A series proposed by Tony Gibson, Younger Generation Programmes, in March 1955 conveys a sense of the role envisioned for a chairman or 'mediator' of a popular science series during this period. The proposed series, entitled 'Asking in the Boffin', was designed to appeal "both to the younger generation, and to a wider adult audience on the Light Programme", and was to rely heavily upon interviews and actuality recordings from laboratories, factories, job-sites etc.²² In each episode, a "layman" would describe a "problem" they had witnessed first-hand – e.g. an accident in a coal mine caused by an electrical malfunction – after which a "research scientist" and "technician" would describe the various ways that science had addressed the problem.²³ Crucially, the series would also feature what Gibson referred to as "an intermediary" whose role was to interview the experts, offer comment, and summarize the important points from each episode.²⁴ Gibson was clear that such an intermediary would need to be "quietly and engagingly firm with the eminent", and be capable of bringing scientists "down to earth."²⁵ This programme, too, was dropped before a single episode made it on the air.

Though producers and programme-developers were gradually moving toward mediating science and scientists for the Light Programme and Home Service audiences, there were those within the Corporation who felt differently. The Board of Governors, for their part, still felt scientists should be responsible for presenting science to the public – even on the Light. At a Board Meeting on 28 October 1954 – nearly two and a half years since the cancellation of *Science & Everyday Life* – the Governors of the BBC expressed their displeasure at the fact that "attempts to increase the number of broadcasts on scientific subjects in the Light Programme

²¹ Elisabeth Rowley, "Light Programme Minutes - 19 January 1955," January 19, 1955, 326, R51/871/2, Written Archives Centre; Glasgow, "Light Programme Minutes - 26 January 1955."

²² Tony Gibson to H.E.B., "Light Programme Science Series Proposals," Memorandum, (March 8, 1955), 1, R51/972/1, Written Archives Centre.

²³ Gibson to H.E.B., "Light Programme Science Series Proposals," 1.

²⁴ Gibson to H.E.B., "Light Programme Science Series Proposals," 1.

²⁵ Gibson to H.E.B., "Light Programme Science Series Proposals," 3.

had not met with great success”.²⁶ They went on to insist that “the Light Programme audience was sufficiently interested in science to accept straightforward expositions by scientists”.²⁷ The Governors’ commitment to using scientists themselves is not too surprising given that for the better part of a decade the BBC had been adamant that the role of the BBC when it came to spoken-word broadcasts (i.e., excluding features or topical programming) was not to mediate or interpret science for the public but was to help scientists speak for themselves. Even the role of mediation, were it deemed desirable, had largely been considered to be the domain of scientists. Indeed, when R.A. Rendall wrote in 1946 that Clow’s ‘competent publicist’ might “have a place in the Light Programme”, he nonetheless made it clear that he would prefer such a figure to be “a so-to-speak ‘practising’ scientist, if possible.”²⁸ Furthermore, although B.E. Nicolls promised Lawrence Bragg in 1949 that the Light Programme science magazine, *Searchlight*, would include a weekly contribution from a ‘science commentator’,²⁹ in the end the only such commentaries offered in the short-lived programme appear to have been by scientists of F.R.S. status.

This debate over who should speak for science was taken up again in April 1955 when the Board of Governors once again commented on the “lack of Science talks in Light Programme” and offered the biologist Michael Swann’s recent trio of *Science Survey* talks, ‘Looking at Life’, as scripts that “would have been suitable for Light Programme.”³⁰ Clow disagreed with the Board, however, and reported that the talks, although suitable for *Science Survey*’s specialized audience on the Home Service, “could not be simplified further”, and therefore could not be made suitable for a “majority audience” on the Light.³¹

7.2. ‘making it clear, getting it straight’

What Clow proposed instead was a lively question and answer programme similar to *The Brains Trust* – a popular Q&A programme that featured a revolving panel of famous politicians, philosophers, artists, and scientists engaging in spontaneous discussions about a wide range of topics. Clow planned to encourage members of the Light Programme audience to write their questions about science on postcards and mail them to Broadcasting House. Assuming a critical

²⁶ Clerk to the Board to D.S.W., “Minutes of Board Meeting - 28 October 1954,” Memorandum, (November 2, 1954), R51/523/7, Written Archives Centre.

²⁷ Clerk to the Board to D.S.W., “Minutes of Board Meeting - 28 October 1954.” Original emphasis.

²⁸ Rendall to Grisewood, “Observations by Dr. Clow.”

²⁹ B.E. Nicolls to Lawrence Bragg, Letter, (September 1, 1949), R6/34, Written Archives Centre.

³⁰ Talks Organiser (Home Service and Light Programme Talks), “Light Programme Minutes - 6 April 1955,” April 6, 1955, 3, R51/871/2, Written Archives Centre.

³¹ Talks Organiser (Home Service and Light Programme Talks), “Light Programme Minutes - 6 April 1955.”

mass of questions was forthcoming, he could then assemble three to four scientists from various fields who would attempt to spontaneously answer as many of the audience's questions as possible.

This emphasis on spontaneous discussion fitted the BBC's approach to radio programming as a whole during this period. In 1953, in fact, Harman Grisewood, Director of the Spoken Word, noted a change from formal talks modeled on university lectures to informal and increasingly unscripted discussions designed to resemble conversations.³² According to Briggs, Grisewood believed "the war-time role of the BBC as a 'voice of authority' had gradually become more and more unpopular with the public, and there was a growing demand for spontaneous chat and sharp dissent."³³ Programmes that sought to communicate with the audience rather than talk to or at them were increasingly encouraged.³⁴ Crisell sees the concurrent moves towards conversation and topicality as indicative of "a growing democratic revulsion against 'someone else knowing best'".³⁵ By encouraging his scientists to engage in spontaneous discussion, Clow could parallel these wider changes within the BBC.

Clow had good reason to believe that a scientific question and answer programme would be successful, for not only had he developed a similar question and answer programme during his time in the SEU (*Scientist's Information Room*), but Nan's experiment in 1952 while head of *Science & Everyday Life* had seemed to prove the viability of the format.³⁶ In her 19 June 1952 report she explained:

The 'Brains Trust' type of programme proved to be very suitable for putting over technical or factual material as this form with its interplay of question and answer allows for easy recapitulation – a difficult thing to do well in a straight talk.³⁷

Three years after Nan's experiment Archie was attempting to develop just such a programme for the Light Programme audience. Crucially, in order to encourage the proper amount of 'recapitulation', Archie proposed that the new series should be chaired by a figure who, rather than simply read the questions and direct the conversation, would serve to draw out information,

³² Briggs, *Sound and Vision*, 4:532.

³³ Briggs, *Sound and Vision*, 4:532.

³⁴ Briggs, *Sound and Vision*, 4:534.

³⁵ Crisell, *Introductory History*, 77.

³⁶ As mentioned in Chapter 4, management rejected Clow's attempt to insert a reincarnation of 'Scientist's Information Room' into *Science Survey*.

³⁷ Clow, "Report on F.E.B.s - Science and Everyday Life," 2.

summarize the explanations of each scientist, and interpret scientists' responses on behalf of the listener.

To secure such a figure, Clow and the BBC attempted to draw upon experienced journalists or established science writers. At various points in the planning process Clow contemplated hiring: John Hillaby, zoological correspondent for the *Manchester Guardian* from 1949 and European science correspondent for the *New York Times* from 1951;³⁸ Gerard Fay, arts and film critic and London editor of the *Manchester Guardian*; and the aforementioned C.L. Boltz who, in addition to serving as science correspondent for the BBC European Service, was a frequent broadcaster for Archie Clow on *Science & Everyday Life*.³⁹ Eventually, Archie settled on Sam Pollock, the long-time BBC contributor and presenter who had previously worked with Nan Clow during her period in charge of *Science & Everyday Life*. Though many of these potential chairmen had backgrounds in science or industry, all were more properly journalists or broadcasting professionals than practicing scientists.

After the first few broadcasts of the series went out on the Light Programme in the spring of 1956, Clow commissioned the Further Education department to conduct a survey of listener reactions. The resulting report by Joseph Trenaman gives a sense of the role Pollock was expected to play within the series. Trenaman commended Pollock for exercising "at least some control" in order to keep the panel on topic, and further commended him for ensuring that the panel restricted their use of scientific jargon and clarified the meaning of words like 'attenuated' that might prove difficult for the Light Programme audience.⁴⁰ In a somewhat regrettable turn of phrase, Trenaman praised Pollock for helping the panel of scientists to "simplify and never forget for one moment" what Trenaman referred to as "the literal and restricted minds of so many ordinary people."⁴¹ He further reported that the Light Programme listeners surveyed by his department had appreciated the fact that Pollock had "made some attempt to 'bring [the scientists] back to the point' or to 'get questions answered'."⁴² Ultimately, Trenaman could report

³⁸ Douglas Matthews, "Obituary: John Hillaby," *The Independent*, October 21, 1996, <http://www.independent.co.uk/news/people/obituary-john-hillaby-1359601.html>.

³⁹ In the spring of 1950 Boltz presented the six-part *Science & Everyday Life* series, 'Understanding About Electricity'.

⁴⁰ Joseph Trenaman to Archie Clow, "Who Knows?," Memorandum, (May 3, 1956), R51/972/1, Written Archives Centre.

⁴¹ Trenaman to Clow, "Who Knows?"

⁴² Joseph Trenaman to H.E.B., "Summary of E.O.s' Evidence on the Light Programme Science Broadcasts 'Who Knows?' - 1 May to 6 June, 1956," Memorandum, (August 31, 1956), 2, R51/972/1, Written Archives Centre.

that the listeners surveyed had indeed expressed a preference for hearing “a panel with a chairman to hearing a straight talk”.⁴³

As a non-scientist, Pollock often attempted to serve as a surrogate for any other non-scientists in the audience by asking for clarification on points that even he found confusing – indeed Pollock often drew attention to his status as “a complete layman”.⁴⁴ In a broadcast on 15 May 1956, Pollock interrupted the chemist Peter Syke’s description of the creation of synthetic proteins to ask: “I wonder if most listeners are as puzzled as I am – what is the connection then – between proteins and life?”⁴⁵ The following year, Pollock pressed the meteorologist B.J. Mason for an explanation of what it means when ice-crystal formations exhibit hexagonal symmetry. “Could I have a note on this hexagonal symmetry?” Pollock asked: “That one got past me.”⁴⁶

Pollock also often strove to ensure that the panel stayed focused on the question at hand rather than get lost in the intricacies of a scientific curiosity – as they were often wont to do. After listening to the panel go round and round about the intricacies of surface tension and molecular bonding, for instance, Pollock expressed what must have been the opinion of many in the audience when he interrupted: “Would anyone like to give me a simple definition of surface tension? [...] Everyone’s butting in here but no one’s contributing much at the moment.”⁴⁷ At the end of each discussion, Pollock would also attempt to summarize the panel’s answer in terms that the audience – and he – could understand. This usually meant beginning his summary with a variation of the phrase, ‘Now, I hope the panel will correct me if I’m wrong but, as a layman, would I be right in summarizing the situation as...’.

Often the panel would begin answering a question that had not been asked, at which point Pollock would try his best to clarify the question for the panel and get them to respond to the original question. In a particularly long-winded exchange in a broadcast on 22 January 1957, Pollock pressed the pharmacologist Harry Collier to answer a question from Miss C.C. Killey of Edinburgh about whether the sugar in sweets *causes* tooth decay or simply causes pain in teeth

⁴³ Trenaman to H.E.B., “Summary of E.O.s’ Evidence on the Light Programme Science Broadcasts ‘Who Knows?’ - 1 May to 6 June, 1956,” 2.

⁴⁴ Microfilm Script, *Who Knows?* (Light Programme, January 1, 1957), 11, Radio Talks Scripts Pre-1970 (Film T645), Written Archives Centre.

⁴⁵ Microfilm Script, *Who Knows?* (Light Programme, May 15, 1956), 2, Radio Talks Scripts Pre-1970 (Film T645), Written Archives Centre.

⁴⁶ Microfilm Script, *Who Knows?* (Light Programme, January 29, 1957), 4, Radio Talks Scripts Pre-1970 (Film T645), Written Archives Centre.

⁴⁷ May 15, 1956, 4.

that have already decayed due to other factors. After listening to Collier's answer about how sugar causes pain in exposed nerves, Pollock attempted to bring Collier back to the original question:

- Pollock: Yes – but now – yes, but *why* do they make the teeth more prone to ache?
- Collier: Oh well that's another question.
- Pollock: Yes, well okay, well can we take that one?
- Collier: I don't think Mrs. Killey asked that one.
- Pollock: No, but you see Mrs. Killey [asks] why sweets make teeth ache – you see, you've told us that if you have imperfect teeth sweets [and ice-cream] will make it ache, but is there anything special about sweets that will [...] bring your teeth to the stage where they ache?
- Collier: The point of ice-cream is, of course, that it also stimulates the pain endings [...] through cold.⁴⁸

Discouraged, Pollock decided to move on: "Well I hope Mrs. Killey is satisfied with my pursuance of her question there and that she's also satisfied with the answer."⁴⁹

As this exchange shows, the insertion of Pollock into a Light Programme science series represented a move by the BBC to insert a mediatory figure into its spoken-word science programming. Pollock was there to draw out information and help ensure that the audience could understand the answers and information which scientists were trying to communicate. Pollock was not without his flaws and inadequacies, however. Though he had the necessary broadcasting skills, there were those within the BBC who did not think his lack of scientific training an asset. As Mary Somerville put it in a memo on 2 January 1958:

What is it that I find wrong in Sam Pollock. a) he doesn't carry conviction as being interested himself in what is supposed to be of interest to listeners. What one wants is [...] genuine-sounding curiosity and pleasure in being there to draw the knowledge out. b) his attempts to elucidate on the [listener's] behalf almost always flop because he hasn't really grasped the point himself but indeed gets confused in a peculiar way of his own.⁵⁰

⁴⁸ Microfilm Script, *Who Knows?* (Light Programme, January 22, 1957), 5–6, Radio Talks Scripts Pre-1970 (Film T645), Written Archives Centre.

⁴⁹ January 22, 1957, 6.

⁵⁰ Mary Somerville, "Copy of Extract from Miss Somerville's Programme Notes on 'Who Knows?,'" January 2, 1958, R51/972/1, Written Archives Centre.

Somerville would seem to have had a point. Pollock, in fact, regularly admitted that points had gone over his head. After asking for a “quick answer” to a question from a photographer in Carlisle about camera lenses, for instance, Pollock conceded that the answer which he received had been lost on him: “Yes, well, obviously the answer was much more complicated than I imagined [...] and I hope our photographer in Carlisle grasped it because I wouldn’t attempt to summarise it”.⁵¹

By the time the third series of *Who Knows?* debuted in October 1958, Clow had replaced Pollock with G.P. Wells, a zoologist, frequent contributor to Clow’s *Science & Everyday Life*,⁵² and frequent guest on *Who Knows?* over the course of its first two series. Though Wells was tasked with much the same role as Pollock – i.e. mediating for the audience – it was expected that his scientific training would enable him to summarize important points with significantly less difficulty than Pollock. Whether listeners would miss Pollock’s attempts to act as a surrogate for non-scientists, however, was up for debate. This debate over who was qualified to speak for science and whether scientific training was an asset or liability for prospective communicators of science, would recur throughout this period.

⁵¹ Microfilm Script, *Science Survey* (BBC Home Service Basic, January 8, 1947), 15, Radio Talks Scripts Pre-1970, Written Archives Centre.

⁵² Wells made upwards of 20 appearances in *Science & Everyday Life* from 1948 to 1950.

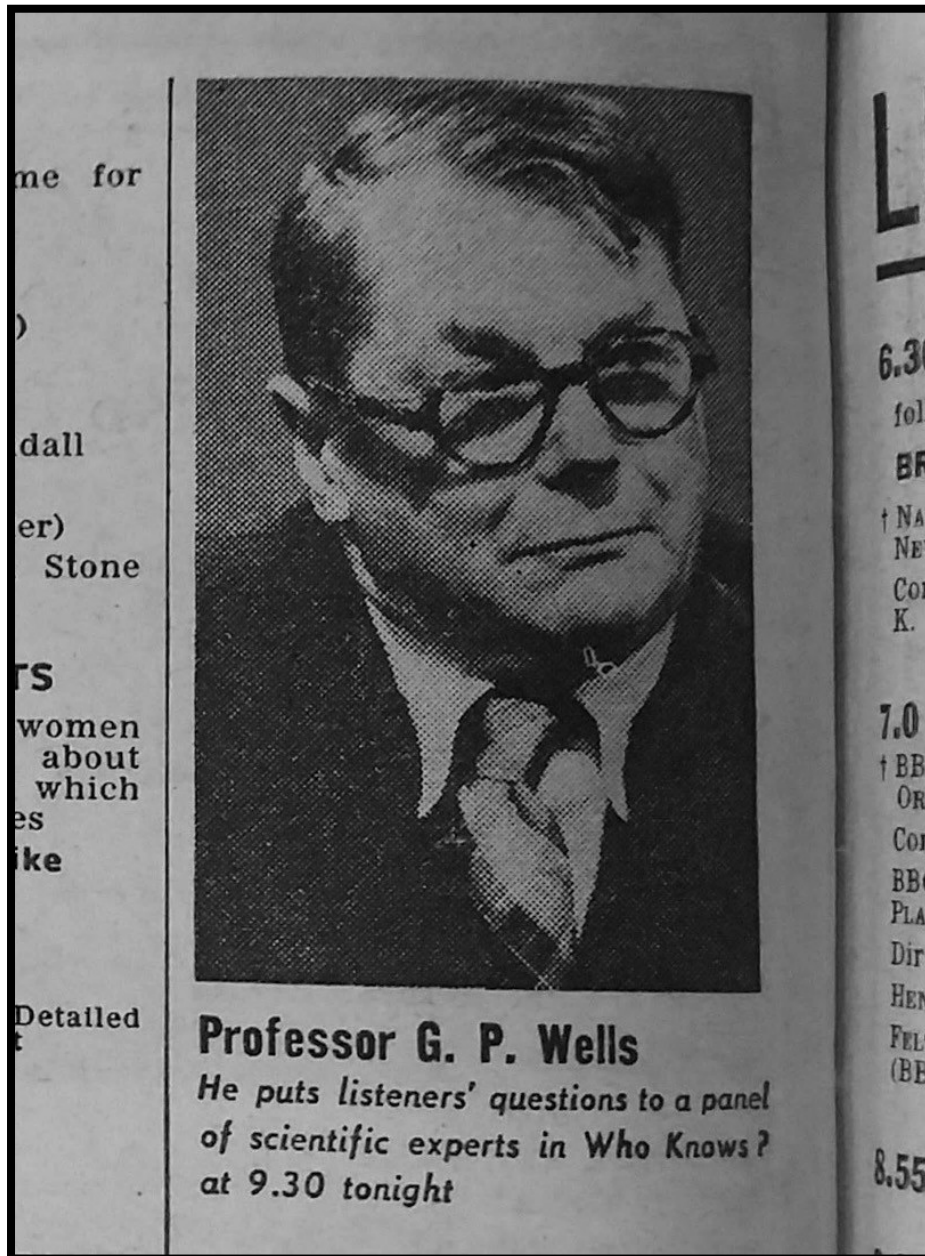


Figure 12: *Radio Times* listing for the 18 October 1962 broadcast of *Who Knows?* featuring chairman G.P. Wells.⁵³

As noted above, *Who Knows?* was part of a wider trend towards mediation in science programming. At the same 11 May 1955 Light Programme Talks meeting during which Clow received permission to develop *Who Knows?*, Isa Benzie – a features producer responsible for a number of programmes on health and medicine during the first decade of the post-war period – received permission to develop a medical quiz that would utilize a nearly identical approach to

⁵³ “Who Knows?,” *The Radio Times*, no. 2031 (October 11, 1962): 46.

that of *Who Knows?*.⁵⁴ Entitled *Is There a Doctor in the House?*, the series was to focus on questions related to health, medicine and biology, and would bring together a panel composed of a general practitioner, a consulting physician, a guest ‘eminent specialist’, and a chairman. As with *Who Knows?*, the desire within the BBC was for the chairman to be a layman rather than a practicing scientist. Even Controller (Light Programme) informed Benzie and the planners of the series that he “would prefer a layman as chairman if possible”.⁵⁵ Benzie put forward various politicians, journalists, and writers for the position of chairman, and at one point attempted to secure the services of the well-known science writer, Ritchie Calder,⁵⁶ but within a month of beginning development on the series she had settled on Percy Cudlipp,⁵⁷ a Welsh journalist, former editor of the *Evening Standard* and *Daily Herald*, and regular contributor to another BBC question and answer programme, *Any Questions?*. Cudlipp would eventually become the first editor of *New Scientist* in 1956 – despite the fact that, as Ritchie Calder’s son Nigel put it in 1966, Cudlipp “knew nothing about science”.⁵⁸ Cudlipp was, however, a seasoned and experienced broadcaster.

Benzie envisioned Cudlipp fulfilling much the same role as Clow had envisioned for Pollock. In a draft of an advertisement for the inaugural broadcast of the series, Benzie explained the reasoning behind employing Cudlipp as chairman: “Percy [...] feels this will be a useful programme, but knows people don’t always understand when doctors explain: that is his particular job in the programme, making it clear, getting it straight.”⁵⁹

If *Who Knows?* and *Is There a Doctor in the House?* had one major difference – other than the fact that one focused on the ‘hard’ sciences while the other focused on health and medicine – it was that whereas Clow had decided early on to pre-record each programme and have listeners’ questions read out by the chairman, Benzie was determined to bring each ‘questioner’ to the studio to ask their question directly to the panel, and to have the series recorded in front of a live audience. These two provisions, Benzie hoped, would help the panel keep their answers at the proper level since they would be able to immediately gauge whether their answers had been

⁵⁴ Unknown Author (but initialed A.M.P.), “Extract from Light Programme Minutes - 11 May 1955.”

⁵⁵ Talks Organiser, Light Programme, “Light Programme Minutes - 25 May 1955,” May 25, 1955, R51/871/2, Written Archives Centre.

⁵⁶ Assistant Controller, Talks (Sound) to I.D. Benzie, “Programme on Health,” Memorandum, (May 9, 1955), R51/842/1, Written Archives Centre.

⁵⁷ Talks Organiser, Light Programme, “Light Programme Minutes - 8 June 1955,” June 8, 1955, 2, R51/871/2, Written Archives Centre.

⁵⁸ Nigel Calder, “How New Scientist Got Started (Classic Article from 1966),” *New Scientist*, November 16, 2006, <https://www.newscientist.com/article/dn10574-how-new-scientist-got-started/>.

⁵⁹ I.D. Benzie, “Laughs and Coughs,” December 16, 1955, R51/842/1, Written Archives Centre.

understood.⁶⁰ Though Clow, too, wanted to ensure that listeners were able to understand the panel, he was skeptical about bringing people to Broadcasting House to ask their health-related questions in a live broadcast. When Benzie first submitted her outline for the series in May 1955, Clow asked whether such a policy would not invite the prospect of “a man with Hodgkin’s disease dragging himself in to ask on the air for advice on his condition”.⁶¹ Benzie was livid. “The picture so vividly drawn [...] by Dr. Clow”, wrote Benzie in a letter to Somerville:

... is outrageous. I have no compunction in saying so, for it is (obviously) dangerous [...]. Gross disparagement of one section by another is out of place at any time, is it not, and particularly so when we are supposed to be closing the ranks.⁶²

Somerville would later assure Benzie that Clow was “patently joking”,⁶³ but there were evidently tensions between the Features and Talks departments at this time – despite the fact that the various supply departments for sound broadcasting were meant to be coming together in the face of increasing competition from television.

Regardless, it is perhaps a sign of the slowly changing landscape within radio during the mid-1950s that two producers from departments responsible for disparate genres of radio – i.e. talks and features – developed similar programmes at the same time. The end goal of both was to ensure that listeners understood the information scientists were trying to impart to them, and throughout the latter half of the 1950s, this increasingly meant installing a mediator to summarize information for the audience and to ensure that scientists pitched their material at what the BBC felt was the right level.

7.3. *‘It’s the information they want’*

Who Knows? not only forced Clow to grapple with how best to mediate scientists for the Light Programme audience, it also taught him a lesson about what exactly the audience for BBC radio desired and expected from scientists and science programmes more generally. Though Clow had initially assumed that in order to appeal to a general audience *Who Knows?* would have

⁶⁰ Unknown Author (but initialed A.M.P.), “Extract from Light Programme Minutes - 11 May 1955.”

⁶¹ I.D. Benzie to C.T., “Mr Pelletier’s New Programme: Medical Quiz (Working Title),” Memorandum, (May 12, 1955), R51/842/1, Written Archives Centre.

⁶² Benzie to C.T., “Mr Pelletier’s New Programme: Medical Quiz (Working Title).”

⁶³ Handwritten note on I.D. Benzie to C.T., Memorandum, (May 12, 1955), R51/842/1, Written Archives Centre.

to be upbeat, entertaining, and perhaps even slightly gimmicky, he quickly learned that listeners to *Who Knows?* placed a much higher premium on information.

To cultivate the right amount of engaging “chatter”, as he called it, Clow decided that the panel of speakers should have no fore-knowledge of the questions to be asked of them during each programme.⁶⁴ This paralleled the general trend toward spontaneous discussion identified by Grisewood in 1953, and was in keeping with the approach of *The Brains Trust* which was routinely advertised as “spontaneous”⁶⁵ or “impromptu”⁶⁶ answers to listeners’ questions. However, after surveying test audiences of “L.P. types” – defined as a “Community Centre group on a housing estate” – Trenaman and his colleagues in the Further Education Unit found that listeners valued answers not banter.⁶⁷ The Education Officer reporting from Aberdeen wrote that the test audience disliked the fact that the panel of scientists “did not seem to know enough about the subjects”,⁶⁸ while the officer reporting from the south region wrote that there was “a general feeling that the programme was too casual and not precise enough”.⁶⁹ In his own summary, Trenaman explained:

The crux of the matter seems to be that the spontaneity which it was hoped to suggest by giving unprepared answers in no way compensated, if ever it was noticed by this audience, for the resulting poverty of some of the answers given.⁷⁰

“You may think”, wrote Trenaman in a memo directly to Clow, “that the public sets great store on spontaneous answers, but I am quite sure that if you could talk to a dozen actual listeners to that programme, they would neither know nor care. It’s the information they want.”⁷¹ The fact that the panel was often unable to supply this information made the scientists look inexperienced and incompetent. As Trenaman put it: “the scientists were made to look embarrassingly ignorant.”⁷²

⁶⁴ Archie Clow to Chief Assistant Talks (Sound), “Who Knows?”, Memorandum, (January 3, 1957), R51/972/1, Written Archives Centre.

⁶⁵ “The Brains Trust,” *The Radio Times*, no. 1025 (May 21, 1943): 10.

⁶⁶ “The Brains Trust,” *The Radio Times*, no. 1286 (June 4, 1948): 10.

⁶⁷ Senior Education Officer, S.B.C., “Further Education: Listening End Work on L.P. Science Series ‘Who Knows?’,” Memorandum, (April 27, 1956), R51/972/1, Written Archives Centre.

⁶⁸ Trenaman to H.E.B., “Summary of E.O.s’ Evidence on the Light Programme Science Broadcasts ‘Who Knows?’ - 1 May to 6 June, 1956,” 2.

⁶⁹ Trenaman to H.E.B., “Summary of E.O.s’ Evidence on the Light Programme Science Broadcasts ‘Who Knows?’ - 1 May to 6 June, 1956,” 2.

⁷⁰ Trenaman to H.E.B., “Summary of E.O.s’ Evidence on the Light Programme Science Broadcasts ‘Who Knows?’ - 1 May to 6 June, 1956,” 2.

⁷¹ Trenaman to Clow, “Who Knows?”

⁷² Trenaman to Clow, “Who Knows?”

A case in point came in response to a question submitted by V.S. Corbett of Iwer, on the subject of whether horses are color blind. Pollock read the question aloud and turned to G.P. Wells, at that time the show's resident expert on zoological matters, for the answer. "I'm very very sorry", Wells responded, "this is a plain question of fact and I just don't know. I've never known a horse at all well in my life."⁷³ After a brief pause, Pollock opened the question up to the group:

Anyone know any good horses? No one anything to add about that at all? Well Mr. Corbett, you have, if I may borrow a phrase from other programmes, beaten the panel. They just don't know [...].⁷⁴

Those 'other programmes' Pollock alluded to would have been Q&A series such as *The Brains Trust* or *Any Questions?*, but his adoption of the terminology of those programmes highlights a fundamental distinction between them and *Who Knows?*. Typical *Brains Trust* questions – such as 'What does the Brains Trust consider the basis of happy marriage?' or 'What is the difference between the left and the right in politics' – were, for the most part, subjective and could therefore lead to spirited discussions between figures who approached the question from opposing viewpoints. The philosopher C.E.M. Joad and the biologist Julian Huxley – two established members of the 'Brains Trust' – might understandably come to opposing views on questions about science and its relation to philosophy, theology, or society, for example. In such a programme, the ability to argue one's position was arguably more important than an encyclopaedic knowledge of one's field. A question about whether horses are color blind, on the other hand, was, as Wells put it, 'a plain question of fact' and therefore called for a direct answer based on certain knowledge. In a *Radio Times* article celebrating the tenth anniversary of the series, Clow reflected on the different expectations of an audience for a scientific Q&A programme compared to an audience for a general Q&A programme: "Possibly the *Brains Trust* (unseen questions and all that), was the foster parent of *Who Knows?*, but to run a scientific programme we need a sound basis of hard fact."⁷⁵

According to an Education Officer who surveyed residents of Yate Aerodrome Estate outside of Bristol, what listeners had wanted – and indeed expected – from the series was something akin to *The Answer Man*, a series broadcast by the BBC's competitor, Radio

⁷³ Microfilm Script, *Who Knows?* (Light Programme, May 1, 1956), 13, Radio Talks Scripts Pre-1970 (Film T645), Written Archives Centre.

⁷⁴ May 1, 1956, 13.

⁷⁵ Archie Clow, "Who Knows?," *The Radio Times*, no. 2217 (May 5, 1966): 61.

Luxembourg.⁷⁶ The series was based on an American radio series of the same name during which the ‘answer man’, Albert Mitchell, would answer questions sent in by listeners.⁷⁷ Though Mitchell always seemed to know the answers off the top of his head, he was in fact supported by dozens of staffers who regularly made the trip across the street to the New York Public Library to locate answers.⁷⁸ With such a large staff, *The Answer Man* was able to ensure that the nearly one million people who sent in questions each year received a response in the post.⁷⁹ Listeners to *Who Knows?* apparently wanted similarly straight answers.

Trenaman, for his part, feared that Clow’s quest for liveliness and spontaneity had not only severely hindered the programme’s ability to act as a genuinely informative public service, but had also brought about the very real possibility that scientists on the panel would pass along false, or perhaps even dangerous, information. As a case in point, Trenaman pointed to the very first question ever asked on *Who Knows?*. After beginning the series by noting, “Now there’s been a lot of discussion and a great deal of concern about the alleged connection between lung Cancer and smoking”, Pollock turned to a question about “something which some people believe may be just as much to blame – air pollution.”⁸⁰ “Alicia Watson of Laurel Reed, Leicester asks this”, read Pollock: “Is it possible to invent something to do away with air pollution caused by motor buses and motor cars?”⁸¹ After responses by the chemist Peter Sykes and the physicist Robert Boyd, G.P. Wells chimed in:

I’d suggest that quite apart from inventing things to stop it – filter tips or an exhaust pipe or whatever it may be, we [could] go quite a long way by preventing those ways which now exaggerate the pollution. I believe for example there are some devices for heating the insides of cars which suck a lot of air from the exhaust of the car in front and blow it straight at you, I’m not quite sure about [that] but I’ve heard that it’s so, and if that’s true perhaps we could do quite a lot by stopping these bad devices.⁸²

Trenaman wrote to Clow to express his horror at such carelessly offered advice. “Allegations about motor manufacturers using exhaust fumes to heat cars were serious and should either be made definitely (from certain knowledge) or not at all”, he declared: “This surely was a question

⁷⁶ Education Officer, South Western Division to S.E.O., “Further Education: Listening Group on L.P. Science Series ‘Who Knows,’” Memorandum, (May 23, 1956), R51/972/1, Written Archives Centre.

⁷⁷ John Dunning, *On the Air: The Encyclopedia of Old-Time Radio* (Oxford University Press, USA, 1998), 37.

⁷⁸ Dunning, *On the Air*, 37.

⁷⁹ Dunning, *On the Air*, 37.

⁸⁰ May 1, 1956, 1.

⁸¹ May 1, 1956, 1.

⁸² May 1, 1956, 2.

calling for some single fact about just how far urban air is polluted and with what (soot, acids, etc.) and what the effects of different fuels are.”⁸³

Clow remained convinced that the “very great thirst for scientific information” could be met “at Light Programme level” by his new Q&A series, but he weighed “the alleged gains of spontaneity” against the numerous criticisms and agreed to let each member of the panel see the questions related to his or her field of expertise before each broadcast and to prepare a few bullet points.⁸⁴ From then on, each question would receive a one to two minute prepared answer from the resident expert – “But it must not be a heavy prepared statement!” – followed by two to three minutes of extemporaneous discussion involving the rest of the panel.⁸⁵ This, Clow hoped, would ensure that the series was able to provide direct and informative answers for those listeners who wrote in with questions, while still retaining an element of spontaneity.

Clow was also forced to admit that his attempts at increasing the appeal of the series for the Light Programme audience by arranging for light-hearted discussions – e.g. whether mermaids are real or whether the nervous energy of Celtic and Rangers supporters could be turned into energy for the national grid⁸⁶ – had not been successful. Indeed, one of Trenaman’s Education Officers reported that the members of his listening group were “irritated by questions which they regarded as frivolous”.⁸⁷ “The occasional ‘funny’ which I thought was a good idea”, wrote Clow to Wells in December 1956, “was not appreciated.”⁸⁸

Ultimately, the decision to rework the series and let scientists conduct a little “home work”, as Clow put it, was a response to what the audience expected from people who wore the label of ‘scientist’. As Clow put it in a letter to Wells before the start of the second series: “The public expects scientists to know”.⁸⁹ If a scientist on the radio could appear knowledgeable and authoritative while at the same time appearing engaging and spontaneously witty, so much the better, but according to Light Programme listeners the latter should never come at the expense of the former. Thus, Pollock began the seventh broadcast of *Who Knows?* by explaining the

⁸³ Trenaman to Clow, “Who Knows?”

⁸⁴ Archie Clow to G. P. Wells, Letter, (December 11, 1956), RCONT1 Wells, G.P. (1945-1962), Written Archives Centre.

⁸⁵ Clow to Wells, December 11, 1956.

⁸⁶ Microfilm Script, *Who Knows?* (Light Programme, May 22, 1956), 1, Radio Talks Scripts Pre-1970 (Film T645), Written Archives Centre.

⁸⁷ Trenaman to H.E.B., “Summary of E.O.s’ Evidence on the Light Programme Science Broadcasts ‘Who Knows?’ - 1 May to 6 June, 1956,” 1.

⁸⁸ Clow to Wells, December 11, 1956.

⁸⁹ Clow to Wells, December 11, 1956. Original emphasis.

change of approach: “A great many listeners have insisted that they get no pleasure at all from catching the experts out. What they want is as accurate and complete an answer as possible to their questions.”⁹⁰ Benzie, for her part, appears to have anticipated this response from the Light Programme audience even before the debut of her own Q&A series. “I like my personal doctors to behave like fallible human beings on the same level as I”, she wrote to a colleague during the planning of *Is There a Doctor in the House?*, “but good psychologists tell me that many people feel a need to invest their doctors with preternatural authority as beings almost from another sphere.”⁹¹

7.4. ‘something very useful indeed’

Having settled on a suitable chairman and presentation style, *Who Knows?* developed into one of the highest-rated series on BBC radio during the late 1950s and early 1960s. Over the eleven-year run of the series, Clow was able to ensure that *Who Knows?* remained relevant and pitched at the right level by essentially handing over control of the series to listeners. Rather than attempt to predict what the general audience wanted when it came to spoken-word science programming, Clow made it possible for listeners to tell him exactly what it was they wanted to learn about science. The series, as he often noted, practically ran itself. This proved useful in October 1957 when the series was transferred to the Home Service to take advantage of what Clow called an “excellent placing”.⁹² Few modifications were needed in order to accommodate the Home Service audience since, as Clow wrote to J.C. Thornton, Assistant Controller (Talks) “After a week or two the programme is, in a sense, controlled by the flow of questions, subject of course to editorial selection.”⁹³ As the nation moved from the 1950s into the more turbulent 1960s, this direct connection to the audience and its concerns enabled the series to change along with its audience.

Clow was even pleasantly surprised by the quality of the questions that filled his post-box each year. “They remain of a high order and give us a wonderful idea of what the public wants to know”, he wrote to Controller (Talks) in 1958: “and precious few of them are about Sputniks,

⁹⁰ January 1, 1957, 1.

⁹¹ Typewritten note added to Benzie, “Laughs and Coughs.”

⁹² Archie Clow to Assistant Controller Talks (Sound), “Who Knows?” Memorandum, (July 29, 1957), R51/972/1, Written Archives Centre.

⁹³ Clow to Assistant Controller Talks (Sound), “Who Knows?”

rockets or cyclotrons.”⁹⁴ An unremarkable but fairly indicative programme on 7 June 1962, for instance featured seven questions:

- How can one measure the temperature of a vacuum?
- How is it that a seedling is able to force its way through the soil when once it emerges it can be easily crushed between two fingers?
- Does the panel agree with Professor Hoyle that it is logical to suppose that our galaxy contains many suns with inhabited planets?
- Why do certain genetic characteristics lie dormant in certain descendants?
- Why is it that some plants like the Hawthorne tree have two different types of berries?
- Why do certain substances such as iron change color when heated?
- Is it possible to detect stars that have exhausted their energy sources and are therefore no longer emitting light?⁹⁵

Clow was perhaps even more pleased that “only a minute fraction” of the nearly 4,000 questions he received each year were from what he called the “lunatic fringe.”⁹⁶ He did, however, have to ask listeners to please stop asking one particular question: “not [...] that one about the bath water and the plug-hole, please!”⁹⁷

⁹⁴ Archie Clow to C.T., “The Future of ‘Who Knows?’” Memorandum, (November 25, 1958), R51/972/1, Written Archives Centre.

⁹⁵ Microfilm Script, *Who Knows?* (BBC Home Service Basic, June 7, 1962), Radio Talks Scripts Pre-1970 (Film T646), Written Archives Centre. These seven questions have been paraphrased and therefore do not represent direct quotes.

⁹⁶ Clow to C.T., “The Future of ‘Who Knows?’” The estimate of 4,000 questions per year is based on the fact that Clow noted he received 2,000 questions per 13-episode run and each year generally featured two distinct runs. Archie Clow to C.P.P.(S), “Who Knows?” Memorandum, (August 18, 1961), R51/972/1, Written Archives Centre.

⁹⁷ Clow, “Who Knows?” 61.

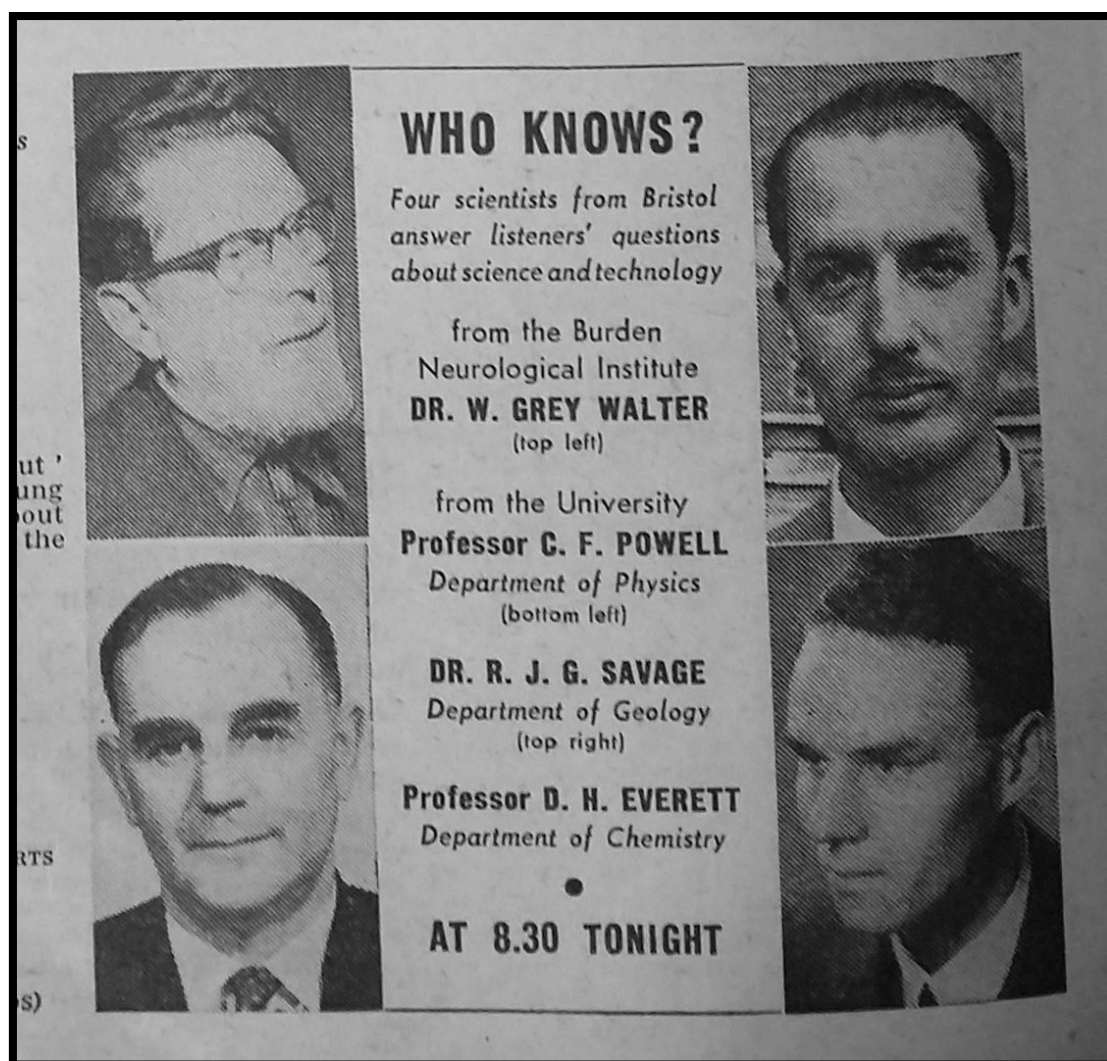


Figure 13: *Radio Times* advertisement for the 20 February 1964 broadcast of *Who Knows?*⁹⁸

Over the years, Clow went to great lengths to ensure that the BBC audience understood that *Who Knows?* was directed at a general audience rather than a specialized audience of scientists or ‘those on the fringe’. In a *Radio Times* article announcing the start of a new series in January 1962, he drew a subtle contrast with much of the BBC’s other science programming at the time:

It is an ordinary listeners’ programme. It isn’t a scientists’ programme, though we know perfectly well that scientists do quite a lot of sneak-listening. You know the sort of thing: ‘My dear chap, I just happened to be turning over to the Third when...’.⁹⁹

⁹⁸ “Who Knows?,” *The Radio Times*, no. 2101 (February 13, 1964): 42.

⁹⁹ Archie Clow, “Ask a Scientist,” *The Radio Times*, no. 1990 (December 28, 1961): 42.

As this comment suggests, despite the fact that the series was directed at a general audience and took steps to mediate scientists for that audience, Clow could also boast that the series was proving quite popular with scientists. In April 1962 Clow wrote to Ronald Lewin, Head of Home Service, to note:

I have just heard that scientists of F.R.S. level have lobbied [G.P. Wells] to see if I would include them in the panel. Surely the hallmark of acceptance! I am, in fact, continually astonished to learn how many scientists follow what we are doing.¹⁰⁰

This was perhaps a bit of vindication for Clow after management had rejected his assertion in 1946 that his approach to broadcasting would provide a valuable service to the public while at the same time enhancing the BBC's reputation with the world of science.

Of course, gaining acceptance from the science world was of secondary concern to Clow; what he most cared about was ensuring that the BBC was providing a valuable service for the public in the form of informative and worthwhile science programming on multiple levels and for multiple audiences. He was pleased, therefore, when audience research showed that the Light Programme audience appreciated the new series. "There must be an enormous demand for straightforward and simple scientific information", Clow wrote to Chief Assistant, Talks (Sound) in January 1957: "I feel we have really struck something very useful indeed."¹⁰¹ As *Who Knows?* took its place within the wider spectrum of science programming offered by the BBC – science features, natural history programming, *Science Survey*, science programming on the Third, etc. – it filled in the gap that had existed at the 'lower end of the broadcasting spectrum' from 1952 to 1956. By meeting this demand, Clow could finally say that the BBC was indeed providing a valuable public service for all sections of the BBC audience.

What is more, Clow took the success of *Who Knows?* as yet more proof that the BBC had become one of the premier communicators of science in the country. In the autumn of 1958 he asserted that *Who Knows?* was "providing listeners with a public service that they can get nowhere else in the country",¹⁰² and in 1959 he boasted that his archive of thousands of listener questions was "the finest index in the country of what the public wants to know about science and

¹⁰⁰ Archie Clow to Head of Home Service, "Who Knows?," Memorandum, (April 10, 1962), R51/972/1, Written Archives Centre.

¹⁰¹ Clow to Chief Assistant Talks (Sound), "Who Knows?"

¹⁰² Clow to C.T., "The Future of 'Who Knows?'"

technology.”¹⁰³ Two years later he concluded: “No other organisation in the country knows as well what the public wants to know about science, or what sections of the public will turn to the Corporation for scientific information.”¹⁰⁴

Back in 1946 when Clow had attempted to overhaul *Science Survey*, Grisewood and Rendall had rejected Clow’s assertion that it was the duty of the BBC as a public service broadcaster to actively disseminate information about science to the public rather than simply serve as a platform for scientists. Thirteen years later, the BBC was still relying on scientists for their expertise, but series like *Who Knows?* and *Is There a Doctor in the House?* signaled a growing emphasis on mediating science and scientists for the general audience. This trend toward mediation would grow even stronger during the 1960s.

7.5. ‘*Science Review*’: from straight talks to interviews

This shift toward mediation was not exclusively a Light Programme phenomenon. Its impact on the Home Service is demonstrated most succinctly by *Science Review* – a series developed by Clow which ran from 1957 to 1967. Originally billed as a collection of talks by eminent scientists on “the events of the past month in the world of science and technology”, the series was intended to be a place where scientists could “report and comment” on recent or topical developments in science that might have otherwise been passed over by *Science Survey*.¹⁰⁵ As such, the series was essentially an extended version of *Science Survey* with slightly shorter and slightly more topical talks by practicing scientists – indeed, the series initially launched in January 1957 within *Science Survey* as a thirty minute, monthly broadcast entitled ‘Science Survey: Review of the Month’.¹⁰⁶

By the time the series broadcast its last programme in June 1967– six months after its tenth anniversary – the series had undergone a dramatic transformation. It was no longer a loosely-knit collection of five-minute science talks delivered by practicing scientists, but a more fast-paced and wide-ranging radio magazine composed primarily of interviews with scientists. One of the most obvious changes to the series occurred in the autumn of 1959 when Clow replaced the original presenter of the series, Alvar Lidell. The BBC’s written archives do not shed

¹⁰³ Archie Clow to Miss L. Moore, “‘Who Knows?’: Departmental Playback,” Memorandum, (September 11, 1959), R51/972/1, Written Archives Centre.

¹⁰⁴ Clow to C.P.P.(S), “Who Knows?,” 1.

¹⁰⁵ “Science Review,” *The Radio Times*, no. 1768 (September 27, 1957): 50.

¹⁰⁶ “Review of the Month,” Radio Broadcast, *Science Survey* (BBC Home Service Basic, January 31, 1957).

light on Clow's thinking in this regard, but it is worth noting that Clow assumed the role of presenter during the same period in which Hugh Chignell identifies a trend toward presenters who: a) could anchor a programme through force of personality; b) knew the subject matter backwards and forwards; and c) could contribute to the production of material.¹⁰⁷ Lidell would retire in 1969 as one of the most famous and well-respected BBC newsreaders of his generation, so he was more than likely capable of satisfying the first requirement. However, like Sam Pollock – who, as discussed above, was replaced by G.P. Wells as chairman of *Who Knows?* in the autumn of 1958 – Alvar Lidell knew little about science. Clow, on the other hand, was both a trained scientist and a seasoned broadcaster. What is more, as the producer of *Science Review*, Clow had almost certainly been writing Lidell's scripted material. Taking over as presenter in order to read his own material likely would have seemed quite natural, and was in keeping with the general trend of the time within the BBC.

With Clow firmly established as the new face – or voice – of *Science Review*, the series began moving away from its roots as a collection of short talks by practicing scientists. In much the same way that the chairman of *Who Knows?* was installed to mediate scientists for the audience, Clow moved to mediate scientists by increasingly conducting interviews rather than handing scientists a five or seven minute slot to deliver a straight talk. In doing so, Clow became much more than the provider of 'introduction and linking' material that Lidell had been as chairman. Indeed, Clow conducted more interviews during his first six episodes, than Lidell had during his two and half years in the *Science Review* chair.¹⁰⁸

Within these interviews, Clow strove to keep scientists at the right level, called for clarification on difficult points and guided scientists along. This was a role Clow was quite practiced at since for every summer since 1955 he had served as presenter of *Scientists in Session*, a highlight reel of sorts for the summer meeting of the British Association for the Advancement of Science. In a broadcast from the BAAS meeting in Bristol on 8 September 1955, for instance, Clow attempted to help the physicist A.H. Cottrell explain the process behind the formation of gas pockets in heated metal by interjecting: "And this, presumably, makes the metal swell up like

¹⁰⁷ Chignell, *Public Issue Radio*, 84–87.

¹⁰⁸ During Lidell's two and a half seasons (26 broadcasts) as chairman he conducted 28 interviews for an average of just over one interview per broadcast. Over Clow's first season (10 broadcasts) as chairman he conducted 41 interviews for an average of over four interviews per broadcast. David Edge also conducted a handful of interviews during the 1959 season.

a cake when you bake it?”¹⁰⁹ In a 3 September 1965 broadcast from the BAAS meeting in Cambridge, Clow paused an interview with D.G. James of the Meteorological Office in order to provide the audience with his own explanation of a “radiation budget”. Having done so, he asked the meteorologist to continue.¹¹⁰

Clow’s efforts at mediation appear to have been appreciated by listeners and critics alike. In February 1965, J.D.S. Haworth, critic for *The Listener*, complimented *Science Review* and expressed admiration for way in which Clow “so unerringly hit off the compromise between the ‘expert’ and the ‘popular’ which such programmes must make.”¹¹¹ Later that year, Haworth again commended Clow for his efforts to keep scientists at the right level, noting appreciatively that when interviewing scientists, Archie Clow had “small tolerance for scientific jargon”.¹¹² Haworth explained that when a scientist whom Clow was interviewing casually used the term ‘post-hypnotic suggestion’, the scientist was “immediately called to explain himself.”¹¹³

During the first few years of the 1960s, however, these interviews were far from probing or challenging. In fact, the majority of these interviews were heavily scripted in a process that gave scientists most of the control over framing and content. Due in part to the difficulty and high cost of recording, most programmes on BBC radio during the early post-war period were broadcast live rather than pre-recorded.¹¹⁴ As a result, most producers during this time opted for scripted interviews; the age when an unscripted interview could be recorded, edited, and inserted into a longer programme would come later.

These scripted interviews would generally take one of two forms: an organic, off-air interview that was then transcribed, tidied up, and re-read live on-air by the original interviewer and interviewee; or what, in essence, amounted to a scripted talk with leading questions inserted to give the appearance of an interview. Briggs notes that many interviewees during the first decade and a half of the post-war period were able to script their own interviews which not only allowed them to dictate the questions they wanted to be asked but to prepare responses to those questions. For example, Briggs explains that in 1956 upon receiving an invitation to be

¹⁰⁹ Archie Clow, Microfilm Script, *Scientists in Session* (BBC Home Service Basic, September 8, 1955), 5, Radio Talks Scripts Pre-1970 (Film T81), Written Archives Centre.

¹¹⁰ Archie Clow, Microfilm Script, *Scientists in Session* (BBC Home Service Basic, September 3, 1965), 3, Radio Talks Scripts Pre-1970 (Film T81), Written Archives Centre.

¹¹¹ J.D.S. Haworth, “Questions of Technique,” *The Listener*, no. 1872 (February 11, 1965): 240.

¹¹² J.D.S. Haworth, “The Spoken Word - Clichés and Jargon,” *The Listener*, no. 1902 (September 9, 1965): 392.

¹¹³ Haworth, “The Spoken Word - Clichés and Jargon,” 392.

¹¹⁴ Briggs, *Sound and Vision*, 4:532.

interviewed by the BBC, Lord Salisbury wrote to his contact at the Foreign Office: “If thought desirable will give two minutes interview at London Airport. Will bring draft questions and answers for consideration.”¹¹⁵

During the first fifteen or so years of the post-war period, interviews of scientists tended to take a similar form. A letter from Howard Florey to Ian Cox in 1946 gives a good indication of how this process worked. After receiving a request to take part in an interview for Cox’s *Science Survey*, Florey wrote to Cox to explain that if he were to agree, he would expect to be in charge of the subject matter and would produce a general outline of the direction and content of the interview. Once he had done so, Florey explained, Cox would, of course, be free to “produce all the little chatty bits and questions”.¹¹⁶ Cox agreed, and, after inserting his ‘chatty bits’, passed the scripted interview back to Florey for final approval.¹¹⁷ Fourteen years later, the process was still very much the same. In December 1960 Clow explained his approach to interviews in a letter to John Treherne in which he invited the zoologist to take part in an interview for *Science Review*. “What I have in mind”, wrote Clow, “is a piece about eight hundred words long, interspersed with two or three questions for me so as to break it up and help to lead you on.”¹¹⁸

A script that had originally been written as a straight talk could even be transmuted into an interview by inserting questions throughout the talk. The typewritten script for a contribution to *Science Review* by L.J. Richards of the Thornton Research Centre in Cheshire, for example, shows that Richards had been set to end his appearance with a seven paragraph explanation of recent developments in combatting engine wear. Prior to the broadcast, however, Clow decided to insert a handwritten question to break up the large chunk of explanation. As a result, that section of the script went from this:

Richards: ... we can now calculate the temperature received at the points between
can and tappet. The basic principles behind these calculations were put
forward by [a Professor at] Delft University.¹¹⁹

¹¹⁵ PRO FO 953/1640, cables of 17, 20 February 1956. Cited in Briggs, *Competition*, 5:166.

¹¹⁶ Howard Florey to Ian Cox, Letter, (October 10, 1946), RCONT1 Florey, Howard (1941-1962), Written Archives Centre.

¹¹⁷ Ian Cox to Howard Florey, Letter, (October 11, 1946), RCONT1 Florey, Howard (1941-1962), Written Archives Centre.

¹¹⁸ Archie Clow to John Treherne, Letter, (December 16, 1960), RCONT1 Treherne, John E. (1959-1962), Written Archives Centre.

¹¹⁹ Microfilm Script, *Science Review* (BBC Home Service Basic, November 11, 1960), 4, Radio Talks Scripts Pre-1970 (Film T462), Written Archives Centre.

To this:

- Richards: ... we can now calculate the temperature received at the points between
can and tappet.
- Clow: Is this a new way of approaching the problem?
- Richards: No, the basic principles behind these calculations were put forward by
[a Professor at] Delft University.¹²⁰

Many of Clow's interviews contained similarly disingenuous questions, and many commentators and critics picked up on it – and disliked it. Although Lois Mitchison, critic for *The Listener*, commended Clow for making “a brisker scientific disc jockey”¹²¹ of *Science Review*, she nonetheless criticized the series for too often sounding scripted and rehearsed. In May 1963, after listening to Clow interview Professor Charles Gray about his recent work on rheumatism, she lamented that Gray seemed to be reading his account “with brief pauses for equally obviously prepared questions to be inserted in his material”.¹²² “Can scientists be found who will talk more slowly, hesitate, give the impression, even if incorrectly, of improvising?” she asked.¹²³

Not only were scientists afforded a high degree of control over the scripting of interview content, but the BBC also went to some lengths to assure scientists that the goal of the *Science Review* interview was not to challenge the authority of scientists or make them appear unknowledgeable or unprepared. Indeed, in 1962, J.A. Camacho, Head of Talks and Current Affairs (Sound), responded to criticism from the DSIR by noting that although *Science Review* was “increasingly [...] presented in the form of a series of interviews rather than straight talks”, the interviews were “not designed to expose weakness or uncertainty but to elicit information and ensure understanding on the part of the listener.”¹²⁴

Like *Who Knows?* on the Light Programme, *Science Review* shows the Home Service following the same trend towards the mediation of scientists. During the first half of the 1960s, what had been a series of straight talks became a magazine series based around interviews. Yet in its style of interviewing and in the way the interviews were produced, the series remained deferential in its treatment of scientists. It would take a few more years, and a few more developments within the BBC, for the idea of a probing or unscripted interview to catch on.

¹²⁰ November 11, 1960, 4.

¹²¹ Lois Mitchison, “The Spoken Word - Revived Regulars,” *The Listener*, no. 1802 (October 10, 1963): 584.

¹²² Lois Mitchison, “The Spoken Word - Difficult Science,” *The Listener*, no. 1780 (May 9, 1963): 804.

¹²³ Mitchison, “The Spoken Word - Difficult Science,” 804.

¹²⁴ J.A. Camacho, “Science Broadcasts,” November 14, 1962, 2, R6/239/1, Written Archives Centre.

Chapter 8:

Science in News and Topical Programming

On 2 May 1959, *Nature* announced that C.L. Boltz would soon be leaving his role as science correspondent for the European Service, to become a science correspondent at Broadcasting House.¹ The journal explained that the new post would be “comparable to that of the [News] Division’s diplomatic and industrial correspondents” and proclaimed that the domestic services could not have found a better person for the role.² “Few people have had so wide an experience of science broadcasting”, the journal wrote:

... for during the time he has been broadcasting from Bush House he has covered a vast range of scientific topics. Among European listeners he has a great reputation and he is one of the most popular broadcasters to give talks at Bush House.³

The BBC’s domestic radio services had never before employed a science correspondent, however, so there was some uncertainty about the role Boltz should inhabit. Over the next decade the BBC slowly developed an approach that proved useful – so useful that in 1969 R.D’A. Marriot, Assistant Director (Radio), informed a group of scientists that the 1970s would bring “increased opportunities for science news” on speech radio.⁴ Radio was, Marriot explained, “particularly suited” to the presentation of science news.⁵

The development of science news over this period both mirrored the trend towards a more mediated approach to science spoken-word science programming discussed in the previous chapter, and established a precedent for the emergence of a more hard-hitting interrogative approach to such programmes (see Chapter 9). Such changes also paralleled developments within the BBC’s other news services as the long-standing forced separation of news from

¹ “Science Correspondent of the B.B.C.: Mr. C.L. Boltz,” *Nature* 183, no. 4670 (May 2, 1959): 1231.

² “Science Correspondent of the B.B.C.: Mr. C.L. Boltz,” 1231.

³ “Science Correspondent of the B.B.C.: Mr. C.L. Boltz,” 1231.

⁴ “Science Consultative Group - Note of a Meeting Held on Friday, 7 November 1969,” January 1, 1970, 7, R78/76/1, Written Archives Centre.

⁵ “Science Consultative Group - Note of a Meeting Held on Friday, 7 November 1969,” 7.

comment was rescinded. To understand this shift within science broadcasting during the late 1950s and early 1960s one must therefore first understand the changes that news broadcasting underwent over that same period.

8.1. *News versus current affairs*

As discussed in Chapter 1, for the first three plus decades of the BBC's existence there was a strict demarcation between 'news' and 'comment'. This demarcation led to, and was in many ways caused by, wide-spread suspicion within the BBC of journalists and journalistic values (see Chapter 1.3). Perhaps not surprisingly, this demarcation was engrained into early post-war television news as well. Briggs writes that on the television side, Tahu Hole, Editor, News, "took it for granted that there was a division inside the BBC between news, which should be objective and unadulterated, and current affairs, which could be explanatory and speculative" – "a distinction", Briggs clarifies, "which was not drawn in the United States".⁶ Whereas American broadcasters like Edward R. Murrow – who had impressed Americans and Britons alike with his war-time reports from London – often took part in the researching and writing of their own material and had the freedom to express their own personal views within a broadcast, for the first decade of the post-war period BBC newsreaders not only had their scripts written for them, but were both unnamed and unseen.⁷ It was only in September 1955 that newsreaders were actually shown to the viewing public – though they were still unnamed.⁸ Even after making this concession, Hole maintained that to further 'Americanize' the news by letting newsreaders develop their own material or offer their own personal views, would be disastrous.⁹ According to Hugh Chignell, 'Americanize' was at the time, "one of the worst slurs that could be used against the BBC."¹⁰

When, in the latter half of the 1950s, the drive to combine news and comment came, it came not from the domestic services, but from overseas. As a result of typical BBC inter-departmental competition, the production of overseas news remained separate from the production of domestic news for the first decade of the post-war period. The differences between the two services were so stark that Briggs identifies "a separation, even a dichotomy, in

⁶ Briggs, *Competition*, 5:69.

⁷ Briggs, *Sound and Vision*, 4:544.

⁸ Briggs, *Competition*, 5:63.

⁹ Briggs, *Competition*, 5:69.

¹⁰ Chignell, *Key Concepts*, 32.

attitudes and styles in News organization and delivery in the Home and External Services”.¹¹ In his autobiography, Ian Trethowan explained: “The idea of an experienced specialist journalist explaining the events, or interviewing one of the participants to try to elicit more from him, was only grudgingly accepted, and mainly from abroad, through the BBC’s excellent foreign correspondents”.¹² The only domestic series to take a comparable approach during the first decade of the post-war period was *Radio Newsreel* – a series which, according to Briggs, was at its best when it made use of the BBC’s own foreign correspondents.¹³

Influenced by the popularity and success of this overseas approach – as well as by the arrival of ITV in 1955¹⁴ – by the late 1950s there was growing interest both within the domestic audience and within the BBC for the broadcasting of *views* as well as news.¹⁵ Perhaps no series better reflects this change than the BBC television series, *Panorama*. Though the series debuted in 1953, it reached new heights of importance and popularity in 1955 when the journalist and former war correspondent, Richard Dimbleby, took over as chairman and began blurring the line between news and comment.¹⁶ Dimbleby inhabited a role quite similar to Edward R. Murrow and, according to Briggs, became an institution unto himself.¹⁷ By doing so, the series was answering previous calls from people such as Burton Paulu for BBC presenters who could interpret and explain events rather than serve as mere readers of news. Importantly, the series also stressed topicality and regularly utilized correspondents or ‘contributors’. Chignell sums up the situation at the dawn of the 1960s:

By the end of the 1950s many of the building blocks of contemporary current affairs radio were in place: a commitment to topicality and the magazine format, a rejection of the didactic and improving talk, a gradual awareness of the need for presenters who could anchor the programme and a weakening of the old news/talk (or current affairs) division.¹⁸

This ‘weakening’ of the divide between news and comment within the BBC would have a profound effect on science programming.

¹¹ Briggs, *Sound and Vision*, 4:527.

¹² Ian Trethowan, *Split screen*. (London: Hamish Hamilton, 1984), 80. Cited in Chignell, *Public Issue Radio*, 67–68.

¹³ Briggs, *Sound and Vision*, 4:528.

¹⁴ See Chapter 1.5 in Briggs, *Competition*.

¹⁵ Briggs, *Competition*, 5:547.

¹⁶ Chignell, *Public Issue Radio*, 79. See also Briggs, *Competition*, 5:165.

¹⁷ Briggs, *Competition*, 5:165.

¹⁸ Chignell, *Public Issue Radio*, 79.

8.2. ‘diluted with journalism to a degree’

Despite Clow’s frequent assertions that the BBC should employ ‘competent publicists’ to step in and communicate science on behalf of non-radiogenic scientists, during the first decade of the post-war period Clow appears to have shared the wide-spread and deeply ingrained suspicion within the BBC of ‘news men’ and journalism – particularly American-style journalism. Indeed, in 1948 Clow had closed a letter to the molecular biologist W.T. Astbury by noting: “on the whole [in the U.S.] there doesn’t seem to be a steady output of, I hope I can use the adjective, reputable, broadcasts like Science Surveys.”¹⁹ W.M. Newton, Assistant Director, Talks, would have likely agreed with this view; in 1947 he had written to Clow to inform him that although he had been receiving the scripts of science programmes broadcast by the American network CBS (Columbia Broadcasting System), he was disappointed to find that they were “diluted with journalism to a degree.”²⁰

In Clow’s mind the negative effects of journalism and journalistic values were not localized solely to the United States. In January 1950, he wrote to Mary Somerville, then Acting Controller, Talks, and argued that it was worth ensuring that the BBC’s statements on science remained “reliable and of considerable interest value rather than startling and flamboyant [...] if for no other reason than that the penny press [in the U.K.] is still prone to irresponsibility when it hears of any new discovery of moment.”²¹ Thus, for Clow, the BBC’s sober and reliable science programmes were a counterweight to the more sensationalized reports from the less reputable papers.

Many practicing scientists during this time appear to have harbored a similar distrust of journalism. According to Jacob Bronowski – who would go on to present the BBC television series *The Ascent of Man* in 1973 – science journalists tended to embellish their reports and tended to focus too much attention on the achievements of applied science at the expense of the methods of science or equally important developments in ‘pure science’. In 1947, for instance, Bronowski wrote to the BBC to pitch an idea for a series that would act as a counterweight to

¹⁹ Archie Clow to W.T. Astbury, Letter, (January 6, 1948), RCONT1 Astbury, W.T., Written Archives Centre. Clow had received this view from none other than Waldemar Kaempffert, science editor of the *New York Times*. According to Clow, during a discussion at the 1947 BAAS meeting in Dundee, Kaempffert informed him that there was “nothing in the United States to equal [the BBC’s] steady flow of science broadcasts.” Archie Clow to D.T., “Putting Science on the Air,” October 16, 1947, R51/523/6, Written Archives Centre.

²⁰ Handwritten note on Clow to D.T., “Putting Science on the Air.”

²¹ Archie Clow to A/C.T., “Science Broadcasts,” Memorandum, (January 31, 1950), RCONT1 Walter, William Grey (1948 - 1962), Written Archives Centre.

bad science journalism by focusing on “the general concepts and methods of science”.²² “[W]e must get rid of the salesmanship of this or that insignificant fragment of research which is a method of scientific journalism”, Bronowski wrote.²³ Alex Comfort, the British physician, poet, and novelist – and eventual bestselling author of *The Joy of Sex* – once even (perhaps playfully) chastised David Edge, a BBC science producer, for taking what he thought were too many journalistic liberties. In May 1960 Edge wrote to Comfort to apologize for inserting the phrase “mopping up the residues” into Comfort’s script for a talk on ‘Darwin and Freud’.²⁴ “My journalistic vulgarisms” Edge wrote, “stand justly condemned”.²⁵

As late as 1964, the BBC was reassuring scientists that the domestic services remained committed to utilizing scientists as communicators of science rather than utilizing journalists or writers. That year the BBC established the Science Consultative Group (SCG) – a twice annual meeting between elite scientists from across the scientific spectrum and BBC personnel involved in the production of science programming – in an effort to facilitate communication between the world of science and the BBC. At the inaugural meeting of the group on 29 May 1964, the BBC circulated a memorandum which explained that “the policy of the BBC [...] on the whole” was to “use the working scientist, accepting the risk of failure, rather than the science writer or journalist with secondhand knowledge who may be more accomplished at ‘putting it across’.”²⁶ The memorandum admitted that scientists who were capable of combining “an authoritative knowledge” of a subject with the ability to make that subject “both comprehensible and interesting in lay terms” were “comparatively rare”, but gave no justification for why journalists or science writers were to be avoided.²⁷ The BBC’s history of distrusting journalists helps clarify the reasoning of BBC management, however. It was not simply that practicing scientists were deemed more prestigious and knowledgeable (see Chapter 4). Scientists, it was assumed, would communicate their research in the sober, responsible manner desired by the BBC; journalists, on the other hand, were wont to exaggerate, cause misunderstandings, and lead the public to adopt negative or unrealistic expectations of science. For the first two decades of the post-war period,

²² Assistant Director, Talks to Archie Clow, “Science Talks for the Third Programme,” August 28, 1947, R51/523/6, Written Archives Centre. The letter from A.D.T. included a long excerpt from a letter from Bronowski.

²³ Assistant Director, Talks to Clow, “Science Talks for the Third Programme.”

²⁴ David Edge to Alex Comfort, Letter, (May 27, 1960), RCONT1 Comfort, Alex (1953-1962), Written Archives Centre.

²⁵ Edge to Comfort, May 27, 1960.

²⁶ “Science Consultative Group - Broadcasting about Science and Technology,” May 1964, 1, R6/239/2, Written Archives Centre.

²⁷ “Science Consultative Group - Broadcasting about Science and Technology,” 1.

official Talks department policy was to avoid such a dangerous approach to science programming on its domestic services.

8.3. *C.L. Boltz, BBC Science Correspondent*

In the same way that the BBC's first dedicated news correspondents were employed by the overseas services rather than the domestic home services, the first dedicated science correspondents on the BBC's payroll plied their trade overseas. As mentioned above, C.L. Boltz would become the first official science correspondent for the BBC's domestic services in 1959, but for a decade prior Boltz had been contributing reports on the world of science for the European Service and General Overseas Service: by 1949 he was contributing to overseas science programmes as a free-lance science journalist;²⁸ by 1952 he was an official science correspondent for the European Service;²⁹ and by 1953 he was contributing a weekly eight minute report on a "topical science subject" and a weekly 15 minute report on a "less topical one."³⁰

Much of Boltz's work was broadcast in the 'General News Talk' slot of the European Service, yet due to the fast-paced nature of news, the high cost of recording, and the peculiarities of mid-twentieth century BBC records keeping, few recordings of these news broadcasts were ever made, and few of Boltz's scripts were sent to the archives. Thankfully, however, many of Boltz's contributions were later rebroadcast within a G.O.S. science series, the scripts for which found their way into the BBC's archives. The series in question, also entitled *Science Review*, was produced by the long-serving producer, Rosemary Jellis, and consisted of 15-minute talks and reports on topical developments in science.³¹ Despite the identical names (at one point in 1956 there were three different 'science reviews' across the BBC's various domestic and overseas services!)³² Jellis's G.O.S. *Science Review* was quite different from Clow's Home Service *Science Review*. Most importantly, Jellis' version regularly featured reports from science journalists. Influential early science journalists such as A.W. Haslett, Ritchie Calder, John Maddox, Clifford Troke, Magnus Pyke, John Davy, and C.L. Boltz all made appearances during the mid-1950s.

²⁸ Rosemary Jellis to Mrs. Kirwan, "Talks Booking Requisition - General Overseas," Receipt, (April 29, 1949), RCONT1 Boltz, C.L. (1940-1962), Written Archives Centre.

²⁹ "Science Correspondent of the B.B.C.: Mr. C.L. Boltz," 1231.

³⁰ Postgate to C.T.(H.S.), "Science Proposals."

³¹ The series began as *Science Notebook* but switched to *Science Review* in March 1948.

³² Aside from the G.O.S. *Science Review* and Home Service *Science Review*, there was also a long-running Scottish *Science Review* produced by the long-serving producer, Harry Hoggan.

Even Archie Clow himself appeared in the series, contributing a report on ‘Science in the Soviet Union’ in 1955,³³ and a report on ‘The International Congress on the Protection of Nature’ in 1956.³⁴ For the latter, he was introduced as a ‘BBC science correspondent’.

Within these overseas broadcasts, science correspondents appear to have taken – and, perhaps more importantly, been allowed to take – comparatively more narrative and linguistic liberties than scientists who appeared on the domestic services. Thus, whereas Alex Comfort recoiled at the phrase ‘mopping up the residues’, Boltz kicked off an August 1956 news report with the rather startling pronouncement: “I have to admit that I am a drug addict. What is more – so are you. And so is everybody in the civilized world.”³⁵ “At this very moment”, he continued, tongue planted firmly in cheek:

... thousands – perhaps millions – of British people are taking the dried and bruised and broken leaves of a sort of oriental camellia and making from them an infusion with boiling water to dissolve out the drug.³⁶

“In other words, they are making tea.”³⁷ Such novel passages were commonplace in the scripts of not only Boltz, but all the science correspondents who made their living on the overseas services.

When one of these science journalists did appear on the domestic services during this period it tended to be for either a ‘year in review’ programme – Boltz, Haslett, and Troke all appeared in *Science Survey* in 1951 for just such a programme³⁸ – or because no suitably ‘radiogenic’ expert could be found. Thus, when, in October 1950, Clow wrote to Boltz to ask him to deliver an illustrated and somewhat light-hearted *Science Survey* talk on electrophonic organs to mark the coming holiday season, Clow explained: “Possibly you will say you are not an expert but I think it also pretty certain that the experts can’t talk”.³⁹ Nonetheless, appearances by science journalists within *Science Survey* were the exception. During the eleven years from May 1946 through April 1957, fourteen *Science Survey* broadcasts included a contribution from a

³³ Archie Clow, “Science in the Soviet Union,” Microfilm Script, *G.O.S. Science Review* (General Overseas Service, December 19, 1955), Radio Talks Scripts Pre-1970 (Film T461), Written Archives Centre.

³⁴ Archie Clow, “The International Congress on the Protection of Nature,” Microfilm Script, *G.O.S. Science Review* (General Overseas Service, July 10, 1956), Radio Talks Scripts Pre-1970 (Film T462), Written Archives Centre.

³⁵ C.L. Boltz, “Tea - The National Drug,” Microfilm Script, *European Service - General News Talk* (General Overseas Service, August 21, 1956), 1, Radio Talks Scripts Pre-1970 (Film T462), Written Archives Centre.

³⁶ Boltz, “Tea - The National Drug,” 1.

³⁷ Boltz, “Tea - The National Drug,” 1.

³⁸ “Scientists’ Year,” Radio Broadcast, *Science Survey* (BBC Home Service Basic, December 20, 1951).

³⁹ Archie Clow to C.L. Boltz, Letter, (October 10, 1950), RCONT1 Boltz, C.L. (1940-1962), Written Archives Centre.

science journalist, correspondent or communicator. For the two years from January 1955 through December 1956, alone, the tally for the G.O.S. *Science Review* was 34.

Despite the lack of a dedicated science news service on BBC radio, a 1957 survey of audience attitudes towards the BBC's news services had seemed to indicate that a market existed on the domestic services for such an offering. The most requested news items were pieces on "accidents and disasters" with news reports on the weather coming in third. Sandwiched between the two were ("somewhat surprisingly" according to Briggs⁴⁰) requests for news about "science and technology".⁴¹ In the years that followed the publication of this report, the BBC began officially looking for a science correspondent to meet this demand, and by the spring of 1959 had selected C.L. Boltz.⁴²

The new position of Science Correspondent sat in the News Division and therefore did not report to Clow, but even before the new position was advertised, Clow expressed his hope that whomever was hired would work closely with him and the Talks department. Clow foresaw that the new position would signal a shift in the BBC's approach to domestic science programming. Thus, at an October 1958 meeting of BBC personnel involved in the production of science programming, Clow noted that he hoped the new position of Science Correspondent would "liaise closely with Talks Division" since such an appointment would "represent a departure from the precedent that science broadcasts should be provided by scientists themselves."⁴³ Speaking later at the same meeting, C.L. Boltz – who had not yet been selected for the position – noted that in his mind such a departure could indeed be achieved, and could be achieved with very little difficulty. According to the minutes of the meeting, Boltz advised his colleagues that "almost any producer could deal with a scientific subject without any obligation to refer for advice to experts who might recommend the right speakers or the right treatment."⁴⁴ Here, then, was someone who did not feel constrained by three decades of BBC precedent. For Boltz – and others like him – the production, planning, writing and even *delivery* of science programmes could be understood as falling in the domain of the professional science producer,

⁴⁰ Briggs, *Competition*, 5:71.

⁴¹ Audience Research Department, "Audience Research Report: 'The News: A Study of News Listening and Viewing and of the Public's Attitudes Towards the BBC's News Service'," June 1957, 5–10. Cited in Briggs, *Competition*, 5:71.

⁴² It is not clear when exactly Boltz bolted Bush for Broadcasting House, but he must have secured his new role by late April 1959 for it was on 2 May 1959 that *Nature* congratulated C.L. Boltz on becoming the BBC's first domestic 'science correspondent'.⁴² "Science Correspondent of the B.B.C.: Mr. C.L. Boltz," 1231.

⁴³ Shaw, "Science Broadcasts - Notes of a Meeting on Wednesday, 22nd October, 1958," 1.

⁴⁴ Shaw, "Science Broadcasts - Notes of a Meeting on Wednesday, 22nd October, 1958," 2.

broadcaster, or correspondent. This struggle over who was qualified to deliver science programmes on BBC radio can be seen as an example of the professionalization of the BBC science broadcaster.⁴⁵ In this instance, Boltz was not only acting as a gatekeeper of what it meant to be a professional science broadcaster, he was actively arguing for an extension of the domain controlled by his budding profession.

Once again, due to a lack of records related to news programming, it is difficult to trace Boltz's work during his first few months at Broadcasting House. But from a job advertisement for the position published in *New Scientist* it is known that Boltz was expected to contribute "brief reports and talks suitable for the ordinary listener" in news and topical programmes on both television and radio.⁴⁶ On 30 October 1959 he launched perhaps his most novel venture when he debuted the Home Service series, *Science News*, a weekly, five minute news-style report on developments in the world of science. From 10:55 to 11:00 each Friday evening Boltz reported on events such as: a recently released report on "the relation of alcohol to road accidents";⁴⁷ a hospital outbreak of *staphylococcus*;⁴⁸ the need for "constant scientific vigilance" rather than "destructive criticism" when it came to discussions about "the balance of nature and man's interference with it";⁴⁹ and a post-Christmas report on recent unsuccessful attempts to identify the causes of indigestion.⁵⁰ For this last report, he closed with a quote from an American writer: "Perhaps [...] Mark Twain gave good advice when he said that the secret of success in life is to eat whatever you like and let the food fight it out inside."⁵¹ Boltz was conscious that *Science News* represented something new on the domestic services and saw his more journalistic reports as a "useful supplement" to the scientist-delivered programmes put out by Clow and the Talks department.⁵²

⁴⁵ For a discussion of the professionalization of BBC broadcasters see Tom Burns, *The BBC: Public Institution and Private World* (London: Macmillan, 1977). For a discussion of the professionalization of BBC science broadcasters see Jones, "Speaking of Science."

⁴⁶ "BBC Requires Science Correspondent," *The New Scientist* 4, no. 104 (November 13, 1958): 1289.

⁴⁷ C.L. Boltz, Microfilm Script, *Science News* (BBC Home Service Basic, January 22, 1960), 1, Radio Talks Scripts Pre-1970 (Film T459), Written Archives Centre.

⁴⁸ C.L. Boltz, Microfilm Script, *Science News* (BBC Home Service Basic, January 8, 1960), 1, Radio Talks Scripts Pre-1970 (Film T459), Written Archives Centre.

⁴⁹ C.L. Boltz, Microfilm Script, *Science News* (BBC Home Service Basic, January 15, 1960), 2, Radio Talks Scripts Pre-1970 (Film T459), Written Archives Centre.

⁵⁰ C.L. Boltz, Microfilm Script, *Science News* (BBC Home Service Basic, January 1, 1960), 2, Radio Talks Scripts Pre-1970 (Film T459), Written Archives Centre.

⁵¹ Boltz, January 1, 1960, 2.

⁵² Archie Clow to C.P.P. (S), "Home Service Science Broadcasting," May 26, 1960, R51/967/1, Written Archives Centre.

Boltz was not the only figure bringing about a more topical and journalistic approach to science programming, however. Indeed, even during the months that the BBC was contemplating advertising for a Science Correspondent, the domestic services had been rolling out news and topical programmes devoted to science. On 16 October 1958 – the same month that BBC personnel met to discuss the possibility of hiring an official science correspondent – BBC television launched the fortnightly series, *Science is News*, described by the *Radio Times* as “Television reports on discoveries in Science, Medicine, and Industry which are changing our world.”⁵³ Ten weeks later, on New Year’s Day 1959, the Light Programme began including a ‘Science Spot’ in its *News Summary Roundabout*.⁵⁴ The weekly ‘Science Spot’ often included talks by practicing scientists such as J.G. Porter, O.G. Edholm, Colin Butler, and Kenneth Oakley – all of whom were regulars in *Science Survey* – but more frequently featured reports by freelance science journalists. Many of the journalists who had frequently appeared in the G.O.S. *Science Review* contributed reports – among them A.W. Haslett, John Maddox, Ritchie Calder, and John Davy – as did a few additional journalists and communicators such as John Hillaby and Alastair Dunnett. Overall, 32 of the 59 programmes broadcast from 12 March 1959 to 24 November 1960 were delivered by science journalists or science communicators, while only 25 were delivered by scientists – of which four were delivered by BBC engineers.⁵⁵ As the BBC moved into the 1960s, the idea that science programmes could be delivered by science journalists who were perhaps better at ‘putting it across’ was slowly catching on.

Before the BBC could move into the 1960s, however, science on BBC radio underwent one more important reconstruction. On 31 October 1959, *Nature* announced that the BBC had established a ‘Science Unit’ in the Talks department with “the object of providing a more extensive coverage of science”.⁵⁶ Clow was to be made senior member of the group and would be joined by two secretaries and the recently hired David Edge, a graduate in physics from Cambridge who would predominantly look after the production of science talks for the Third Programme.⁵⁷ Boltz would remain in News Division, but would coordinate with the new Talks department unit. The creation of the new unit also came with a shiny new title: by the next year

⁵³ “Science Is News,” *The Radio Times*, no. 1822 (October 10, 1958): 19.

⁵⁴ “Science Spot,” Radio Broadcast, *News Summary Roundabout* (Light Programme, January 1, 1959).

⁵⁵ There were also two broadcasts for which the *Radio Times* did not include any details of that week’s speaker. This 20-month span was chosen because before and after this period the *Radio Times* listings for *News Summary Roundabout* do not include details of who presented that week’s ‘science spot’.

⁵⁶ “B.B.C. Science Unit,” 1361.

⁵⁷ Edge would go on to found the influential Science Studies Unit at the University of Edinburgh.

Clow was identified in BBC memoranda as ‘Senior Producer, Science Unit’.⁵⁸ A few years after that he was ‘Editor, Science Talks (Sound)’ – a title he would keep until his retirement in 1970.⁵⁹

8.4. *David Wilson: journalistic values and applied science*

Despite the fanfare accompanying Boltz’s appointment as science correspondent in the spring of 1959, by autumn of the next year Boltz had resigned his post, telling his colleagues that “the news outlets for science material did not justify a full time Science Correspondent”.⁶⁰ The position sat empty for over two years, but in the autumn of 1962 BBC management began to express interest in reviving the role. In November 1962, J.A. Camacho informed Assistant Director, Sound Broadcasting that he intended to “re-establish the post of Science Correspondent”,⁶¹ and later that month the BBC informed a meeting of scientists that the BBC had officially hired a “science graduate” to resurrect the role.⁶² Three months later David Wilson, the man appointed as the new Science Correspondent, appeared in *Science Review* in his new role to deliver a report on “the application of science and technology for the benefit of the less developed areas of the world.”⁶³ Two years after that the BBC hired Colin Riach to assist Wilson as a ‘Science Reporter’.⁶⁴

To call David Wilson a ‘science graduate’, however, was perhaps stretching the meaning of the term. He had, in truth, only briefly worked towards a mathematics degree at Cambridge before leaving for national service with the Royal Artillery in Sri Lanka.⁶⁵ Upon his return to Cambridge, Wilson switched his focus to history, and began honing his journalistic skills at the student newspaper.⁶⁶ It was only after working at the BBC “for some time” as a “general

⁵⁸ Clow to Treherne, December 16, 1960.

⁵⁹ Clow was ‘Editor, Science Talks (Sound)’ by at least the spring of 1964 when he was listed as such at the May 1964 meeting of SCG.

⁶⁰ “Extract from the Minutes of D.G.’s News and Current Affairs Management Meeting Held on Friday, 23rd September 1960,” Undated, R6/239/1, Written Archives Centre.

⁶¹ Camacho, “Science Broadcasts,” 3.

⁶² “Science Broadcasting - Notes by the BBC on Programme Organisation and Current Output,” November 28, 1962, 2, R6/239/1, Written Archives Centre.

⁶³ Microfilm Script, *Science Review* (BBC Home Service Basic, February 7, 1963), 9, Radio Talks Scripts Pre-1970 (Film T462), Written Archives Centre.

⁶⁴ Riach had been hired by at least October 1964. See R.D. Pendlebury to H.T.C.A.(S), “Science Consultative Group: Friday, 6th November, 1964,” October 12, 1964, R78/76/1, Written Archives Centre.

⁶⁵ Martin Adeney, “David Wilson,” *The Guardian*, September 19, 2000, sec. News, <http://www.theguardian.com/news/2000/sep/19/guardianobituaries2>.

⁶⁶ Adeney, “David Wilson.”

reporter” that he began “specialising in science stories” around the summer of 1962.⁶⁷ It is not clear why Wilson’s scientific credentials were embellished during the aforementioned meeting, but it may be that the BBC felt scientists would be more accepting of the still somewhat novel idea of a science correspondent if they knew the position was to be filled by a ‘science graduate’.

Regardless, it was not Wilson’s (short-lived and incomplete) scientific training which most recommended him to Camacho; it was his proven record as a journalist capable of thriving in the news and current affairs side of the BBC. Indeed, Camacho had disagreed with Boltz’s assessment in 1960 that there simply were not enough news outlets to justify a full-time Science Correspondent. For Camacho, Boltz’s scientific training had been a liability rather than an asset. In his November 1962 memo to the Assistant Director, Sound Broadcasting, Camacho wrote that the “experiment tried some years ago of appointing a scientist as Science Correspondent in the News Division was not successful substantially because [Boltz], though well respected in the scientific world, found it difficult to adjust himself to the needs of news.”⁶⁸ There was “no risk” in appointing Wilson, however, for Wilson had already shown himself to be “capable of adjusting his work to the needs of News Division.”⁶⁹ For Camacho, when it came to the makings of a good BBC science correspondent, experience as a journalist or ‘news man’ was just, if not more, important than scientific training.

Though there are few scripts or recordings of Wilson’s and Riach’s contributions to news and current affairs programmes like *Radio Newsreel*, *Tonight* or *Ten O’Clock*, it is possible to get a sense of these ‘needs of News Division’ by looking at a report entitled ‘Science in News and Topical Programmes’ which Wilson submitted to the SCG in April 1966. For starters, news-style reports on science had to be much shorter than talks. And short they were. In his report, Wilson noted that the standard time allotted to “an important, or ‘lead’ story” in a news bulletin was one minute – though this might be extended to two or three minutes in a “news magazine or highly topical programme”.⁷⁰

Additionally, a news report on science could not assume an interested, self-selected audience in the same way that *Science Survey* or *Science Review* could. Though Boltz had experimented with the weekly, five-minute series *Science News*, the BBC had since moved away

⁶⁷ Camacho, “Science Broadcasts,” 3.

⁶⁸ Camacho, “Science Broadcasts,” 3.

⁶⁹ Camacho, “Science Broadcasts,” 3.

⁷⁰ David Wilson, “Science Consultative Group - Science in News and Topical Programmes,” April 19, 1966, 2, R6/289/1, Written Archives Centre.

from the idea of a dedicated science news series. This meant that any report on science that Wilson might produce had to be interesting and newsworthy enough to justify being included in a general news programme's line-up. "Within this field", Wilson explained, "the broad ruling is that science items win their own place on the grounds of interest and significance."⁷¹ Or, as the BBC put it in 1962, news reports on science were "governed by normal news criteria".⁷² For Wilson, this policy had the advantage of bringing scientific matters "to the attention of those who might automatically reject any programme labelled 'science'."⁷³

These two realities of news-style reports on science – the severe time restrictions and the need to appeal to a general audience – convinced Wilson to focus his attentions on applied rather than pure science. On the one hand, the short amount of time allotted for reports on science meant that it was quite difficult to explain the science underpinning a new theory or fundamental discovery. "News must in theory be made comprehensible to every adult inhabitant of the country", Wilson explained: "Taking account of the time limitation, this makes it impossible to use certain stories of basic research in ordinary bulletins."⁷⁴ On the other hand, listeners to news and topical programmes were, according to Wilson, simply more interested in applied science:

In any consideration of the balance of the BBC's output of science it should be borne in mind that most viewers and listeners to the News are naturally interested in the applied, practical result, of research rather than in 'pure science'. There is, therefore, a weighting of output in daily news and topical programmes away from the scientists in the laboratory, towards the end-products of their work in the shape of export orders, marketing of new devices, and so on.⁷⁵

Wilson's discovery that listeners were more interested in applied science was not altogether unexpected, for P.E. Vernon and Robert Silvey had come to similar conclusions a decade and a half prior (see Chapter 6.5). The fact that Wilson weighted his output toward the applied end of the spectrum did, however, set Wilson's work apart from the work of Clow and his colleagues in the Science Unit who often strove for a balance between pure and applied science. In fact, in a 5 January 1967 broadcast of *Science Review*, Wilson highlighted the difference between his role as a Science Correspondent in News Division and Clow's role as a science

⁷¹ Wilson, "Science Consultative Group - Science in News and Topical Programmes," 2.

⁷² "Science Broadcasting - Notes by the BBC on Programme Organisation and Current Output," 2.

⁷³ Wilson, "Science Consultative Group - Science in News and Topical Programmes," 2.

⁷⁴ Wilson, "Science Consultative Group - Science in News and Topical Programmes," 2.

⁷⁵ Wilson, "Science Consultative Group - Science in News and Topical Programmes," 3.

producer in the Talks department. Clow had invited Wilson to join him on the programme to “compare notes on some of the most memorable events of 1966 in science and technology.”⁷⁶ The two men traded their personal highlights which ranged from photographs of the moon taken by Lunar Orbiter 2 to the production of the first synthetic protein.⁷⁷ After Clow mentioned the apparent identification of background radiation from the Big Bang, Wilson commented:

Yes, I agree very much with you there [...] it interested me enormously. Most of the things you’ve picked out today have been more fundamental than the ones I’ve picked out. I suppose this is, of course, LAUGH my job tends to differ from yours.⁷⁸

The telediphone script for the programme records that Clow indicated his agreement with a long grunt of approval.⁷⁹

The hiring of Wilson in 1962 signaled a concerted effort on the part of the BBC to increase the coverage of science in its news and current affairs programming. Indeed, at the first meeting of the SCG in May 1964, the BBC explained:

The treatment of scientific information as ‘news’, in topical programmes [...] and in the News and newsreels, is perhaps the surest way of bringing [scientific information] to the notice of the largest number of people, and some expansion in this direction is planned.⁸⁰

By November 1965 the BBC could report to the SCG that news reports on science had indeed “expanded markedly in recent years”.⁸¹ One year later Wilson informed the SCG that over the previous year he and Riach had delivered 318 reports on science between them.⁸² What is more, this total of 318 reports did not include the numerous reports on scientific matters that were delivered by other BBC personnel or outside contributors. Indeed, Wilson’s report noted that topical magazine programmes carried “many more items related to science and technology which come from other sources, notably from industrial correspondents and general reporters in the

⁷⁶ Microfilm Script, *Science Review* (BBC Home Service Basic, January 5, 1967), 1, Radio Talks Scripts Pre-1970 (Film T463), Written Archives Centre.

⁷⁷ January 5, 1967, 1–4.

⁷⁸ January 5, 1967, 4.

⁷⁹ January 5, 1967, 4.

⁸⁰ “Science Consultative Group - Broadcasting about Science and Technology,” 2.

⁸¹ “Science Consultative Group - Radio Coverage of the British Association Annual Meeting,” November 10, 1965, 2, R6/289/1, Written Archives Centre.

⁸² Wilson, “Science Consultative Group - Science in News and Topical Programmes,” 3.

regions, and from science journalists.”⁸³ The topical radio magazine, *Today*, for instance had carried “some twenty to thirty” such items in addition to the 22 delivered by Wilson and Riach.⁸⁴ The number of science reports in news and topical programming was on the rise, and, importantly, they were being delivered by BBC correspondents or freelance science journalists rather than by eminent or practicing scientists.

8.5. *The changing voice of news*

The introduction of science correspondents helped change expectations within the BBC about who should deliver science on radio. By the mid-1960s, the blurring of news and comment that had begun a decade earlier (as detailed in section 8.1) was leading to a radical transformation of the style of news broadcasting. Indeed, Briggs describes the increased attention paid to news and current affairs as one of the biggest transformations to occur within the BBC during this period.⁸⁵ This, too, would impact on science programming.

In September 1967 BBC radio transitioned from Haley’s tri-part pyramid of Light Programme, Home Service, and Third Programme to a four-pronged arrangement of Radios One, Two, Three, and Four. Radio One would be a new service devoted to ‘pop’ music, Radio Two would take much that the Light Programme had broadcast before the changeover, Radio Three would largely carry programmes that would have fit comfortably on the Third Programme, and Radio Four would carry much that had previously been broadcast on the Home Service. Or, as the *Guardian* described them in numerical order, “pop, bop, fop and sop”.⁸⁶

In the days before the debut of Radios One, Two, Three, and Four, the *Daily Mail* drew attention to an ongoing struggle within the BBC. “There is a little civil war seething below the surface of radio”, wrote the *Mail* on 16 September 1967:

It is between the Mods and the Ancients, between those who see radio as the keeper of traditions that the BBC has basely surrendered, and those who believe radio can only

⁸³ Wilson, “Science Consultative Group - Science in News and Topical Programmes,” 1.

⁸⁴ Wilson, “Science Consultative Group - Science in News and Topical Programmes,” 1.

⁸⁵ Briggs, *Competition*, 5:61.

⁸⁶ *The Guardian*, October 2, 1967. Cited in Hendy, *Life on Air*, 31.

survive by competing in the modern world of communications and meeting it not only in speed but in style.⁸⁷

Though some of those who actually worked for the BBC during this period seem to have been unaware of the transition occurring around them, David Hendy – with the benefit of forty years of hindsight – confirms the *Mail*'s assessment. The BBC of September 1967, he writes, was “an institution in gradual thaw – one reaching tentatively toward a less dowdy, harder-edged style more in tune with the age.”⁸⁸ It is upon Hendy's account of this ‘gradual thaw’ that the bulk of this section draws.

One contributing factor, according to Hendy, was that the generation that had guided the BBC through the war and through the first two decades of the post-war period – the ‘Ancients’, as the *Mail* called them – was reaching retirement age.⁸⁹ The retirement of so many long-serving and well-established producers and senior managers left a vacuum at the BBC into which rushed a younger generation of personnel – the ‘Mods’ – which had come of age during the 1950s and the decline of deference.⁹⁰ Hendy writes that it was around this time that this younger generation began to make itself heard within the BBC. And, what is more, managers who had once dismissed the younger generation, began to listen.⁹¹ According to John Simpson – a 22-year old when he began working as a journalist at Broadcasting House in 1966 – by 1968 it was widely assumed that young people had “much better ideas than older ones.”⁹² “The times”, Simpson explained, with perhaps a nod to Dylan, “were changing”.⁹³

A second factor contributing to the ‘gradual institutional thaw’, was that producers and programme-developers at Broadcasting House were beginning to stress the need for the BBC to engage with the current social climate. As Hendy writes, “programme-makers were starting to absorb for themselves – and starting to recognize a need to reflect back to the audience – at least a flavour of a country in turmoil.”⁹⁴ In 1965, in fact, Hugh Greene, the Director-General,

⁸⁷ *Daily Mail*, September 16, 1967. Cited in Hendy, *Life on Air*, 37.

⁸⁸ Hendy, *Life on Air*, 33.

⁸⁹ Hendy, *Life on Air*, 32.

⁹⁰ Hendy, *Life on Air*, 32.

⁹¹ Hendy, *Life on Air*, 32.

⁹² John Simpson, *Strange Places, Questionable People* (London: Pan, 1999), 84–85. Cited in Hendy, *Life on Air*, 32.

⁹³ Simpson, *Strange Places, Questionable People*, 84–85. Cited in Hendy, *Life on Air*, 32.

⁹⁴ Hendy, *Life on Air*, 32.

informed an audience in Rome that in his opinion the role of the BBC was to “encourage the examination of views and opinion in an atmosphere of healthy scepticism.”⁹⁵ He continued:

I say ‘healthy scepticism’ because I have a very strong personal conviction that scepticism is a most healthy frame of mind in which to examine accepted attitudes and test views which, in many cases, have hitherto been accepted too easily or too long.⁹⁶

As Director-General, Greene therefore continued the trend towards news and current affairs begun during the 1950s and pushed to suffuse those programmes with that same healthy scepticism. Briggs argues that what distinguished this period from any other in the history of British broadcasting was that “the BBC itself as an institution – with Greene as its Director-General – considered it necessary to align itself with change and to spotlight its own preoccupation with it.”⁹⁷

A third factor was that management, producers, and programme-makers all began to recognize that radio would need to innovate in order to survive in its new circumstances – namely, its altered position within the media landscape due to the rising importance and popularity of television. According to Hendy, radio had become “a background medium, heard but not always listened to, taken for granted and unspectacular.”⁹⁸ To survive, radio would need to adapt.

This is not to say that the transformation of BBC radio came suddenly and without warning. As tempting as it might be to draw a sharp distinction between pre- and post-1967, the transformation of BBC radio – and in particular, speech radio – began well before, and extended well beyond, the 1967 transition. In fact, in a sub-section entitled ‘undercurrents of change’, Hendy notes that the changeover marked “not so much a revolution as the midway point in a gradual, but no less dramatic, reconstruction.”⁹⁹

One of the men who led this reconstruction was Gerard Mansell. Born and educated in Paris, Mansell had joined the BBC’s foreign news department in 1951, and had climbed his way up to head of features and talks for the Overseas Services before moving to Broadcasting House

⁹⁵ Anthony David Smith, ed., *British Broadcasting* (Newton Abbot: David and Charles, 1974), 182. Cited in Hollinshead, “The Production and Reception of Discourses Concerning Religion in Fictional Broadcasting,” 75.

⁹⁶ Smith, *British Broadcasting*, 182. Cited in Hollinshead, “The Production and Reception of Discourses Concerning Religion in Fictional Broadcasting,” 75.

⁹⁷ Briggs, *Competition*, 5:338–39.

⁹⁸ Hendy, *Life on Air*, 32–33.

⁹⁹ Hendy, *Life on Air*, 36.

in 1965 to take over as controller of the Home Service.¹⁰⁰ From the time he arrived, Mansell set about attempting to overhaul news and current affairs. In an interview years later Mansell explained that what he had wanted to do was replace “the slightly stiff, slightly buttoned up formats which existed up to that point” with the “raw stuff” of spontaneous talk.¹⁰¹

To accomplish this, Mansell hoped to overhaul radio news in two related ways. First, he wanted more ‘actuality’: more interviews with people who were actually involved in newsworthy events, more telephone reports filed by correspondents in the middle of those events, and more recordings of the actual sounds of those events.¹⁰² Second, he wanted to place those actuality inserts within a more spontaneous, casual, and free-flowing style of news programme. Both of these stylistic desires – for more actuality and less formality – were related to, and in some ways inseparable from, Mansell’s other major desire: to carve out even more territory for journalism within the BBC’s news services.¹⁰³ After all, as Hendy writes: matters of presentation are “never a neutral matter, never *just* about style.”¹⁰⁴ As mentioned in the beginning of this chapter, there had since the latter half of the 1950s been a growing desire to break down the barriers between news and current affairs; Mansell hoped to further dismantle this barrier during the latter half of the 1960s. In a memo to the Editor of News and Current Affairs on 30 August 1967, Mansell lamented:

We are still basically operating on the assumption that the proper way to present news is for an announcer to read it at the microphone in a totally impersonal manner, and that voice-casts and explanatory and background material should be kept separate from ‘straight’ news [...].¹⁰⁵

“We should seek to break down these barriers, which are largely artificial”, he argued, “and move towards an integrated ‘news show’ formula in which all these ingredients are fused”.¹⁰⁶ Doing so would continue the development of news and current affairs that had been growing since the

¹⁰⁰ “Gerard Mansell,” *The Telegraph*, December 27, 2010, sec. News, <http://www.telegraph.co.uk/news/obituaries/culture-obituaries/tv-radio-obituaries/8227237/Gerard-Mansell.html>.

¹⁰¹ Gerard Mansell, interview by David Hendy, June 2001. Cited in Hendy, *Life on Air*, 43.

¹⁰² Hendy, *Life on Air*, 44.

¹⁰³ Hendy, *Life on Air*, 45–46.

¹⁰⁴ Hendy, *Life on Air*, 45.

¹⁰⁵ Gerard Mansell, “News and Current Affairs,” August 30, 1967, R51/1078/1, Written Archives Centre. Cited in Hendy, *Life on Air*, 44.

¹⁰⁶ Mansell, “News and Current Affairs.” Cited in Hendy, *Life on Air*, 44.

end of the war, and would, Mansell hoped, make the Home Service *the* primary provider of news and current affairs programming.

Alongside these changes, interviews became less scripted and considerably less deferential. As Chignell explains, up to the 1950s the interviews of public figures and people in positions of power conducted by the BBC tended to be “deferential in the extreme”.¹⁰⁷ By the mid-1950s, however, this began to change. In Chignell’s words: “the British disease of deference and conformism was at last in remission.”¹⁰⁸ This contributed to the development of a more assertive and at times confrontational style of political coverage.¹⁰⁹ Not surprisingly, many in positions of power disliked the BBC’s new penchant for probing, unscripted interviews. Politicians, for instance, generally resented the loss of control occasioned by the BBC’s new interview style. Indeed, Briggs writes that the new form of interview that caught on in the mid-to late-1950s “did not always appeal to the people being interviewed, particularly Cabinet ministers who were used to more reverential treatment and to questions being given to them in advance.”¹¹⁰

The series that perhaps most embraced and reflected this changing approach to news, current affairs and journalism during the latter half of the 1960s, was the radio news series, *The World at One*. From its debut on 4 October 1965, this Home Service series set out to fuse news and comment more than any other programme that had come before, and in so doing boldly flouted nearly four decades of BBC tradition.¹¹¹ In his effort to break new ground, Mansell staffed the series not from the talks and current affairs side of the BBC, but with personnel drawn from *Radio Newsreel* – a series which took a far more fast-paced and adventurous approach to the news.¹¹² As Hendy writes: “Theirs was a different culture, less hidebound by questions of balance, correctness, and deference, and much more inclined to be controversial.”¹¹³ Theirs was also a culture that placed tremendous emphasis on being up-to-the-minute and took great joy in scrapping stories at the last minute to make way for breaking news.¹¹⁴

¹⁰⁷ Chignell, *Key Concepts*, 165.

¹⁰⁸ Chignell, *Public Issue Radio*, 57.

¹⁰⁹ Chignell, *Key Concepts*, 165, 173.

¹¹⁰ Briggs, *Competition*, 5:166.

¹¹¹ Chignell, *Public Issue Radio*, 85.

¹¹² Hendy, *Life on Air*, 48.

¹¹³ Hendy, *Life on Air*, 48.

¹¹⁴ Hendy, *Life on Air*, 49.

William Hardcastle, the man chosen to anchor *The World at One*, was an equally bold choice. A Fleet Street journalist and former editor of the *Daily Mail*, Hardcastle approached the programme as a trained journalist and fully embraced new methods of presentation such as radio actuality inserts, interviews, reports from correspondents on the ground, and phone interviews with witnesses to important events.¹¹⁵ According to Chignell, one of the most important innovations of *The World at One* was “the active involvement of the presenter in researching and writing for the programme.”¹¹⁶ Here, nearly a decade later, was the American-style presenter for which Burton Paulu had called in the 1950s.

Hardcastle did more than simply involve himself in the production of the programme, however; he developed a probing and at times confrontational and combative style of interview. As Mansell put it:

William Hardcastle broke all the accepted rules of broadcasting. He breathed heavily at the microphone, he stumbled over his script and addressed himself to the most powerful in the land with unaccustomed directness and no hint of deference.¹¹⁷

And as the series grew in popularity during the latter half of the 1960s – by 1965 it was attracting an audience of two million listeners¹¹⁸ – it gained a reputation for examining ‘harder’ news stories.¹¹⁹ Unlike radio news programmes during the 1950s and early 1960s which had tended to cycle endlessly through a calendar of national events and royal birthdays, Hardcastle and the *World at One* team turned their journalistic gaze upon striking workers, the Vietnam War and protests against it, and the campaigns to decriminalize homosexuality and legalize abortion.¹²⁰ In many ways, this push to engage with controversial topics fitted Hugh Greene’s 1965 call to examine accepted views and opinions with a dose of ‘healthy scepticism’.

The World at One was so successful and so popular that its combination of informality and hard-hitting journalism began to be copied by producers and programme-developers throughout the BBC. As Sue MacGregor, the presenter of the radio magazine *Woman’s Hour*, put it: “I think

¹¹⁵ Chignell, *Public Issue Radio*, 86.

¹¹⁶ Chignell, *Public Issue Radio*, 87.

¹¹⁷ Martha Kearney, “Martha Kearney: Celebrating 50 Years of World At One,” *Telegraph*, October 3, 2015, sec. Culture, <http://www.telegraph.co.uk/culture/tvandradio/bbc/11906531/Martha-Kearney-celebrating-50-years-of-World-At-One.html>.

¹¹⁸ *Financial Times*, December 6, 1965. Cited in Hendy, *Life on Air*, 49.

¹¹⁹ Chignell, *Public Issue Radio*, 86.

¹²⁰ Chignell, *Public Issue Radio*, 85–86.

many of us began to copy Bill [Hardcastle] – however unconsciously”.¹²¹ Indeed, by September 1967 *The World at One* had been spun off into a weekly Sunday programme entitled *The World This Weekend*. For Hendy, the widespread imitation and duplication of *The World at One* represented “more than an act of colonization for journalism *per se*. It also represented the growing preference within the BBC for a particular *kind* of journalism.”¹²² A harder-edged, more probing, less reverential, style of journalism.

Furthermore, the new emphasis on melding news and comment, had a profound effect on the role the BBC envisioned for itself within British society. Whereas the BBC’s news services had traditionally defined their role as informing the audience about what was happening, the BBC’s current affairs programmes defined their role as helping the audience understand what was happening.¹²³ As programmes like *The World at One* melded news and comment, they not only altered the approach engrained within the BBC, but altered the very purpose of news programmes. By providing such programmes the BBC was setting itself up as a service that could not only deliver the facts of the news, but the information and context behind the news; in short, the BBC could help you *understand* the news. As will be seen in the next chapter, this transformation would greatly impact how the BBC envisioned the purpose and value of science broadcasting.

¹²¹ Sue MacGregor, *Woman of Today: An Autobiography* (London: Headline, 2002), 120–48. Cited in Hendy, *Life on Air*, 49.

¹²² Hendy, *Life on Air*, 50. Original emphasis.

¹²³ Chignell, *Key Concepts*, 151.

Chapter 9:

Science Journalism and the Critical Turn

On 6 April 1967, *Science Review* dedicated its entire thirty-minute run-time to the Torrey Canyon, an oil tanker which had run aground on Pollard's Rock off the coast of Land's End 19 days earlier, spilling its contents into the Atlantic.¹ The BBC announcer for the broadcast noted that in its singular focus the programme would be “quite different from normal Science Reviews” and explained that the programme was an attempt to provide listeners with “the scientific information from behind the headlines”.² The programme turned out to be ‘quite different’ not only in its focus on a single topic, but in its style of presentation. Instead of a collection of individual, compartmentalized interviews, the thirty-minute programme took clips from unscripted interviews with half a dozen scientists and interwove them with recordings of BBC radio news releases about the spill, dramatized readings of government pronouncements on the matter, and personal commentary from the presenter. In style, it was akin to a feature article from a Fleet Street journalist.

The broadcast was also quite different than previous installments because for one of the few times since Alvar Lidell was dismissed as presenter in 1959, *Science Review* was presented by someone other than Archie Clow. The presenter of the Torrey Canyon broadcast, Michael ‘Mick’ Rhodes, had arrived in the Science Unit in the summer of 1964 after a short stint as an ecologist, and brought with him a very different approach to science programming on speech radio. Within the programme Rhodes probed and challenged his interviewees and served as an intermediary for the *Science Review* audience by providing background information, context, and explanations of complex scientific concepts.

When the Audience Research department tallied listeners’ reactions, the broadcast received a ‘Reaction Index’ of 71 – six points higher than the average for the previous 20

¹ Patrick Barkham, “Oil Spills: Legacy of the Torrey Canyon,” *The Guardian*, June 24, 2010, sec. Environment, <http://www.theguardian.com/environment/2010/jun/24/torrey-canyon-oil-spill-deepwater-bp>.

² Microfilm Script, *Science Review* (BBC Home Service Basic, April 6, 1967), 1, Radio Talks Scripts Pre-1970 (Film T463), Written Archives Centre.

reported broadcasts in *Science Review*.³ According to the report, the audience praised the “slightly unusual presentation” as “enlightening, clear and remarkably comprehensive”, and congratulated Rhodes on the “smooth, competent way he had conducted the programme.”⁴ As the report explained: “[Rhodes] was unobtrusive but remained firmly in charge, allowing no time to be wasted and no unnecessary talk.”⁵

In many ways, the April 1967 Torrey Canyon broadcast foreshadowed the shape of things to come, for by the start of the new broadcasting season that autumn, all three of Clow’s long-running series – *Science Survey*, *Who Knows?* and *Science Review* – had been canceled. The only regular science series on BBC radio was *New Worlds* (1967-1973), a new series proposed, developed, and produced by Rhodes which reflected its producer’s particular broadcasting ethos.

It is difficult to determine why Clow’s three programmes were all canceled. *Science Review* was canceled to make room for *New Worlds*, but the BBC’s written archives seem to contain no definitive statements regarding why management chose to end Clow’s other two long-running series. However, three influential factors likely contributed to the shakeup of science broadcasting at this time. First, the transition to a more probing, journalistic, and investigative style of news and current affairs programming detailed in the previous chapter. It was in the midst of this transition, in the summer of 1964, that Rhodes joined the BBC Science Unit. A second potentially influential factor was the transition to Radios One, Two, Three, and Four. Radios Two, Three and Four were not nearly as specialized as Radio One, for they continued to offer mixed programming and overlapped their content to a degree. As Seymour-Ure writes, it was only as the 1960s gave way to the 1970s that the BBC “accepted that the Reith/Haley commitment to ‘mixed’ programming on each station simply did not correspond to listening preferences.”⁶ Even so, as September 1967 approached there was much talk within the BBC that Radio Four would need to work hard to carve out a distinctive place for itself within the new quartet, and might even need to develop a few new speech radio programmes to help it do so. It was on Radio Four that *New Worlds* was eventually placed. And finally, a third potentially influential factor in the 1967 shakeup of science broadcasting, was that society was undergoing

³ Audience Research Department, “Audience Research Report: ‘Science Review’ - Thursday 6 April 1967,” June 12, 1967, 2, R9/6/181-184, Written Archives Centre. The Audience Research report for the November edition of *Science Review* explained: “The last twenty reported editions of *Science Review* have averaged 65”. Audience Research Department, “Audience Research Report: ‘Science Review’ - Thursday 3 November 1966,” November 1966, 1, R9/6/177-180, Written Archives Centre.

⁴ Audience Research Department, “Audience Research Report: 6 April 1967,” 2.

⁵ Audience Research Department, “Audience Research Report: 6 April 1967,” 2.

⁶ Colin Seymour-Ure, *The British Press and Broadcasting Since 1945*, 2nd ed (Oxford: Blackwell, 1996), 78.

dramatic changes of its own. As historian Arthur Marwick puts it, the 1960s were characterized by:

... black civil rights; youth culture and trend-setting by young people; idealism, protest and rebellion; [...] massive changes in personal relationships and sexual behavior; a general audacity and frankness in books and the media [...] the new feminism; gay liberation [...].⁷

One could also add environmentalism and the anti-nuclear and anti-Vietnam movements.⁸ What made the turmoil of the 1960s unique, according to Marwick, was the way in which rather than confronting society, these counter-culture movements “*permeated and transformed it*”.⁹

Mick Rhodes’ new science series *New Worlds* was a direct response to these changes within society and within the BBC. And though it was nominally intended as a replacement for *Science Review*, Rhodes’ series set out to be consciously different than Clow’s long-running series – or indeed any previous long-running science series on BBC radio; it would be more youthful, more conversational, and more ‘newsy’ while being less ponderous, less reverent and less scripted. More importantly within the context of this thesis, Rhodes intended to utilize correspondents and journalists to a greater degree than ever before. Rhodes explained the thinking behind the new series on 15 November 1966 in a memo to Clow. The memo shows a producer attempting to craft a science series that would reflect and engage with the changes both inside and outside Broadcasting House:

Finally, it seems to me that there is at the moment within the BBC a market for this sort of programme. There is almost certainly a market outside for the subject-matter – if we prepare it and present it in the right way.¹⁰

Chapter 8 detailed the ‘market within the BBC’ which Rhodes alludes to in the above quote; this chapter details the style of preparation and presentation Rhodes hoped to adopt and the subject matter he hoped to cover in order to exploit that market.

⁷ Arthur Marwick, *The Sixties: Cultural Revolution in Britain, France, Italy, and the United States, c.1958-c.1974* (London: Bloomsbury Reader, 2012), 3.

⁸ Jon Agar, “What Happened in the Sixties?,” *The British Journal for the History of Science* 41, no. 4 (December 2008): 578.

⁹ Marwick, *The Sixties*, 12.

¹⁰ Mick Rhodes to Archie Clow, “Weekly Science Magazine,” Memorandum, (November 15, 1966), 2, R51/1269/1, Written Archives Centre.

9.1. *Michael ‘Mick’ Rhodes and the New Guard*

As discussed in the previous chapter, in the BBC of the late 1960s there was, in the words of the *Daily Mail*, a war between the ‘Mods’ and ‘Ancients’. And though few people enjoy having a label thrust upon them, an argument can easily be made that Mick Rhodes would be a ‘Mod’ in the *Mail*’s schema for BBC personnel. Indeed, according to Michael Mason, a producer in the Talks department, *New Worlds* was Rhodes’ attempt to devise “new broadcasting formulae” that could survive on a rapidly changing radio service.¹¹ Importantly, Rhodes also embodies Hendy’s three-fold description of the ‘undercurrents of change’ which refashioned BBC news and current affairs during the mid- to late-1960s: Rhodes not only strove to create new broadcasting formulae, he actively sought to craft programmes that engaged with and reflected the temper of the times, and, having arrived at the BBC in the mid-1960s, was part of the new guard that began to refashion radio programming during the late 1960s. As such, he stands in contrast to his boss in the Science Unit, Archie Clow, a man who over the previous two decades had absorbed much of the traditional BBC culture.

Further, Rhodes in many ways can be seen as a reflection of what a number of scholars have identified as a shift away from positive and deferential coverage of science toward a more critical form of science journalism. Science journalists during this period began to cast upon science the same critical gaze which their colleagues working other beats routinely cast upon politics or culture. As Dorothy Nelkin has written about the American context:

The frame changed in the late 1960s and the 1970s when wonder gave way to concern about environmental and social risks. Journalists shifted their attention at this time from the conquests of science and technology to their consequences, from the celebration of progress to a more critical reflection about the problems brought about by technological change.¹²

According to Nelkin, this new breed of science journalist imbibed and responded to the “spirit of social criticism” that permeated this period and in doing so became increasingly sympathetic to concerns surrounding environmental controversies and questions about the social impact of science and technology.¹³ The science journalist Boyce Rensberger, writing in *Nature*, has

¹¹ Michael Mason to Mick Rhodes, “Weekly Science Magazine,” Memorandum, (November 17, 1966), 1, R51/1269/1, Written Archives Centre.

¹² Nelkin, *Selling Science*, 10.

¹³ Nelkin, *Selling Science*, 89.

characterized the shift as one from ‘cheerleader’ to ‘watchdog’.¹⁴ Nelkin, for her part, describes the new approach as “more interpretive, investigative, and adversarial in character”¹⁵ and notes that this new breed “tried to become critical investigators rather than passive conveyers of scientific and technical information.”¹⁶

The extent to which Rhodes reflects both the changing nature of the BBC and the changing nature of science journalism can be seen by examining the programmes he produced during his first years in the Science Unit. Before joining the unit in 1964, Rhodes worked (“rather unfruitfully”, by his own admission) as an ecologist performing population studies of bluebottles.¹⁷ After producing a number of stand-alone talks and a few broadcasts of *Who Knows?*, Rhodes began to make his mark in the summer of 1965 when *Who Knows?* and *Science Review* – which shared the 9:30 slot on Thursday evenings – each went on their traditional summer hiatus. (Regular, weekly programmes routinely went off the air during the summer months, leading to what one BBC radio critic called the “season of reminiscences, scrapbooks, and those old tapes they dig out of the recesses of the BBC’s back attics”.¹⁸ Rhodes hoped to subvert this trend.) In a July 1965 *Radio Times* article Rhodes explained that for the rest of the summer each Thursday evening slot would be taken over by what he called a series composed of “three basic types”.¹⁹ Each of these ‘basic types’ demonstrates a particular aspect of Rhodes’ approach to science programming and foreshadows the form, content, and tenor of *New Worlds* during the years immediately following the transition to Radios One, Two, Three, and Four.

The first group of programmes in Rhodes’ ‘summer of science’ was *Scientifically Speaking*, a four-part series which showcased Rhodes’ affinity for unscripted interviews conducted by trained journalists.²⁰ The series consisted of unscripted interviews with recent Nobel Prize winners and borrowed heavily from the format – and title – of *Frankly Speaking*, a long-running Home Service series which often billed itself as “unscripted interviews with well-known people”.²¹ Over the course of the 1950s and 1960s the ‘well-known people’ interviewed for *Frankly Speaking* ranged from actors and artists to architects and anthropologists – even activists – yet rather than one on one interviews, each programme featured two or three interviewers – in

¹⁴ Boyce Rensberger, “Science Journalism: Too Close for Comfort,” *Nature* 459, no. 7250 (June 25, 2009): 1055.

¹⁵ Nelkin, *Selling Science*, 89.

¹⁶ Nelkin, *Selling Science*, 89–90.

¹⁷ Mick Rhodes, “The Wood,” *The Listener* 85, no. 2200 (May 27, 1971): 668.

¹⁸ Mitchison, “The Spoken Word - Revived Regulars,” 584.

¹⁹ M.G. Rhodes, “Science in the Summer,” *The Radio Times*, no. 2173 (July 1, 1965): 47.

²⁰ The series ran intermittently from 1965 to 1968.

²¹ “Frankly Speaking,” *The Radio Times*, no. 1676 (December 23, 1955): 26.

many cases journalists and writers from outside the BBC – interviewing a single subject. From its debut in 1952, *Frankly Speaking* developed a reputation for probing, challenging, and often quite tense, interviews. One modern day journalist has gone so far as to describe the interviews as “closer to an interrogation than a cosy chat.”²²

Rhodes copied this formula for *Scientifically Speaking* and paired David Wilson with Wayland Young, a writer, politician, and former foreign correspondent for *The Observer*.²³ Within the unscripted and wide-ranging interviews, Wilson and Young became a much larger presence than Clow had been in his scripted interviews. Within *Scientists in Session* and *Science Review*, Clow would often ask no more than three or four single-sentence questions during a five to seven minute interview. The remainder of the interview was left to the contributing scientist. Within *Scientifically Speaking*, however, interviews took on the back and forth quality of a conversation, and Wilson and Young often laid out their own personal views on what the interviewee had said before proffering a follow up question. Thus whereas during the 1959 season of *Science Review* Clow on average spoke for just 10% of an interview, in the 28 September 1967 broadcast of *Scientifically Speaking* featuring physiologist Giles Brindley, the two interviewers²⁴ collectively spoke for 28% of the broadcast.²⁵

Not only did the unscripted interviews within *Scientifically Speaking* feature a greater presence from the two interviewers, but, crucially, both journalists were directed to retain the probing and challenging nature of *Frankly Speaking*. They were therefore tasked with much more than simply leading scientists from one point to the next. In a *Radio Times* article announcing the start of a second run of *Scientifically Speaking* Rhodes explained that the two interviewers had been instructed to “cross-question” the scientists taking part in the series and had therefore “done a lot of homework on each customer”.²⁶ With a nod to Ian Fleming, Rhodes added: “These two

²² Fiona Sturges, “Frankly Speaking, Review: Radio 4 Extra Unearths Landmark Interview Series,” *The Independent*, March 19, 2015, <http://www.independent.co.uk/arts-entertainment/tv/reviews/frankly-speaking-review-radio-4-extra-unearths-landmark-interview-series-10117936.html>.

²³ A second series broadcast in the autumn of 1967 featured Wilson with Mary Goldring of *The Economist*. A third series in the autumn of 1968 featured Wilson with frequent BBC broadcaster Elizabeth Gard.

²⁴ This broadcast of *Scientifically Speaking* featured Elizabeth Gard and David Wilson.

²⁵ Radio Broadcast, *Scientifically Speaking* (BBC Home Service Basic, September 28, 1967). To arrive at these figures I accessed the microfilm scripts stored at the WAC and tallied the total number of lines of dialogue attributed to the interviewer(s) compared to the total number of lines attributed to the interviewee. Clow spoke only slightly more than Alvar Lidell, the original presenter of *Science Review*. On average, Lidell spoke for 6.75% of his interviews in the autumn 1958 season of *Science Review*.

²⁶ Mick Rhodes, “Scientifically Speaking,” *The Radio Times*, no. 2282 (August 3, 1967): 41.

have been ‘licensed to kill’; if they feel the interviewee is prevaricating, we’ve asked them to tell him so.”²⁷

Perhaps not surprisingly, many scientists appear to have found the rise of the unscripted and probing interview as unappealing as politicians did (see Chapter 8.5). The pathologist Howard Florey quite early grew frustrated by the changing culture of broadcasting and in particular disliked the new trend of interviewing scientists. When, in 1961, Basil Sands, a producer for the BBC Overseas Service wrote to Florey to ask if he might agree to be interviewed, Florey’s response left little doubt about his opinion of interviews:

I must be quite frank with you I am afraid. I usually find such interviews as I can see on television and listen to on the British Broadcast Corporations’ wavelengths somewhat futile. I cannot now listen to them. I dislike very much the idea of being *cross-questioned* and put on tape in the way that is so commonly done in broadcast interviews.²⁸

His protestations appear to have worked to an extent, for when Gordon Rattray Taylor wrote Florey four years later about appearing in an interview for the new series, *Horizon*, Taylor was careful to explain to Florey that the interview would be more respectful than interviews that he had been asked to do in the past. “I am not thinking of the usual kind of news interview”, Taylor wrote, “but of a considered statement.”²⁹ Nonetheless, Florey once again demurred. In doing so, he clarified his reasons for distrusting the interview format. “It would be much better”, Florey wrote, “if I could have time to give some thought to the matters you raise rather than give ‘off the cuff’ answers which I might regret later.”³⁰

Florey’s remarks should not be taken as indicative of the entire world of science, however. Some scientists, in fact, appear to have appreciated the new approach to interviews. In November 1965, when Clow played for the SCG a recording of *Scientifically Speaking*, the scientists assembled enjoyed it. The minutes for the meeting record that the programme was “enthusiastically received and was generally agreed to have been a highly successful piece of

²⁷ Rhodes, “Scientifically Speaking,” 41.

²⁸ Howard Florey to Basil D. Sands, Letter, (January 3, 1961), HF/1/19/4/8, Royal Society Library and Archive. Emphasis added.

²⁹ G. Rattray Taylor to Howard Florey, Letter, (January 25, 1965), HF/1/19/6/5, Royal Society Library and Archive.

³⁰ Howard Florey to G. Rattray Taylor, Letter, (February 16, 1965), HF/1/19/6/5, Royal Society Library and Archive.

communication.”³¹ Clow agreed and informed the scientists in attendance that he hoped “to be able to put on more programmes of this character.”³² Over the next few years his hope came true as the BBC greatly expanded its usage of journalists and its delivery of probing interviews. As it did so, scientists lost even more control over the content and framing of science programming on radio.

The second group of programmes in Rhodes’ summer of science was a two-part series which Rhodes promised would “deal with openly controversial subjects”.³³ The first programme, ‘Animal Experiments’, examined the practice of vivisection in medical research, while the second, ‘Whales Against Man’, drew attention to current efforts to save whales from extinction.³⁴ Throughout his time in the Science Unit, Rhodes frequently produced programmes which engaged with openly controversial topics – 1965 brought an enquiry into the treatment of livestock (‘Factory Farms’)³⁵ and 1966 brought a programme on the desperate need for conservation (‘The Undercrowded Ark’)³⁶ – many of which took the form of investigations or ‘enquiries’ conducted by professional broadcasters or journalists. ‘Animal Experiments’, for instance, was presented by the well-known BBC interviewer and radio journalist, Leslie Smith. Smith interviewed scientists, delivered background information, and ultimately walked listeners through the arguments on each side of the issue – the role of the scientist being limited to that of an auricular ‘talking head’ who could supply information or opinion in order to aid Smith in his investigation. Not surprisingly, within these enquiries the journalists and broadcasters took up much more of the total air time for a programme. Whereas Clow had on average spoken for 10% of an interview within *Science Review* and the two interviewers in *Scientifically Speaking* had collectively spoken for 28% of their broadcast, within ‘Animal Experiments’ Leslie Smith spoke for over 50% of the broadcast.³⁷

Many of these investigations of controversial topics attempted to steer clear of casting judgement or making pronouncements about right or wrong. The goal was not necessarily to

³¹ “Science Consultative Group - Note of a Meeting Held on Friday, 19 November 1965,” Undated, 8, R6/289/1, Written Archives Centre.

³² “Science Consultative Group - Note of a Meeting Held on Friday, 19 November 1965,” 8.

³³ Rhodes, “Science in the Summer,” 47.

³⁴ Leslie Smith, “Animal Experiments,” Radio Broadcast (BBC Home Service Basic, July 29, 1965); “Whales Against Man,” Radio Broadcast (BBC Home Service Basic, August 12, 1965).

³⁵ “Factory Farms,” Radio Broadcast (BBC Home Service Basic, September 26, 1965).

³⁶ “The Undercrowded Ark,” Radio Broadcast (BBC Home Service Basic, July 28, 1966).

³⁷ Leslie Smith, “Scientific Experiments on Animals,” *The Listener*, no. 1902 (September 9, 1965): 371–72. As before, I arrived at this figure by accessing a script of this programme and tallying the total number of lines of dialogue attributed to Smith compared to the total number of lines attributed to his scientific interviewees.

reach a conclusion, but to open up the controversies to public scrutiny. The *Radio Times* advert for ‘Animal Experiments’, for instance, closed by noting that the programme was “an attempt to supply a basis of information on which each individual can make his own reasoned judgment on a subject riddled with illogicality and misconceptions.”³⁸ Even so, there were those who appeared to wish Rhodes would go further. After listening to ‘Whales Against Man’, J.D.S. Haworth, the BBC’s radio critic of the spoken word, praised the end of the programme for becoming “crusading in tone”, but lamented that it had not gone further.³⁹ “If this production had not been for Talks Science Unit”, he wrote, “it could have afforded to be more indignant than it was.”⁴⁰ If Haworth was right about there being limits to how ‘crusading’ a programme from the Science Unit could be, then it seems that even in a period when science journalists were increasingly engaging with controversial topics, the Science Unit ensured that its science programmes did not appear to cast blame or to vilify one side of an argument.

The final group of programmes in Rhodes’ summer of science was a three-part series entitled *Science in Action*, which showcased Rhodes’ affinity for programmes that examined modern applications of science and their impact on society. The series of “enquiries into applications of science”⁴¹ consisted of programmes on aircraft noise, automobile crashes, and water shortages – “three problems of immense importance”, according to Rhodes.⁴² In the 9 September 1965 edition of the *Radio Times* Rhodes explained why these three topics had been chosen and in doing so showed a willingness to problematize science, or at any rate the technological applications of science, that had not always existed on the BBC during previous decades. “The first two [problems] come directly from our technological advance,” he wrote: “from the devices of ‘science’ itself. The third follows from a mixture of climate and increased industrial use, though perhaps half of it comes from science.”⁴³

Given his background as an ecologist it is not surprising to find that Rhodes sympathized with the concerns and criticisms expressed by conservationists and environmentalists during the 1960s. The point of many of Rhodes’ programmes was not to simply blame science for the problems of the 1960s, however. In fact, many of Rhodes’ programmes that were critical of science nevertheless also looked to science and scientists for answers. Thus, in his *Radio Times*

³⁸ “Animal Experiments,” *The Radio Times*, no. 2176 (July 22, 1965): 52.

³⁹ J.D.S. Haworth, “The Spoken Word - Noises Off,” *The Listener*, no. 1899 (August 19, 1965): 284.

⁴⁰ Haworth, “The Spoken Word - Noises Off,” 284.

⁴¹ Rhodes, “Science in the Summer,” 47.

⁴² M.G. Rhodes, “Science in Action,” *The Radio Times*, no. 2183 (September 9, 1965): 43.

⁴³ Rhodes, “Science in Action,” 43.

article about *Science in Action* Rhodes followed his comment about the numerous modern problems caused by “the devices of ‘science’ itself” by arguing: “Maybe that *is* where the problems come from – but then, so may the answers.”⁴⁴ Thus, Rhodes did not necessarily hold an overtly hostile or negative view of science, but his programmes were certainly less deferential to scientists and did not espouse the view that science and technology were unquestionably positive forces within society. What is more, Rhodes was not alone in espousing such a view of science. Though Rhodes wrote the *Radio Times* advertisement for *Science in Action*, he appears to have had a good deal of help from the rest of the Science Unit. Indeed, David Edge produced the second of the three-part series, ‘Safer Cars’,⁴⁵ and that same year produced the seven-part series, *Some Scientific Americans* – a series of journalist-led interviews which, among other things, examined the “problem of waste” in the oceans,⁴⁶ and the “social and ethical implications of the ‘biological explosion’”.⁴⁷ The sixth broadcast, ‘Is Science Human?’ examined “some of the common fears that science may obliterate those concepts, skills, and values, that we treasure as being distinctively ‘human’.”⁴⁸ The summer of 1965, then, can be taken as indicative not just of Mick Rhodes’ approach to science programming, but of the changing approach to science programming within the Science Unit and within the BBC more generally.

9.2. ‘Biological Backlash’

If there is one project that fully encapsulates the approach to science programming that Rhodes developed during his first years in the Science Unit, it is the four-part series, *Biological Backlash*. Mounted in the spring of 1967 – six months before BBC radio transitioned to Radios One, Two, Three, and Four – the series examined what the *Radio Times* referred to as “the unexpected and often unpleasant surprises from technology’s impact on nature”.⁴⁹ To present the series, Rhodes drafted Gerald Leach, a science graduate, one-time presenter of the science series *It Can Happen Tomorrow* on Anglia Television, and former Science Editor for Penguin Books.⁵⁰ The collaboration evidently proved fruitful, for the two men would go on to collaborate

⁴⁴ Rhodes, “Science in Action,” 43.

⁴⁵ “Safer Cars,” Radio Broadcast, *Science in Action* (BBC Home Service Basic, September 23, 1965).

⁴⁶ “Some Scientific Americans,” *The Radio Times*, no. 2179 (August 12, 1965): 38.

⁴⁷ “Some Scientific Americans,” *The Radio Times*, no. 2201 (January 13, 1966): 18.

⁴⁸ “Some Scientific Americans,” *The Radio Times*, no. 2196 (December 9, 1965): 38.

⁴⁹ “Biological Backlash,” *The Radio Times*, no. 2262 (March 16, 1967): 50.

⁵⁰ Pearce Wright, “Obituary: Gerald Leach,” *The Guardian*, January 21, 2005, sec. Science, <http://www.theguardian.com/science/2005/jan/21/obituaries.pressandpublishing>.

on *New Worlds*, and in doing so would deploy many of the same methods they had developed while working on *Biological Backlash*.

The series was advertised as “four documentary programmes” and consisted of recorded clips from interviews with a dozen leading British biologists woven into a cohesive report by Leach who provided supplementary information, explanations, and commentary.⁵¹ Leach even summarized points that had come out during the interviews but which had not made for good sound bites. Each programme was, quite simply, an investigative report – the likes of which would not be out of place on a twenty-first century radio network.

In a *Radio Times* article announcing the series, Leach outlined what he and Rhodes were attempting to accomplish with the series and explained in depth the view of science and technology which underlay the programme. The article nicely demonstrates the more critical ethos that was beginning to take hold amongst science journalists and, to an extent, within the BBC at large. It is therefore reproduced here in (nearly) un-cut form:

Technologists are single-minded. They strive towards marvellous but limited goals, whether it is a better pesticide or a faster airliner. This narrow, directed approach brings us enormous benefits. It also brings trouble. For everything technologists do (and that's a great deal) invariably has an impact on the huge, complex, delicate, easily understood natural world of land, water, air, animals, and – not least – man. This natural world, ourselves included, is often hurt by these impacts, sometimes gravely and irredeemably. So the technological benefit is grossly de-valued: the natural world lashes back at us. Can we do better? [...] Can we progress biologically, working with and in the environment rather than – as so often – against it? These are crucial questions if we are to have any kind of dignified future – and only biologists can answer them. I put them, with many other questions, to a dozen or so of the most distinguished biologists in this country. From resulting conversations we compiled the four weekly programmes [...]. Do not expect to hear final answers. Do expect to hear the voices of a new, growing, impatient, and challenging force in the difficult but absorbing business of designing our future.⁵²

Though no scripts of the four-part series appear to have survived in the BBC's archives, the audience research reports for the series show that Leach suffused his interviews with his (and Rhodes') less deferential approach to scientists and technologists. According to the report for the first broadcast ('Impact on Environment'), during an interview with the conservationist

⁵¹ “Biological Backlash,” 50.

⁵² Gerald Leach, “Biological Backlash,” *The Radio Times*, no. 2260 (March 2, 1967): 34.

Palmer Newbould, Leach apparently could not conceal his dismay at the casual manner in which Newbould dismissed the problem of polluted water.⁵³ What is more, a section of the listening audience shared Leach's dismay. The report explained that a group of listeners felt that "some of the scientists sounded too complacent about the conditions they were describing".⁵⁴ "[H]ow easy it is for experts to convince themselves 'we've learnt that lesson now'", observed one listener.⁵⁵ Overall, the response from the listening audience was glowing, with the same report noting that the programme had been "warmly welcomed by the large majority of the reporting audience for the light it shed upon one of the most pressing issues to come into prominence in recent years."⁵⁶

Interestingly, listeners not only reported their appreciation of the subject matter, but also reported their appreciation of the more journalistic, 'documentary' style of reporting and the way in which Leach had summarized important points. Thus, the audience research report for the second broadcast ('Impact on Man') explained:

... while a few [respondents] objected to the editing, in which a good deal of what had been said by the experts was summarised by Gerald Leach, the majority expressed themselves pleased with both the material and its presentation. Mr. Leach not only asked some challenging questions, it seemed, but provided an excellent linking commentary which welded the various parts of the programme into a coherent and meaningful whole [...].⁵⁷

By summarizing 'what had been said by the experts', Leach was quite literally taking over the communication of science from scientists. Not only had the scientists who took part in the programme been interviewed rather than being asked to deliver a scripted talk – as they might have been asked to do in previous decades – but much of what they had said during the interview was later edited, recontextualized and even reworded by Leach in order to 'weld' the various interviews into a 'coherent and meaningful whole'. As Agar has written about journalism in the long 1960s: "journalists could ventriloquize, even replace, expert voices. In this way,

⁵³ Audience Research Department, "Audience Research Report: 'Biological Backlash - Impact on Environment' - Tuesday, 7 March 1967," March 30, 1967, 2, R9/6/181-184, Written Archives Centre.

⁵⁴ Audience Research Department, "Audience Research Report: 7 March 1967," 2.

⁵⁵ Audience Research Department, "Audience Research Report: 7 March 1967," 2. Original emphasis.

⁵⁶ Audience Research Department, "Audience Research Report: 7 March 1967," 1.

⁵⁷ Audience Research Department, "Audience Research Report: 'Biological Backlash - Impact on Man' - Wednesday, 15 March 1967," April 11, 1967, 1, R9/6/181-184, Written Archives Centre.

journalists would not merely represent experts but anticipate and reconstruct what an expert might say.”⁵⁸

Rhodes himself was singled out for the way he was able to construct a four episode narrative from a dozen interviews, with a BBC critic writing: “The production by Mick Rhodes had a neat appreciation of essentials, drawing together the various threads of fact and speculation to a final vision of hope”.⁵⁹ From the perspective of the audience, the way in which Rhodes and Leach approached the production and delivery of science content may have been a welcome innovation, but, as will be seen in Chapter 10, from the perspective of many scientists, it seemed that the BBC and the science journalists it employed were usurping scientists’ rightful role as communicators of science. It also opened the BBC up to criticism from scientists who assumed – some rightfully, some less than rightfully – that they themselves could have done it better.

9.3. ‘a really lively, popular programme of science news and comment’

By the time Rhodes celebrated his third anniversary in the Science Unit in the summer of 1967, he had developed a particular approach to science programming. The majority of his most high profile programmes were defined by: a reliance on interviews rather than straight talks; a preference for enquiries or documentaries conducted by professional broadcasters or trained journalists; an affinity for controversial subjects; a willingness to examine the impact of science and technology on society, especially the impact of technology on the environment; and a penchant for adopting a more investigative, interpretive, and at times critical, approach to the communication of science. Thus, when *New Worlds* debuted on 20 October 1967, it did not represent the arrival of something wholly new on BBC radio; rather it represented the continuation and outgrowth of much that Rhodes and his colleagues had been doing since the mid-1960s. With the cancellation of Clow’s *Science Survey*, *Science Review*, and *Who Knows?*, however, *New Worlds* was poised to become *the* major science series on BBC radio. Indeed, from its debut in October 1967, *New Worlds* was the most visible and arguably most important science series on BBC radio. As such, during the last years of the 1960s it in many ways represented BBC science radio to the outside world in the same way that Clow and *Science Survey* had represented BBC science radio during the first decades of the post-war period. Because of this,

⁵⁸ Agar, “What Happened in the Sixties?” 576.

⁵⁹ Peter Thorogood, “The Spoken Word - Take a Pill, Take Two Pills,” *The Listener*, no. 1985 (April 13, 1967): 507.

the series, and the assumptions which underlay its particular approach to science programming, deserve to be examined in close detail.

It is important to note that despite being the one who initially proposed the series, spearheaded its development, and served as its first producer, Rhodes was not the only producer who contributed to the planning and production of *New Worlds*. Nearly a dozen producers, correspondents and broadcasters within the BBC collaborated with Rhodes on the development of the series, including Archie Clow and David Paterson, Rhodes' colleagues in the Science Unit. Thus, after submitting an initial outline for the series to Clow on 15 November 1966, Rhodes distributed copies of his proposal to his colleagues asking for initial reactions that would help "modify it".⁶⁰ A second outline followed a few weeks later which Rhodes noted derived "from a discussion" between eight producers and programme-developers and which expanded upon the initial proposal.⁶¹ The collaborative nature of the series is further demonstrated by the fact that from its debut *New Worlds* was listed in the *Radio Times* as "a Science Unit Production" rather than as the product of an individual producer – making it one of the first series to be listed in this way.⁶² In light of this, the particular approach of *New Worlds* should not be taken as the approach of a single producer, but of a wider movement within the BBC. As will be seen, a number of personnel within the BBC shared Rhodes' approach to science programming and were quite enthusiastic about Rhodes' plans for the new series.

From his very first memo, Rhodes was clear that he sought to replace *Science Review* with a weekly, thirty-minute, "in-one-place science news service"⁶³ unlike anything that had existed on BBC radio up to that point. Though *Science Review* had in fact become much more of a news service during the mid-1960s – it was once described as lying "between news reporting and the fuller treatment of Science Survey"⁶⁴ – Rhodes and his colleagues hoped to press this further. A short article in the June 1970 edition of the *Radio Times* highlighted the up-to-the-minute ethos of the series:

'When is it going to be broadcast?' asks the expert on fleas as he leaves the New Worlds studio. But the expert, be he astronomer or engineer, forensic scientist

⁶⁰ Mick Rhodes to H.T.C.A.(S), "Weekly Science Magazine," Memorandum, (November 15, 1966), R51/1269/1, Written Archives Centre.

⁶¹ Mick Rhodes, "Revised Brief for a Weekly Science Magazine," Memorandum, (January 4, 1967), 1, R51/1269/1, Written Archives Centre.

⁶² "New Worlds," *The Radio Times*, no. 2292 (October 12, 1967): 78.

⁶³ Rhodes to Clow, "Weekly Science Magazine," 2.

⁶⁴ "Science Broadcasting - Notes by the BBC on Programme Organisation and Current Output," 3.

or surgeon, test-pilot or psychologist, is never told. Tomorrow can so easily bring even more startling science news – that’s why there are no programme details [in the *Radio Times*]. You’ll just have to listen – and you’ll be surprised.⁶⁵

This prioritizing of up-to-the-minute news mirrored the developments in news and current affairs brought about by Mansell. And, like Mansell and those involved in the refashioning of news and current affairs during the latter half of the 1960s, Rhodes hoped to craft a more modern news series that would not only be up-to-date, but would fuse news and comment. The intention was to create a news magazine that could report on important or pressing topics involving science through a combination of interviews, discussions, actuality recordings, reports from scientists, investigative reports from science journalists, and commentaries and explanations from BBC personnel.

Rhodes also signaled that he and his colleagues intended to aim the series at a different audience than the one at which *Science Review* had been aimed. Although Rhodes hoped to carry over the existing *Science Review* audience – which was, he suspected, a “small but largely committed” group “probably with some professional scientific interest already” – the “main concern of the programme” was to be the “the casual listener, who tunes in again because he found it interesting the first time.”⁶⁶ In his second outline Rhodes described the intended “non-technical” audience as “mums to factory managers”.⁶⁷

At a meeting of the SCG in June 1967, George Camacho, Head of Talks and Current Affairs (Radio), explained the reasoning behind this attempt to reach a different audience. According to the minutes of the meeting, Camacho acknowledged that “the current run of science/technology programmes on radio was listened to mainly by people of above-average intelligence who were interested in the subject” – e.g., *Science Survey* and *Science Review* – but explained that he and his colleagues believed “that Radio should try to reach beyond this minority audience to the many whose interest might be awakened by a more popular approach.”⁶⁸ In a comment that shows the extent to which Rhodes and his colleagues were explicitly modeling their new series on the ascendant news and current affairs programming,

⁶⁵ “New Worlds,” *The Radio Times*, no. 2431 (June 11, 1970): 51.

⁶⁶ Rhodes to Clow, “Weekly Science Magazine,” 1.

⁶⁷ Rhodes, “Revised Brief for a Weekly Science Magazine,” 1.

⁶⁸ “Science Consultative Group - Note of a Meeting Held on Thursday, 8 June 1967,” October 19, 1967, 5, R78/76/1, Written Archives Centre.

Camacho explained that he and his colleagues “wanted to do for Science and technology what programmes like ‘Today’ and ‘Ten O’Clock’ had done for current affairs.”⁶⁹

In Rhodes’ second memo he explained that since the series was to be placed in a newly-created early evening slot, the challenge was not “how and what audience to attract”, but “how to keep the audience passed on by ‘The Archers’ and their like” and then how to keep that audience “hooked from week to week”.⁷⁰ The best way to hook such an audience, Rhodes decided, was to ensure that the style of the series was as arresting as possible. In deciding as much, Rhodes was once again behaving like a ‘Mod’. More importantly, he was mirroring Mansell’s attempts to steer the BBC’s news services away from the ‘slightly buttoned up’ programmes of previous decades toward programmes that were spontaneous, raw, flowing, and conversational. In fact, much of Rhodes’ writing during this time dealt in comparisons and dichotomies – between past traditions and new approaches. With a nod to his ‘modish’ roots Rhodes explained that the presentation of the new series “would have to be fast-moving and far less reverent than we’re accustomed to. If it is a choice between gimmick and platitude, then it would take the gimmick every time.”⁷¹ Rhodes was well aware that this might alienate older generations that had grown up with radio and that were accustomed to a more reserved style of science programming, but he was adamant that in order to survive in radio’s changed circumstances and in the current social climate, the series would need to carve out new terrain. The format and presentation of the series “would have to be youthful”, he stressed, “and perhaps even a touch too enthusiastic for most tastes.”⁷²

As it turned out, Gerard Mansell was fully supportive of Rhodes’ plans for the innovative science news series. “I’ve read your proposal for a new weekly Science Magazine [...] with very great interest and am in particularly close agreement with what you say about style and target audience”, Mansell wrote to Rhodes: “I am very much in favour of what you propose and hope we can get a really lively, popular programme of science news and comment off the ground fairly rapidly.”⁷³ It appears Rhodes was quite right when he wrote that there was “at the moment within the BBC a market for this sort of programme.”⁷⁴

⁶⁹ “Science Consultative Group - Note of a Meeting Held on Thursday, 8 June 1967,” 5.

⁷⁰ Rhodes, “Revised Brief for a Weekly Science Magazine,” 1. Original emphasis.

⁷¹ Rhodes to Clow, “Weekly Science Magazine,” 1.

⁷² Rhodes, “Revised Brief for a Weekly Science Magazine,” 2.

⁷³ G.E.H. Mansell to Mick Rhodes, “Weekly Science Magazine,” Memorandum, (November 17, 1966), R51/1269/1, Written Archives Centre.

⁷⁴ Rhodes to Clow, “Weekly Science Magazine,” 2.

9.4. ‘a rapidly advancing technological society with quickly altering norms’

One of the demands Rhodes and his colleagues had for the new series was that it should not focus on news from within the world of science, but rather on stories about science and its impact on the world. In his first outline Rhodes had dictated that the content of the new series would have to be “as connected to the audience as possible” and would have to “keep answering the question ‘What’s this got to do with me?’”⁷⁵ In response to Rhodes’ initial outline, David Wilson argued that the series should go further and “aim at a broader concept of illustrating the area where science and society meet and interact”.⁷⁶ After consultation with his colleagues Rhodes summarized his colleagues’ thinking by writing that in addition to being “good radio” – which meant including “as many grunts, explosions, and sound effects as possible” – any item included in the new series would have to be “an ‘us’ item and not a ‘them’ item.”⁷⁷ “‘Us’ items [...] concern all of us”, he explained:

... ‘them’ items concern ‘the scientists’, ‘the politicians’, ‘the policy-makers’; anybody but us mums and factory managers. Doctors’ pay could be made into an ‘us’ item in that if they don’t get paid they won’t doctor us; a row between the Ministry of Technology and the Food Industries Research Association is a ‘them’ story.⁷⁸

A recent scientific discovery, impressive engineering accomplishment, or upcoming scientific conference would only be a valid addition to the series if it impacted on the public in some way. Thus whereas reports on important developments *within* science often found space in *Science Review* and *Science Survey*, such reports would not be welcome within the new series. David Paterson, writing in the *Radio Times* in April 1968, summarized the Science Unit’s initial approach to the series and the lessons it had learned since the series launched six months prior. “We are convinced”, he wrote, “that listeners really want to hear about the science that affects them – not about science for science’s sake.”⁷⁹ The only exceptions were what Rhodes called “miraculous

⁷⁵ Rhodes to Clow, “Weekly Science Magazine,” 1.

⁷⁶ David Wilson to Mick Rhodes, “Weekly Science Magazine,” Memorandum, (November 30, 1966), R51/1269/1, Written Archives Centre.

⁷⁷ Rhodes, “Revised Brief for a Weekly Science Magazine,” 1.

⁷⁸ Rhodes, “Revised Brief for a Weekly Science Magazine,” 1.

⁷⁹ David Paterson, “New Worlds,” *The Radio Times*, no. 2320 (April 25, 1968): 57.

‘gee-whizz’ items – miraculous probably because the scale is so great: space and the moon for example.”⁸⁰

At the same time that Rhodes and his colleagues were restricting the type of news that could be included in the series, they were expanding the definition of science. During the planning stages, the Talks department’s Michael Mason wrote a letter to Rhodes in which he argued that the “science spectrum could be stretched broadly” to allow the series to investigate, among other things, “the things which social anthropologists are going to have to say about technology”.⁸¹ In his own letter, David Wilson agreed with Mason and felt the series should be free to “cast its net widely over the social sciences and philosophy of science”.⁸² Rhodes agreed and, for good measure, added that it should also be free to delve into “economics where it impinges on science”⁸³ and possibly even touch on interesting but less well-known research like the scientific and statistical analysis of poetry and prose.⁸⁴

The memoranda that passed back and forth between Rhodes and his colleagues show that the desire to focus on science that was impacting society was in many ways a reflection of the then widespread preference within the BBC for programmes that reflected and engaged with the temper of the times. Mason, for instance, felt the series should focus on “the world we are moving into” – which, he explained, he had long felt “should of its very nature essentially be a science broadcasting operation.”⁸⁵ Such an approach, he argued, would help the new series survive in the new media landscape where television was quickly replacing radio as the most important medium of mass communication in the country. It would land the series “just about midway between the gimmicky emphasis in television and the radio worthiness, which is admirable but not sufficiently competitive in our present changed circumstances.”⁸⁶ In the end, Rhodes appears to have adopted much of this approach, for in his second outline he explained that the “best stories” would “emphasize change, and ‘what’s round the corner that’s going to develop from this?’”⁸⁷ The series would, he concluded, “reflect a rapidly advancing technological society with quickly altering norms.”⁸⁸ This willingness – indeed desire – to engage with a rapidly

⁸⁰ Rhodes, “Revised Brief for a Weekly Science Magazine,” 1.

⁸¹ Mason to Rhodes, “Weekly Science Magazine,” 2.

⁸² Wilson to Rhodes, “Weekly Science Magazine.”

⁸³ Rhodes, “Revised Brief for a Weekly Science Magazine,” 2.

⁸⁴ Rhodes, “Revised Brief for a Weekly Science Magazine,” 2.

⁸⁵ Mason to Rhodes, “Weekly Science Magazine,” 2.

⁸⁶ Mason to Rhodes, “Weekly Science Magazine,” 1.

⁸⁷ Rhodes, “Revised Brief for a Weekly Science Magazine,” 2.

⁸⁸ Rhodes, “Revised Brief for a Weekly Science Magazine,” 2.

changing society and to examine not only the changing structure of society but altering societal norms, fitted the current milieu within the BBC.

Rhodes was also clear that he sought to carve out space for a more probing, investigative style of journalism akin to the style that dominated Fleet Street and was increasingly dominating the BBC's news services. "For example", he wrote in the first memo, the series could aim to deliver "the sort of thing that the Sunday Times Insight people would do immediately on impure nitrous oxide."⁸⁹ The Insight team was – and still is – a well-known team of investigative journalists who in the autumn of 1966 had detailed the cases of two women exposed to a batch of impure nitrous oxide while undergoing what should have been fairly routine surgical procedures.⁹⁰ In his second memo in January 1967 Rhodes returned to the topic of probing, investigative journalism and noted that an exposé on "prison security and the psychology of punishment might have been good" had the series then been up and running.⁹¹ His reference is difficult to pinpoint, but likely refers to a review of prison security conducted by Lord Mountbatten, the report for which was published in December 1966. Among other things, Mountbatten reported that the recent policy of handing out longer, potentially life-long, prison sentences, had fundamentally altered the philosophy behind prison administration and treatment.⁹² This change in policy raised important questions related to the treatment of prisoners, including whether to allow contact with family and loved ones.⁹³ The controversy continued to develop over the first few months of 1967, and in February the *Times* interviewed the wife of a prisoner who warned: "He is looking terribly ill and very thin and drawn. He has lost a lot of weight. If they go on treating him like they are now he will not come out sane."⁹⁴ These two stories were the type of hard-hitting journalism for which Rhodes hoped carve out space in *New Worlds*.

In light of the fact that the series needed to try to capture a broad cross-section of the listening public during an evening time-slot, however, the series would not consist entirely of hard-hitting journalism. Of the "five to ten, short items" that would generally make up each

⁸⁹ Rhodes to Clow, "Weekly Science Magazine," 2.

⁹⁰ Bryan Silcock and Cal McCrystal, "Suspect Gas: 148 Cylinders," *The Sunday Times*, September 11, 1966, 1.

⁹¹ Rhodes, "Revised Brief for a Weekly Science Magazine," 2.

⁹² Deborah Drake, *Prisons, Punishment and the Pursuit of Security*, Critical Criminological Perspectives (Houndmills, Basingstoke, Hampshire ; New York, NY: Palgrave Macmillan, 2012), 40–41.

⁹³ Alison Liebling, "High Security Prisons in England and Wales: Principles and Practice," in *Handbook on Prisons*, ed. Yvonne Jewkes, Ben Crewe, and Jamie Bennett, 2nd ed (London & New York: Routledge, 2016), 479.

⁹⁴ Our Home Department Correspondent, "Wives Condemn Gaol Security Wing," *The Times*, February 16, 1967, 2, The Times Digital Archive.

programme, Rhodes explained in his second memo, “the first items should be the hooking items” while “the later ones might be harder.”⁹⁵ The need to balance both harder and lighter stories, was one reason for the adoption of the magazine format. Indeed, according to Chignell the radio magazine became increasingly popular in the late 1960s and early 1970s in part because it proved a convenient way to “deal with both light and entertaining items as well as much more serious material.”⁹⁶

Rhodes closed his second memo by noting that throughout all of these investigative reports, and particularly within the interviews, he hoped to emulate the “cutting William Hardcastle postscripts” for which *The World at One* had become famous. If Hardcastle could address himself to “the most powerful in the land” with “unaccustomed directness and no hint of deference”, as Mansell had put it, then perhaps *New Worlds* could, too.⁹⁷ Sue MacGregor, as it turns out, was quite right: many within the BBC did indeed emulate Hardcastle and *The World at One* during the latter half of the 1960s. What is more, Rhodes and his colleagues did so consciously and explicitly.

As a result of this increased emphasis on probing, investigative journalism, *New Worlds* was set to be quite different from the previous science series produced by the Talks department or the Science Unit. In a comment with far-reaching implications, Rhodes wrote: “Clearly the programme would use scientific journalists much more than we have in the past.”⁹⁸ Rhodes hoped to commission pieces by outside science journalists – here he once again offered the example of a report on the devastating effects of impure nitrous oxide – and noted that these pieces might turn out to be “small features.”⁹⁹ He even hoped to carry reports from science journalists from the United States and Australia. In seeking to so heavily rely on science journalists, Rhodes was directly challenging Talks department policy as it had existed since the end of the war, and was signalling his willingness – indeed determination – to move beyond the remit to exclusively use scientists themselves in the delivery of science programmes. It was less than three years, after all, since, as noted in the previous chapter, the BBC had re-affirmed to the SCG its commitment to using scientists rather than science journalists in the communication of science. Back then the BBC had informed the SCG that “the policy of the BBC [...] on the whole” was to “use the working scientist, accepting the risk of failure, rather than the science

⁹⁵ Rhodes, “Revised Brief for a Weekly Science Magazine,” 2.

⁹⁶ Chignell, *Key Concepts*, 32.

⁹⁷ Kearney, “Martha Kearney.”

⁹⁸ Rhodes to Clow, “Weekly Science Magazine,” 2.

⁹⁹ Rhodes to Clow, “Weekly Science Magazine,” 2.

writer or journalist with secondhand knowledge who may be more accomplished at ‘putting it across’.”¹⁰⁰ *New Worlds* signaled a clear and forceful shift away from this policy; it represented a growing belief that in certain cases the best people to deliver science programmes were not necessarily ‘scientists themselves’. As such, it seemed to represent the acceptance of much that Clow had campaigned for over the previous two decades. However, as will be seen in Chapter 10, in important ways *New Worlds* actually represented the rejection of much of Clow’s approach.

Rhodes’ shift toward professional journalists and broadcasters influenced the choice of presenter as well, for each of the presenters of *New Worlds* was an experienced journalist or broadcaster. As mentioned above, Gerald Leach, the first presenter of *New Worlds*, had served as the presenter of *It Can Happen Tomorrow* on Anglia Television and as Science Editor for Penguin Books. In addition to this he had co-produced *Eye on Research* on BBC television.¹⁰¹ All told, over its five and a half year run, *New Worlds* was fronted by half a dozen presenters, all of whom were professional journalists or broadcasters with a background in science, including: Peter Fairley, long-time science correspondent of the *London Evening Standard*; Paul Vaughan, medical journalist, frequent contributor to BBC World Service programmes on science and industry, and voice of *Horizon* on BBC television from 1968 to 1995; Patrick Moore, self-taught astronomer and long-time presenter of *The Sky at Night* on BBC television; and James Burke, presenter of *Tomorrow’s World* from 1965 to 1971.

With Leach at the helm and a roster of science journalists ready to contribute to the new series, Rhodes was able to introduce to *New Worlds* the same probing, investigative and interpretive form of science journalism that had defined programmes like *Biological Backlash*.

9.5. ‘new styles of presentation’

From its debut in October 1967, *New Worlds* accomplished much that it set out to do. By March 1969 the Audience Research department could report that the series was “Generally considered to be an excellent programme ‘keeping one in touch with modern developments over a wide field’”.¹⁰² Perhaps more importantly for Rhodes and the rest of the Science Unit, listeners seemed to appreciate the style of presentation, with one listener commenting: “It’s good to know

¹⁰⁰ “Science Consultative Group - Broadcasting about Science and Technology,” 1.

¹⁰¹ Wright, “Obituary.”

¹⁰² Audience Research Department, “Audience Research Report: ‘New Worlds’ - Friday, 21 March 1969,” April 16, 1969, R9/6/205-208, Written Archives Centre.

how much is really going on in the world of science and how much of it is perfectly accessible to the layman *if suitably presented*.”¹⁰³

Part of the ‘suitability’ of the presentation of *New Worlds* appears to have been due to the way the scientists within the programme were treated, introduced, managed, utilized, deployed. The modern methods of communication which *New Worlds* used not only made for a more fast-paced, lively style, but many of those methods – interviews, discussions, enquiries conducted by journalists, solo reports by journalists – tended to place scientists in a secondary, contributory role that was quite different from the role they had enjoyed in the early days of post-war radio. Aside from a few isolated instances where scientists were asked to deliver straight talks to the *New Worlds* audience, the vast majority of items within the series were delivered by the series chairman or by journalists from either inside or outside the BBC. The first ten broadcasts of the series featured: 37 interviews; 12 investigative reports complete with commentary, explanations and edited sound-bites; 11 reports from journalists where the only voice was that of the journalist; and only four straight talks from scientists. The number of straight talks was actually relatively high considering the next 24 broadcasts in the series featured only one such talk from a scientist.

Due to the reliance on interviews and investigative reports, there was nearly always someone inhabiting the mediatory role that had begun developing over the previous decade and which Clow himself had inhabited during his years as the chairman of *Science Review*. Yet unlike Clow’s interviews which, as discussed in Chapter 7, were largely scripted and geared toward helping to lead the scientist along, the interviews conducted by the various chairmen and professional journalists who worked on *New Worlds* were unscripted and were aimed at drawing out information deemed to be important for the audience. The distinction is a subtle but important one. Whereas within his interviews Clow had largely seen himself as engaged in a joint venture with scientists, *New Worlds* placed itself firmly on the side of the audience. The goal was no longer drawing out authoritative comment from scientists or helping scientists communicate the information they wanted to communicate, but about drawing out information that Leach and the contributing journalists felt was important for the audience to know. If Clow can be described as an advocate for scientists, then Leach and his compatriots were advocates for the *audience*.

¹⁰³ Audience Research Department, “Audience Research Report: 21 March 1969.” Emphasis added.

In addition, since *New Worlds* was designed to focus exclusively on ‘us’ items of social, economic, or political importance – ‘gee-whizz’ items notwithstanding – the journalists working within *New Worlds* tended to ask different questions of scientists. Whereas Clow had often asked scientists appearing on *Science Review* to explain *how* a particular technological development worked – e.g. how a computer worked or how a new material was produced – the journalists working for *New Worlds* primarily asked scientists *why* that new computer or material was important. Thus, as a rule, scientists were not only asked to avoid using scientific jargon – as they had been asked to do when appearing on *Science Review* – but to also keep their responses succinct and to avoid delving into too much detail about the inner workings of a new mechanical process or piece of technology. According to the audience research report for the 27 October 1967 broadcast of *New Worlds*, over half of the sample audience “welcomed the absence of technical detail” and were “quite satisfied to be told of new ideas and possibilities for the future without being particularly anxious to hear all the ‘ins and out’.”¹⁰⁴ All told, judging by the BBC’s audience research for the series, the different way of utilizing scientists kept the programme engaging for listeners who might not have tuned in to other science programmes. The same audience research report later noted that “quite a few” respondents were glad that none of the scientists who spoke on the programme were “allowed to become ‘long-winded’ or ‘boring’.”¹⁰⁵

At the May 1968 meeting of the SCG, George Camacho could report that with the debut of *New Worlds*, “New styles of presentation” had successfully been introduced to the BBC’s domestic services.¹⁰⁶ The new series, he explained to the scientists in the group, made “good use of scientific journalists and had proved its ability to produce good on-the-spot reporting”.¹⁰⁷ In addition, Camacho could report that Wilson and his colleagues in News Division had also made “considerable” contributions to the new Talks department series.¹⁰⁸ With the cancellation of *Science Survey*, *Science Review* and *Who Knows?*, the only regular, weekly science series on BBC radio was structured around interviews and investigative reports by science journalists rather than straight talks by scientists.

The minutes of the SCG do not record whether the scientists in the group approved of the new style of presentation, but at least one science communicator who frequently worked

¹⁰⁴ Audience Research Department, “Audience Research Report: ‘New Worlds’ - Friday, 27 October 1967,” December 5, 1967, 1, R9/6/189-192, Written Archives Centre.

¹⁰⁵ Audience Research Department, “Audience Research Report: 27 October 1967,” 1.

¹⁰⁶ “Science Consultative Group - Note of a Meeting Held on Friday, 24 May 1968,” July 11, 1968, 4, R78/76/1, Written Archives Centre.

¹⁰⁷ “Science Consultative Group - Note of a Meeting Held on Friday, 24 May 1968,” 4.

¹⁰⁸ “Science Consultative Group - Note of a Meeting Held on Friday, 24 May 1968,” 5.

with the BBC was appreciative of the new series. In 1972, Bernard Dixon, then editor of *New Scientist*, praised *New Worlds* and shuddered at the thought of returning to the type of science programming that had characterized the first decades of the post-war period. “We desperately need programmes which portray science and its implications in an interesting and enticing way”, he wrote in *New Scientist*:

And *of course* lively techniques of presentation are vital; heaven forbid that we return to the earnest educational format, or the type of popular science purveyed by THE EXPERT which afflicted television in the early 1950s. As *Horizon* proves regularly, and as *New Worlds* has shown for the past few years on sound radio, science *can* be communicated to a wide audience by harnessing modern communications technique in a stimulating way to arouse interest and interpret scientific ideas.¹⁰⁹

Science journalists had by no means completely replaced scientists on the BBC’s airwaves – scientists still appeared in interviews and discussion programmes and delivered the occasional straight talk – but science journalists had certainly become an important part of the BBC’s designs for science broadcasting.

Just how important science journalists were perceived to be for the future of BBC radio can be seen by contrasting the launch parties of *Science Survey* and *New Worlds*. As mentioned in Chapter 4, to celebrate and advertise the launch of *Science Survey*, Ian Cox hosted a cocktail party for two dozen eminent scientists. To celebrate and advertise the launch of *New Worlds*, Mick Rhodes hosted a cocktail party for science journalists. In an August 1967 letter to management Rhodes wrote:

And before [*New Worlds*] starts I would like some sort of publicity occasion for science journalists at which we could say what we are trying to do. This presumably would mean a playback and a certain amount of alcoholic reinforcement.¹¹⁰

The BBC’s files for *New Worlds* contain no mention of whether a comparable amount of alcoholic reinforcement was provided for scientists, but the importance Rhodes placed on the event shows the extent to which the BBC felt it needed to cultivate science journalists as future contributors.

¹⁰⁹ Bernard Dixon, “Burke Special: An Obituary,” *New Scientist* 55, no. 807 (August 3, 1972): 226. Original emphasis.

¹¹⁰ Mick Rhodes to C.H.S. and M.P., “Magazine Programme - ‘Monday Through Friday,’” Memorandum, (August 23, 1967), R51/1269/1, Written Archives Centre.

9.6. ‘out into the open’

As for the content of the series, *New Worlds* appears to have followed through with its intention to broadcast a mixture of items – e.g. a mixture of hooking and hard-hitting items, ‘us’ items and ‘gee-whizz’ items – and in fact routinely received praise from listeners in this regard. The audience research report for the 21 March 1969 broadcast, for instance, noted that listeners appreciated the “stimulating mixture of interesting topics”,¹¹¹ while the report for the previous week’s broadcast relayed that: “Considerable interest was shown in ‘the variety of topics’”.¹¹² A look through the first 81 broadcasts of the series from October 1967 through December 1969 shows that within the series’ remit to focus on ‘us’ items it did indeed cover a wide range of topics, including: items on advances in computers, applied science and engineering; items on new household gadgets; items on advances in medical treatments and surgical procedures; reports on ‘gee-whizz’ science, e.g. recent discoveries in astronomy and natural history or the latest developments in space exploration; and investigative reports on the impact of science on society. And, of course, there were reports on that age-old English favorite, advances in weather forecasting. As one respondent put it in April 1969: “find me an Englishman who’s not interested in the weather!”¹¹³

True to Rhodes’ word, a good portion of the series was given over to lighter stories – what Rhodes had referred to as ‘hooking’ stories – including: a report by Gerald Leach on an American research submarine which “got itself attacked by a swordfish”;¹¹⁴ an interview between David Wilson and a doctor working in Cairo on a possible link between corsets and varicose veins;¹¹⁵ an interview about new ways of keeping beer from going flat;¹¹⁶ a report by Peter Fairley on new methods in beard shaving;¹¹⁷ and a short report on the Royal Danish Ballet’s efforts to aid space exploration by “volunteering for spinning tests in a special chair”.¹¹⁸ These last two

¹¹¹ Audience Research Department, “Audience Research Report: 21 March 1969,” 1.

¹¹² Audience Research Department, “Audience Research Report: ‘New Worlds’ - Friday, 14 March 1969,” April 9, 1969, 1, R9/6/205-208, Written Archives Centre.

¹¹³ Audience Research Department, “Audience Research Report: ‘New Worlds’ - Friday, 11 April 1969,” May 6, 1969, 1, R9/6/205-208, Written Archives Centre. Original emphasis.

¹¹⁴ Microfilm Script, *New Worlds* (BBC Radio 4 FM, January 12, 1968), 14, Radio Talks Scripts Pre-1970 (Film T361), Written Archives Centre.

¹¹⁵ Microfilm Script, *New Worlds* (BBC Radio 4 FM, February 16, 1968), 14, Radio Talks Scripts Pre-1970 (Film T361), Written Archives Centre.

¹¹⁶ Microfilm Script, *New Worlds* (BBC Radio 4 FM, March 22, 1968), 5, Radio Talks Scripts Pre-1970 (Film T361), Written Archives Centre.

¹¹⁷ Microfilm Script, *New Worlds* (BBC Radio 4 FM, March 8, 1968), 10, Radio Talks Scripts Pre-1970 (Film T361), Written Archives Centre.

¹¹⁸ March 8, 1968, 4.

reports were featured in a broadcast which the chairman promised would be composed of “a fine collection of zany stories”.¹¹⁹

But however much *New Worlds* succeeded in presenting a ‘stimulating mixture of interesting topics’, the aspect that set it apart from previous science series was Rhodes’ desire to carve out a place for probing, investigative journalism and stories that reflected “a rapidly advancing technological society with quickly altering norms.”¹²⁰ Alongside reports on swordfish attacks, organ replacements, rocket launches, and new household gadgets, the first dozen broadcasts of *New Worlds* included quite a few items which engaged with the events and upheavals of the day. These included: a ten-minute investigative report by Gerald Leach and Paul Vaughan on the detrimental health impacts of air pollution caused by coal-burning fires;¹²¹ an in-depth investigation by David Wilson into the spread of Foot and Mouth disease due to disinfectant procedures which were proving “comparatively ineffective”;¹²² an interview between Leach and a medical doctor on the topic of severe mental depression and suicide rates in the UK;¹²³ an interview between the science writer Angela Croome and a British beekeeping expert on the alarming rate at which bees were being killed by the use of pesticides;¹²⁴ a report by David Wilson on organ transplants and anti-smoking campaigns during which he broached “the fundamental question of how much a society can afford – or should afford – to save a life”;¹²⁵ and an interview between Leach and a metallurgist about the collapse of the ‘Sea Gem’, an oil rig off the coast of Lincolnshire that, as it turned out, was designed for the warm waters of the Gulf of Mexico and never should have been installed in the cold waters of the North Sea.¹²⁶ The sixth broadcast in the series even contained an interview between Leach and a food economist about the recent devaluation of the British Pound and the ways in which this would severely hinder the

¹¹⁹ March 8, 1968, 1.

¹²⁰ Rhodes, “Revised Brief for a Weekly Science Magazine,” 2.

¹²¹ Microfilm Script, *New Worlds* (BBC Radio 4 FM, October 20, 1967), 10, Radio Talks Scripts Pre-1970 (Film T360), Written Archives Centre.

¹²² Microfilm Script, *New Worlds* (BBC Radio 4 FM, November 24, 1967), 7, Radio Talks Scripts Pre-1970 (Film T361), Written Archives Centre. The broadcast featured a three-way interview between David Wilson, J.B. Brooksby, Director of the Animal Virus Research Institute at Pirbright, and David Engleheart, a farmer from Shropshire.

¹²³ Microfilm Script, *New Worlds* (BBC Radio 4 FM, November 17, 1967), 5, Radio Talks Scripts Pre-1970 (Film T360), Written Archives Centre.

¹²⁴ November 24, 1967, 16.

¹²⁵ Microfilm Script, *New Worlds* (BBC Radio 4 FM, December 22, 1967), 7, Radio Talks Scripts Pre-1970 (Film T361), Written Archives Centre.

¹²⁶ Microfilm Script, *New Worlds* (BBC Radio 4 FM, October 27, 1967), 6, Radio Talks Scripts Pre-1970 (Film T360), Written Archives Centre.

ability of poor families and the elderly to secure a sufficient amount of nutrition that winter.¹²⁷ The report demonstrates the wide net *New Worlds* cast around stories that might not initially appear to relate to science.

New Worlds did more than simply discuss the important issues of the day; it was also not afraid to challenge its interviewees. Paul Vaughan, for instance, introduced an investigative report by a journalist into clandestine electronic surveillance by commenting: “It was on this subject that the suspicious Rex Malik grilled a rather guarded Mr. Lovat.”¹²⁸ Furthermore, *New Worlds* was also not afraid to challenge its interviewees or its audience to take action to bring about positive change. Within the aforementioned piece on coal-burning fires and air pollution, for instance, Paul Vaughan interviewed Dr. G.A.W. Neall, a medical officer involved in the government’s efforts to convert 23,000 coal-burning fireplaces in the Barnsley area to cleaner fuels, and pressed the official as to why a project of such importance for public health was projected to take over 20 years to complete:

- Vaughan: Well whatever the reasons for all this, you’re not going to have complete smoke control for 23 years. How does it feel for you sitting in Barnsley to be pumping out black smoke over a pretty wide area of ... of your country?
- Neall: Well one’s conscious of it, and one realizes that one is using a realistic scheme to get rid of it. After all one – er – one can merely do one’s best with this.¹²⁹

Vaughan did not take this answer as sufficient, for he turned to the audience and finished with a call to action:

Well if you’re sitting now around a nice cosy smokey coal fire, all one can say is that you’re not doing your best. And even if you’re sitting around a smokeless fire, you’re still pouring out sulphur dioxide into the atmosphere because there’s no cheap way yet of doing anything about that. The harm it does? Not known for certain. Some day soon *New Worlds* hopes to tell you.¹³⁰

¹²⁷ November 24, 1967, 1–4.

¹²⁸ Microfilm Script, *New Worlds* (BBC Radio 4 FM, April 18, 1969), 3, Radio Talks Scripts Pre-1970 (Film T361), Written Archives Centre.

¹²⁹ October 20, 1967, 16.

¹³⁰ October 20, 1967, 16–17.

Thus, in addition to challenging the *New Worlds* audience to take action, Vaughan was positioning *New Worlds* as the entity that could inform the audience about the dangers of sulphur dioxide. This was different from saying that *New Worlds* hoped to be able to bring the experts to the microphone to inform the audience. Here Vaughan was setting *New Worlds* up as an important communicator in its own right.

Furthermore, within these programmes about controversial issues, presenters and contributors to *New Worlds* at times demonstrated a striking willingness to editorialize. Leach, for instance, began an April 1968 report on research into potential biological differences between different races or ethnicities by exclaiming:

This seems to be race hate week, when a lot of people with white skins are saying that people with black skins have disgusting habits and threaten our precious way of life, not because anyone knows that they have these habits, or haven't, but because they must have them, because they have black skins [...].¹³¹

Leach then went on to note with more than a touch of indignance that despite the confidence with which certain people made these claims, biologists were “finding it rather difficult” to establish just what those supposed differences might be.¹³² In 1965, the BBC's radio critic, J.D.S. Haworth, postulated that had it not come from the Science Unit, Rhodes' programme *Whales Against Man* might have been able to become “more indignant than it was”¹³³ about the need to take immediate action to save whales from extinction. Three years later, Leach apparently felt himself under no such restrictions.

Perhaps not surprisingly, *New Worlds* and its contributing journalists regularly approached reports on the impact of science on society with the same critical ethos discussed above in relation to *Biological Backlash*. Perhaps the most noteworthy example of this came in a 23 February 1968 broadcast produced by Rhodes which devoted nearly two-thirds of its half-hour runtime to an investigation of the dangers of chemical and biological warfare. The broadcast was occasioned by a recent conference in London on biological and chemical warfare, and featured Peter Fairley filling in for Leach as chairman. After an investigative report by Fairley on the dangers discussed at the conference, Fairley addressed the audience:

¹³¹ Microfilm Script, *New Worlds* (BBC Radio 4 FM, April 26, 1968), 6, Radio Talks Scripts Pre-1970 (Film T361), Written Archives Centre.

¹³² April 26, 1968, 6.

¹³³ Haworth, “The Spoken Word - Noises Off.”

Well, what we've given you is a terrifying story. [...] Science has made it possible to wipe out a million souls in a minute, and ever since, people have been struggling with their consciences.¹³⁴

Fairley then welcomed one of the conference's attendees, Lord Ritchie Calder, who discussed the damage done to science. "Surely the greatest conscience casualty in all this is science itself", Calder claimed:

While one group of scientists are lending their energies to prevent disease, another group is devising man-made epidemics. While one set of scientists is discarding chemicals and saying 'oh no, we dare not use that', another set is picking them out of the trash can, and saying 'you bet we can'. Ladies and Gentlemen this is the Jekyll and Hyde of Science.¹³⁵

"And unfortunately", Fairley responded, "unlike Jekyll and Hyde it's not fiction."¹³⁶

In wrapping up the report, Fairley explained why *New Worlds* had examined such a 'terrifying story' and in doing so highlighted the importance *New Worlds* placed on opening controversial topics up for public inspection and debate. "We've done so", he explained, "because we believe that the best defence against such things is to bring them out into the open – then people can make up their own minds."¹³⁷

As the 1960s came to a close, the BBC's major science series was not only organized around reports by science journalists, but was motivated by a desire to bring science out into the open so the public could debate its merits and potential drawbacks and join the conversation about how to proceed. Both fitted the current climate within the BBC and both represented a departure from the BBC's approach to science programming during the first two decades of the post-war period.

¹³⁴ Microfilm Script, *New Worlds* (BBC Radio 4 FM, February 23, 1968), 8, Radio Talks Scripts Pre-1970 (Film T361), Written Archives Centre.

¹³⁵ February 23, 1968, 8.

¹³⁶ February 23, 1968, 9.

¹³⁷ February 23, 1968, 8.

Chapter 10:

Conclusion

This thesis has examined the BBC's shifting approach to domestic, spoken-word science programming during the first quarter-century of the post-war period and has demonstrated that by the late 1960s the BBC no longer envisioned itself as a platform for scientists but as a communicator of science in its own right. As the BBC found its voice as a communicator of science, BBC producers and programme-developers began to see their job as the examination, interpretation and explanation of scientific developments to the British public, and increasingly favored programmes delivered by professional broadcasters or science journalists rather than by scientists. This fitted with a wider transition within BBC radio toward the delivery of news, topical, and current affairs programming, and toward a probing, investigative style of journalism. As a result of these changing priorities, BBC radio increasingly presented science not through straight talks, but through interviews, news-style reports, and documentaries – formats which placed broadcasters in a position to mediate science and scientists by explaining, contextualizing, and summarizing what scientists said. This was in stark contrast to the early years of the post-war period when Archie Clow had fancied himself a 'scientific impresario' and had conceived of his role as the presentation of scientists through 'the medium of scientists themselves'. This thesis has also shown that as the BBC embraced a more mediatory role, scientists were increasingly consigned to the role of contributor – thereby losing much of the direct connection to listeners which they had enjoyed during the early post-war period as well as much of the control they had exercised over the public image of science.

This final chapter summarizes the trends and developments detailed within the previous chapters in order to make sense of how and why science programming on BBC radio changed during the first quarter-century of the post-war period. Doing so will help provide a measure of understanding of recent developments in science communication – not just by clarifying how we got here, but by providing an understanding of the forces at play and how previous debates have played out.

10.1. *Twenty-five years on*

New Worlds exemplifies the changes that have been charted throughout this thesis. The trends which shaped science programming during this period can therefore be brought into high relief by comparing *New Worlds* to Clow's proposed reformulation of *Science Survey* and considering the extent to which Clow eventually got what he had campaigned for in his 1946 memorandum on the future of *Science Survey*.

As discussed in Chapter 9, *New Worlds* set out to focus on 'us items' that showed the impact of science on people's daily lives. The *Radio Times* billing for the series, in fact, promised listeners that the series would focus on the discoveries and inventions that were "going to affect our daily life".¹ Clow was Editor, Science Talks (Sound) – and thereby head of the Science Unit – during the development of *New Worlds* and was part of the large group of producers and programme-developers that collaborated on the development of the series. Considering he had attempted to overhaul *Science Survey* into a series that would focus on science and its impact on society (and had also produced a series entitled *Science & Everyday Life*), there would seem to be good deal of Clow's approach to science broadcasting in *New Worlds*. There was quite a big difference, however, in how the two series interpreted and implemented the remit to engage with the impact of science on everyday life.

For one thing, Clow had hoped to fashion his new version of *Science Survey* into a series that would not only deal with the impact of science on the present day, but the impact of science on the previous two hundred years of human social and technological advancement (see Chapter 4). Clow's approach to science broadcasting required what he called "a careful balance between disseminating information about recent advances (science as news) and presenting broad sweeps of the development of science".² *New Worlds* presented much of the former, but little of the latter. According to Rhodes, an item worthy of inclusion in *New Worlds* would have to be a "what's-happening-now item".³ It would have to answer the question: "what's round the corner that's going to develop from this?"⁴ As such, there was very little room within *New Worlds* for the type of historical information about science for which Clow had campaigned during his early years. Along those same lines, there was very little room in *New Worlds* for items on the impact of science on the underlying fabric of society. As a social technologist, Clow had wanted to

¹ "New Worlds," *The Radio Times*, no. 2297 (November 16, 1967): 82.

² Clow, "Observations on Science Survey," 4.

³ Rhodes, "Revised Brief for a Weekly Science Magazine," 2.

⁴ Rhodes, "Revised Brief for a Weekly Science Magazine," 2.

introduce listeners to the important but subtle ways that science impacted everyday life – e.g. through cheaper materials, stronger fabrics, more efficient industrial processes – but Rhodes’ science news magazine did not delve into this aspect of science and its impact on society. Clow had actually warned against such a one-sided approach. In his 1946 memorandum he wrote:

Perhaps this is a legacy of the Magazine days, but the result is that we get a series of snippets – usually about recent advances – that are not of great interest to a listening public still ignorant of the broad sweeps of scientific advance.⁵

Thus, although *New Worlds* set out to demonstrate the ways in which science was impacting the daily lives of listeners, it did not provide the historical-contextual material that Clow felt was crucial to helping listeners make sense of modern developments.

To a large extent this was a result of the newsification of science on BBC radio during the latter half of the 1960s for it was not only *New Worlds* that was focused on the material results of scientific research. As mentioned in Chapter 8, according to David Wilson, science in news and topical programmes tended across the board to focus on the practical results of scientific research. In 1966 he had informed the SCG that listeners to news and topical programmes were “naturally interested in the applied, practical result, of research rather than in ‘pure science’” and that there was therefore a weighting of output towards “the end-products” of scientific research.⁶ Along these same lines, there was also a weighting of output away from the processes or methods of science. When the mathematician and cosmologist Hermann Bondi suggested to a meeting of the SCG that “there was perhaps overmuch emphasis on results and not enough on the way they had been arrived at”, Wilson sympathized but responded that broadcasting “especially in its more topical aspects, had a natural tendency to concentrate on achievement.”⁷ When a scientist or research laboratory had a major breakthrough, “it was that fact and its significance that people were primarily interested in,” Wilson explained: “not the problems encountered on the way.”⁸ Considering *New Worlds* explicitly set out to emulate current affairs programmes like *Today* and *Ten O’Clock*, it is not surprising that it tended to focus on the ‘end-products’ of science rather than pure science or the scientific method.

⁵ Clow, “Observations on Science Survey,” 2.

⁶ Wilson, “Science Consultative Group - Science in News and Topical Programmes,” 3.

⁷ “Science Consultative Group - Note of a Meeting Held on Friday, 28 May 1965,” July 21, 1965, 4, R6/289/1, Written Archives Centre.

⁸ “Science Consultative Group - Note of a Meeting Held on Friday, 28 May 1965,” 4.

On a more fundamental level, *New Worlds* and Clow's proposed reformulation of *Science Survey* diverged in their interpretation of what exactly it meant to demonstrate 'the impact of science on everyday life'. While Clow's new version of *Science Survey* would have dealt with the positive aspects of science and its impact on everyday life, *New Worlds* dealt with both the positive *and the negative* aspects. This was a consequence of the fact that public perception of science had changed drastically in the intervening years and, alongside that change, the BBC's perception of how to serve the public had changed as well. In the first fifteen years of the post-war period when public perception of science was defined by "naïve optimism" in the possibilities and potentialities of science,⁹ the phrase 'science and its impact on everyday life' might have evoked visions of a brighter tomorrow made possible by science. The 1951 Festival of Britain had sold just such a vision.¹⁰ So, too, had many science programmes on BBC radio during that time. In fact, as discussed in Chapters 3 and 4, many BBC producers during the Second World War and into the early post-war period were committed to promoting an image of science as the engine of progress.¹¹ *Science & Everyday Life* promoted such a vision, and Clow's reformulated *Science Survey* would have promoted such a vision had it made it on the air. Much of *New Worlds* fitted within this tradition, but *New Worlds* also set out to engage with the potential negative aspects of science, and this is where the two series diverged. By the late 1960s when public perception of science had become more critical, the phrase 'science and its impact on everyday life' might have still evoked visions of a brighter tomorrow, but it just as easily might have evoked visions of birth defects, nuclear fallout, and silent springs. And since the BBC of the late 1960s was committed to engaging with the changing mood of the country,¹² the manner in which BBC producers and programme-developers engaged with the idea of 'science and everyday life' during the 1960s was far different from the way in which producers during the early post-war period had engaged with the same idea. Quite simply, by the late 1960s Clow's uncritical approach to science was out of date.

Despite the fact that *New Worlds* and Clow's overhauled version of *Science Survey* diverged when it came to content, the two series would still seem to share a number of similarities with respect to their styles of presentation. In 1946 Clow had called upon the BBC to put on the air a "lively, adventurous, and experimental" series aimed not at scientists but at the general public.¹³ Though it is difficult to gauge descriptors like 'lively' and 'adventurous' – one person's 'lively' is

⁹ Bowler, *Science for All*, 273.

¹⁰ See Forgan, "Festivals of Science."

¹¹ Desmarais, "'Promoting Science': The BBC, Scientists, and the British Public, 1930-1945," 34.

¹² Briggs, *Competition*, 5:338–39.

¹³ Clow, "Observations on Science Survey," 4.

another person's 'gimmicky' – both *New Worlds* and Clow's reformulation of *Science Survey* shared the desire to reach a general audience and to break away from reserved, straightforward formats.

New Worlds also utilized science journalists more than any series before it, which, on the surface, would seem to put it squarely in line with Clow's approach to science broadcasting. As discussed in Chapter 4, Clow had called upon the BBC to put on the air "a series of programmes not confined to two or three talks by experts, but using all the resources at our disposal",¹⁴ and had campaigned for the BBC to begin utilizing "competent publicists" who could step in and communicate science to the British public on behalf of scientists.¹⁵ Furthermore, in 1947 he had reiterated his stance that the science broadcaster "need not be the scientific expert",¹⁶ and in 1950 had called upon the BBC to begin utilizing what he called the "imaginative commentator or teacher"¹⁷ or "skilled scientific reporter".¹⁸ There is reason to question, however, whether the freelance science journalists employed by *New Worlds* – and by BBC radio more generally – were the type of 'competent publicists' Clow had envisioned.

From Clow's comments and correspondence throughout his career, it is clear that he envisioned his 'competent publicists' as exactly that: publicists. They would be sympathetic to scientists' goals and would work alongside scientists to advance those goals. Clow's competent publicist was therefore much closer to the early post-war conception of a science journalist as someone who would work to aid science – what Bruce Lewenstein has described as "advocates for science"¹⁹ and what Peter Bowler has called "sympathetic scribes".²⁰ Clow's terminology even started to gain a degree of currency within the BBC during the early post-war period. In 1950 the attendees of a 'Special Departmental Meeting on Home Service Plans' discussed the possible use of "interpreting publicists rather than experts" in programmes that attempted to communicate science to a general audience.²¹

Clow also expected his competent publicists to be trained in science – that was one of the things that turned a publicist for science into a '*competent* publicist' for science. In a 1960 letter to Harman Grisewood, for instance, Clow explained that in his view any science correspondent

¹⁴ Clow, "Observations on Science Survey," 5.

¹⁵ Clow, "Observations on Science Survey," 4.

¹⁶ Archie Clow to D.T., "Attached Correspondence on Science Broadcasting," Memorandum, (December 9, 1947), R51/523/6, Written Archives Centre.

¹⁷ Clow to A/C.T., "Science Broadcasts."

¹⁸ Clow to A.C.T., "Science Survey."

¹⁹ Lewenstein, "The Meaning of 'Public Understanding of Science' in the United States after World War II," 57.

²⁰ Bowler, *Science for All*, 265.

²¹ Chief Producer, Talks, "Special Departmental Meeting on Home Service Plans - 21.6.50," 3.

employed by the BBC would need to possess “an encyclopaedic knowledge of science and technology in all their ramifications”.²² In 1968 he explained to the SCG that it had taken longer than expected to recruit staff for the Science Unit since there were “not a great many journalists with scientific training”.²³

And finally, in order to be a ‘competent publicist’, one would need to communicate science in a respectful manner. Mention has already been made of Clow’s distrust of journalism and journalistic values when it came to the communication of science (see Chapter 8). His fear seems to have been that journalists would stress the startling aspects of science in an irresponsible manner. Indeed, in his 1960 letter to Grisewood, Clow explained that while a science correspondent employed by the BBC would certainly need to edit and present material in a manner that was acceptable to News Division – i.e. in a manner that abided by news values – it was imperative that doing so did not “jeopardize scientific integrity.”²⁴

Thus, in Clow’s mind, a competent publicist would need to: 1) be an advocate for science; 2) be trained in science; and 3) communicate science responsibly and with integrity. In effect, the type of person Clow envisioned as the perfect competent publicist was himself. He was not only sympathetic to scientists’ goals, but was trained in science, and took pains to communicate science in a responsible manner that did not endanger scientific integrity. Thus, although in 1950 Clow pointed to C.L. Boltz and A.W. Haslett as the type of person whom the BBC should employ as a reporter or commentator,²⁵ he was himself capable of fulfilling that role. From 1947 to 1952 Haslett served as presenter of *Scientists in Session*, the BBC’s annual series of broadcasts from the summer meeting of the BAAS,²⁶ but in 1955 Clow took over and served as presenter for the next 15 summers. Similarly, Clow routinely served as presenter for Boltz’s series *Science News* whenever Boltz was unavailable. Add to that the fact that Clow presented *Science Review* from 1959 through 1967, and a case can easily be made that Clow was his own best ‘competent publicist’, and was, in fact, one of the first figures to serve as a ‘science commentator’ for BBC radio. Clow was not only a ‘scientific impresario’, but a ‘competent publicist’, as well.

Most freelance science journalists, however, apparently did not qualify as ‘competent publicists’ when judged against Clow’s standards. Clow had previously cautioned against the use

²² Archie Clow to H.J.G. Grisewood, “Science Broadcasting,” Memorandum, (October 12, 1960), 2, R6/239/1, Written Archives Centre.

²³ “Science Consultative Group - Note of a Meeting Held on Friday, 24 May 1968,” 6.

²⁴ Clow to Grisewood, “Science Broadcasting,” 2.

²⁵ Clow to A.C.T., “Science Survey,” 2.

²⁶ It is not clear from the *Radio Times* who served as presenter for the series in 1953 or 1954.

of freelance science journalists by BBC radio. When Boltz stepped down from his position as Science Correspondent in 1960, Boltz suggested that the BBC abandon the idea of employing a full-time science correspondent and instead utilize freelance science journalists as needed. Clow disagreed. In his note to Grisewood he wrote:

To rely on free-lance contributors to service news would, I believe, be undesirable: (1) It delegates decisions to those possibly not sufficiently knowledgeable about the world of science as a whole. (2) There is an inadequate reserve of men of knowledge, experience, and integrity, and (3) When the Corporation was most in need of news, free-lance loyalty might well lie elsewhere – particularly if we relied on scientific reporters from Fleet Street.²⁷

Thus, when Clow judged freelance science journalists against his criteria for a satisfactory ‘competent publicist’, they were found wanting. The science journalists employed by *New Worlds* were likely not the type of knowledgeable, respectful, and loyal publicists for science that Clow had envisioned back in 1946. For two decades Clow had argued that the science broadcaster need not be the scientific expert, yet when the BBC finally acceded to that point, it employed science journalists who did not fit Clow’s conception of the type of communicator who should replace scientific experts.

Each of the next two sections draws out a key theme that has emerged from the trends detailed in the preceding chapters. First, the ways in which the BBC’s conception of the value and purpose of science programming changed during this period, and second, the relative loss of control scientists experienced when the BBC shifted to more journalistic, mediatory approach to science programming. Both have relevance for current debates about science communication.

10.2. A question of values and duty

By the late 1960s many BBC broadcasters and programme-developers would have similarly failed to meet Clow’s criteria for a good ‘competent publicist’. They certainly did not see themselves as ‘publicists’ or advocates for science, and rather than stressing scientific training had instead begun to stress journalistic training. Indeed, Rhodes had explicitly modeled *New Worlds* on two famous journalistic institutions: the Insight Team of the *Sunday Times* and William Hardcastle. It is also worth pointing out once again that despite the vote of confidence extended

²⁷ Clow to Grisewood, “Science Broadcasting,” 3.

to C.L. Boltz by *Nature* in 1959, the BBC's first domestic science correspondent was unsuccessful largely because he failed to "adjust himself to the needs of news."²⁸ The BBC's second domestic science correspondent, on the other hand, came from the news side of BBC radio, and inhabited the role for two decades.

In a 'lunch-time lecture' at Broadcasting House in February 1966, Aubrey Singer, then Head of Outside Broadcasts, Feature and Science Programmes (Television), reaffirmed this prioritization of journalistic skills and values when he asserted (twice) that whether or not a broadcaster had undertaken scientific training was "fundamentally unimportant".²⁹ Instead, Singer described the work of his department as "science journalism",³⁰ referring to the producers in his department as "creative and conscientious journalists"³¹ and praising their "individual journalistic initiative".³² And although Singer specified that his lecture had special bearing on "the problems of presenting science and technology to a general audience by means of television", he was also careful to point out that in so far as it touched on "broad aspects of mass communication" it could be "related to broadcasting generally".³³ There is, in fact, a nice bit of symbolism that whereas radio personnel like Clow had set the tone for science broadcasting on the BBC throughout the first years of the post-war period, by the mid-1960s it was television personnel like Singer who were setting the tone. When copies of Singer's lecture were distributed to the SCG in June 1966, George Camacho, Head of Talks and Current Affairs (Sound), spoke for radio and said that excepting Third Programme output – for which it had been found desirable to appoint a science graduate – he agreed with Singer that scientific training was less important than good journalistic skills and instincts.³⁴ The minutes further record that David Wilson "in support of Mr. Singer's thesis" pointed out to the scientists in the SCG that "many newspaper science correspondents, including some of the best ones, were journalists without any scientific training."³⁵

Importantly, as has been shown, the BBC of the mid- to late-1960s was not only enamored of journalism, but of a particular type of probing journalism that dovetailed nicely

²⁸ Camacho, "Science Broadcasts," 3.

²⁹ Aubrey Singer, "Science Broadcasting," in *BBC Lunch-Time Lectures: Series 4* (London: British Broadcasting Corporation, 1966), 8, 10.

³⁰ Singer, "Science Broadcasting," 8.

³¹ Singer, "Science Broadcasting," 13.

³² Singer, "Science Broadcasting," 12.

³³ Singer, "Science Broadcasting," 3.

³⁴ "Science Consultative Group - Note of a Meeting Held on Thursday, 2 June 1966," October 27, 1966, 5, R78/76/1, Written Archives Centre.

³⁵ "Science Consultative Group - Note of a Meeting Held on Thursday, 2 June 1966," 6.

with Hugh Greene's call for the BBC to facilitate and encourage the examination of views, opinions, and attitudes with a spirit of "healthy scepticism" (see Chapter 8).³⁶ This was the decade, after all, when social, political, sexual and religious traditions came under intense scrutiny. Science did not escape this skeptical and journalistic furor. The probing style of journalism then en vogue at the BBC served to open up science for criticism and analysis and in many ways made possible programmes like *Biological Backlash* which took a critical look at science and technology. Science, in the words of many at the time, had been politicized.

In his lunch-time lecture, Aubrey Singer, who would go on to serve as Managing Director of Radio, put this ethos into words most clearly and forcefully. "The aim of scientific broadcasting", Singer stated in 1966:

... is to create a climate of critical opinion, in which the work of the scientist can be understood, encouraged, and criticized, so that the body politic can intelligently share in and influence the course of science, directly through government, and indirectly by informed comment and discussion. [...] At least, achievement of this aspiration would mitigate against the application of purely emotional sanction to the scientist and his work. At most, it would subject science to the same order of intelligent scrutiny in which other fields of human endeavor have to operate.³⁷

Singer then commented that in defining this policy, broadcasting had "played an important role".³⁸ In implementing it over the coming years, broadcasting would be playing "a vital role."³⁹

It was this ethos that began to define the BBC's approach to science programming in the latter half of the 1960s. This was the meaning behind Rhodes' desire to fashion *New Worlds* into a journalistic enterprise that would "reflect a rapidly advancing technological society with quickly altering norms",⁴⁰ and it was the meaning behind Fairley's comment in *New Worlds* that the best defence against the 'Jekyll and Hyde' of science was to bring such things as biological warfare "out into the open" so people could "make up their own minds."⁴¹ Looking ahead, it was this ethos that was poised to influence the framing, content, and tenor of science programming in the 1970s.

³⁶ Smith, *British Broadcasting*, 182. Cited in Hollinshead, "The Production and Reception of Discourses Concerning Religion in Fictional Broadcasting," 75.

³⁷ Singer, "Science Broadcasting," 15.

³⁸ Singer, "Science Broadcasting," 15.

³⁹ Singer, "Science Broadcasting," 15.

⁴⁰ Rhodes, "Revised Brief for a Weekly Science Magazine," 2.

⁴¹ February 23, 1968, 8.

Importantly, the BBC's commitment to engaging with and reflecting whatever was happening in British society meant that the BBC had a duty to reflect public concerns about science and technology. The BBC prided itself on offering a wide range of programmes on science, including programmes on pure science, the scientific method or the material benefits of modern science, but as the British public became increasingly critical of and even antagonistic toward science in the latter half of the 1960s, the BBC felt it had a duty to reflect this as well.⁴² Indeed, when the journalist Malcolm Muggeridge presented an episode of *Tomorrow's World* in July 1969, scientists in the SCG objected to his reference to "the 'sinister aspects' of new devices" and bemoaned his "apparent antipathy to scientific subjects".⁴³ David Attenborough, however, then Director of Programmes (Television), responded that "Many people were worried about the progress of science, and it was right occasionally to reflect such feelings."⁴⁴ In fact, according to Singer, a BBC broadcaster could not help but engage with his or her cultural milieu. In his lunch-time lecture he explained that one of the "essential truisms" of broadcasting was that broadcasting "begins and ends with its audience!"⁴⁵ He continued:

We are middlemen, if indeed there can be middlemen in a cyclical situation, for the fact of the matter is that ideas and attitudes arise from the community at large. Our craft assimilates, manipulates, and amplifies these trends and then reflects this new image back whence it came. The point I make is that broadcasting is as affected by the climate of opinion as affecting the climate of opinion.⁴⁶

This disagreement over whether or not the BBC should reflect public concerns about science cuts to the core of one of the main questions of this period, namely: was it the BBC's duty to serve scientists or the public? As discussed in Chapter 4, in the early post-war period Clow had argued that the BBC had a duty to communicate the benefits of science to what he – and many others both inside and outside the BBC – perceived to be a largely ill-informed but positively-disposed audience. Doing so would ultimately aid scientists in their mission to bring the benefits of science to society, and therefore there was no contradiction involved in advocating that a public service broadcaster should promote science on behalf of scientists. What was good for scientists was good for the public. By this line of thinking, in a decade like the 1960s when public concern and antagonism toward science were on the rise, the BBC had a

⁴² This is discussed briefly in Bowler, *Science for All*, 274.

⁴³ "Science Consultative Group - Note of a Meeting Held on Friday, 7 November 1969," 3.

⁴⁴ "Science Consultative Group - Note of a Meeting Held on Friday, 7 November 1969," 3.

⁴⁵ Singer, "Science Broadcasting," 3.

⁴⁶ Singer, "Science Broadcasting," 3.

duty to allay public concern since doing so would enable scientists to return to their mission of bringing to society the benefits of science.

Professor D.C. Phillips, laid out his views on the matter for a meeting of the SCG in November 1969. According to the minutes of the meeting, Philips responded to Attenborough's assertion that the BBC had a duty to reflect public concerns about science by outlining what he took to be the BBC's duty in times of public antagonism toward science:

Professor Phillips said the country was at present witnessing a feeling of disillusionment with science, which had, quite naturally, followed the earlier feeling of euphoria engendered by the widening of horizons through greater knowledge and discovery. If the BBC tried only to follow public opinion it would find that it was in fact lagging behind. Its proper task at the present time was to lead opinion back to a middle way in which science was regarded objectively but without mistrust.⁴⁷

Phillips therefore envisioned the BBC as an organization that would work on behalf of scientists to improve the public image of science. In other words, Phillips, like Clow, envisioned BBC producers and programme-developers as publicists for science. As has been shown in the preceding chapters, however, the BBC of the late 1960s was never going to agree with this formulation of the BBC's duty.

Once again, it was Aubrey Singer, at a 1968 meeting of the SCG, who stated this point most directly and succinctly. During a discussion of the "science and society" programmes put out by the BBC, Professor Porter objected to the BBC's use of "intimidating" titles such as "Air Pollution in Cities".⁴⁸ According to the minutes of the meeting, Singer responded by explaining that within programmes on the "general theme of the impact of science on society" great care was taken "to see that they covered all the ground as thoroughly as possible, emphasising as necessary the good and the bad consequences of scientific achievement."⁴⁹ In contrast with Archie Clow who for two decades had served as a 'competent publicist' for science, Singer declared that he "did not see the BBC's role as a propagandist." Rather, the BBC's role was to "bear witness to the times."⁵⁰

⁴⁷ "Science Consultative Group - Note of a Meeting Held on Friday, 7 November 1969," 3–4.

⁴⁸ "Science Consultative Group - Note of a Meeting Held on Friday, 24 May 1968," 7.

⁴⁹ "Science Consultative Group - Note of a Meeting Held on Friday, 24 May 1968," 7.

⁵⁰ "Science Consultative Group - Note of a Meeting Held on Friday, 24 May 1968," 7.

10.3. A loss of control

In the early post-war period it might not have mattered quite so much to scientists whether BBC producers saw themselves as advocates for science or as critical journalists, for during those years scientists enjoyed a great deal of control over the framing and delivery of science programming on BBC radio. As such, scientists were able to be their own advocates and publicists. But the slow shift away from the straight talk format during the 1950s and 1960s meant that the seemingly direct connection to the audience which scientists had previously enjoyed within the straight talk format was slowly eroded. What is more, the relative control over the framing and delivery of science broadcasts which scientists had enjoyed within the straight talk format, was diminishing as well. Within chairman-led discussions or interview programmes, scientists found themselves joined at the microphone by BBC personnel or journalists; within the documentaries, enquiries, investigations and news reports which were coming to typify a more news-focused BBC radio, scientists could find themselves relegated to the role of contributor or even replaced altogether. Taken together, scientists had also begun to lose control over the content of science programmes. A number of factors combined to bring this about.

First of all, the increased status of the BBC meant that it could prioritize different criteria when deciding how to present programmes about science. As discussed in Chapter 4, in the early post-war period the Corporation had often felt compelled to form bonds with elite scientific institutions and secure talks from eminent scientists in order to bolster its own position within British society. By the end of the 1960s, however, the BBC had developed into one of the most powerful and important institutions in British society. The BBC therefore no longer needed to secure talks from eminent scientists simply to bolster its social standing, which meant that producers no longer needed to prioritize eminence and prestige over other criteria. The BBC could, and often still did, recruit eminent scientists to deliver talks, but it could do so on its own terms. Producers developing a series of talks on biochemistry or computing could be more discerning when deciding whom to allow access to the microphone, and could feel themselves under less pressure to select a ‘non-radiogenic’ speaker who happened to be a member of an elite scientific organization.

In fact, by the beginning of the 1970s, the dynamic which had existed between the BBC and elite scientific organizations during the early post-war period, had begun to invert itself: it was now the elite scientific organizations that occasionally turned to the BBC for help. In 1973, for instance, the Chemical Society came to the BBC asking for help in improving the image of

chemistry as an academic discipline and profession. According to the minutes of the November 1973 meeting of the SCG, the society had “turned to the broadcasters to help them in their difficulties” after being made aware of a survey conducted by the *Times* showing that the BBC was more influential than Parliament or the Church.⁵¹ The Chemical Society had hoped the BBC might see fit to broadcast a few positive programmes about chemistry to help it improve what one member of the SCG called “the present poor image of chemistry”.⁵²

Secondly, the BBC extended its control over the framing of science broadcasts on BBC radio. In the early post-war period producers in the Talks department had been able to frame science talks through their selection of speakers, by arranging discussions or debates between opposing viewpoints, suggesting possible themes, and even through the editing of scientists’ scripts (see Chapters 5 and 6). The BBC nonetheless relinquished considerable control over the framing of broadcasts by regularly giving scientists ultimate authority over their scripts and even allowing scientists to write their own interview questions (see sections 5.3 and 7.5 respectively). However, with the shift away from straight talks and scripted interviews towards recorded, edited, and packaged reports, BBC producers extended their control over the framing of science broadcasts. BBC producers and broadcasters could frame broadcasts by exercising control over the selection of interview questions, the editing of interview responses, the placement of pro/con arguments within a packaged report, and so on.

As interviews, news reports and documentary programmes grew more common and straight talks grew less common, the BBC also began to exert greater control over the on-air *delivery* of science programmes. The Features department had, of course, long been in charge of the delivery of science programming, but during the first decades of the BBC the Talks department had largely delegated that responsibility to scientists. By the mid-1950s this began to change. Even Clow himself had become much more in charge of the delivery of science content during his time at the BBC – especially from the late 1950s when he began presenting *Scientists in Session* and *Science Review*. Both series were not only built around interviews of scientists, but Clow routinely summarized scientific papers or lectures and provided crucial context for listeners. Thus, the BBC’s self-styled ‘scientific impresario’ had in fact become much more an actual on-air performer during the last half of his career. The BBC’s control over the on-air delivery of science content went beyond introductory material and context, however. As discussed in Chapter 9,

⁵¹ “Science Consultative Group - Note of a Meeting Held on Friday, 9 November 1973,” December 14, 1973, 5, R78/76/2, Written Archives Centre.

⁵² “Science Consultative Group - Note of a Meeting Held on Friday, 9 November 1973,” 5. The minutes were reporting the comments of Sir George Porter, chemist and Chairman of the SCG.

when Rhodes served as the presenter of the *Science Review* investigation into the Torrey Canyon oil spill, he not only served as interviewer, but as the lead investigator and guide by providing background material, context, explanations and summaries. He inhabited the role of an investigative journalist, while the scientists in the programme were reduced to contributors.

The two BBC figures most responsible for the on-air delivery of science content at this time were David Wilson and Colin Riach. Their entire remit as ‘correspondents’ was the production of science content. Often Wilson and Riach conducted interviews with scientists or delivered reports that featured short clips from previously recorded interviews, but Wilson and Riach each also routinely submitted solo reports in which theirs was the only voice heard by the listening audience. Throughout all of these interviews and documentaries, the BBC was not only exercising control over access to the microphone or the framing of a broadcast, but over the on-air delivery of that broadcast as well. By delivering content the BBC was moving away from its approach to science programming during the early post-war period.

Scripted talks delivered by eminent scientists were by no means set to disappear completely. The BBC still prided itself on delivering a spectrum of different formats and programme styles, and throughout this period remained committed to bringing scientists to the microphone. In 1946 R.A. Rendall had asserted that the BBC “must never give up the difficult task of persuading scientists themselves to shoulder the major responsibility of informing the public about scientific developments”,⁵³ and ten years later Clow had asserted that the BBC had “an obligation to present the scientist himself: to bring the authority to the microphone and present him to the public.”⁵⁴ Ten years after that, in his lunch-time lecture at Broadcasting House in 1966, Aubrey Singer reaffirmed this commitment. “After all,” he declared:

... in this day and age, when society puts up most of the money for research, the public has a right to hear direct from those responsible just as surely as the scientist has a duty to communicate the great revelations of science, not merely to his own small community but to the world at large.⁵⁵

Yet whereas in previous decades ‘bringing scientists to the microphone’ had largely meant handing over a period of time during which scientists could deliver scripted talks to the listening public, by the late 1960s ‘bringing scientists to the microphone’ meant interviewing scientists or

⁵³ Rendall to Grisewood, “Observations by Dr. Clow.”

⁵⁴ “The Presentation of Science to the Public,” 437.

⁵⁵ Singer, “Science Broadcasting,” 9.

inserting recorded comments into packaged reports. The BBC could still fulfill its promise to the public to bring scientists to the microphone, but scientists' voices were increasingly mediated by the BBC.

Finally – and crucially – as the BBC extended its control over the framing and delivery of science programmes, it began to exert greater control over the content of those programmes. This was in stark contrast to how things had stood during the first years of the post-war period (see Chapter 6). In 1956, Clow had explained to his audience at 'The Presentation of Science to the Public' conference that "the facts are the responsibility of the scientist: the treatment is open to discussion."⁵⁶ By the late 1960s, the facts were no longer the sole responsibility of the scientist, for producers and programme-makers were in a position to choose which facts were relevant to a given issue and therefore which facts to include in their investigative reports or radio documentaries. In the straight, lecture-style talks which had typified science programming during the first years of the post-war period scientists had been the authors of their own scripts, with ultimate authority over what they said on air. But in the mediated formats that grew increasingly common and popular during the late 1960s, BBC broadcasters, script-writers, and correspondents were the ones wielding ultimate authorial control over the content of their programmes.

As has been shown in Part II of this thesis, the 1960s not only witnessed the slow shift away from straight talks by scientists, but witnessed the arrival and slow acceptance of the freelance science journalist on BBC radio. In these cases, the BBC retained control over access to the microphone as well as a significant amount of control over the framing of a broadcast, but control over both the on-air delivery and content of that broadcast was outsourced to an outside writer or journalist. Many of these science writers and science journalists blurred the distinction between inside or outside personnel. Indeed, the first presenter of *New Worlds*, Gerald Leach, worked for the *Guardian*, the *Sunday Times*, and the *Observer* during the 1960s, but also worked for the BBC as a trainee studio manager and as co-producer of *Eye on Research*.⁵⁷ From the perspective of scientists, however, the distinction between whether a science journalist was employed directly by the BBC or only indirectly through a freelance contract, would have likely seemed beside the point, for the end-result was much the same: control over the framing, on-air delivery, and content of spoken-word science programming had to a large extent been taken out of the hands of scientists and placed in the hands of someone else.

⁵⁶ "The Presentation of Science to the Public," 438.

⁵⁷ Wright, "Obituary."

Scientists might have been satisfied with this arrangement had the BBC or the freelance science journalists it began to employ shared their view of the goal or purpose of science broadcasting. After all, more than a few scientists in the two and a half decades since the end of the war had argued that in certain cases scientists were not the best people to communicate science to the British public. In 1949 the Anderson Committee had ceded control over science programmes for the Light Programme audience, writing that such broadcasts were “best left to the skilled producer and scriptwriter”.⁵⁸ Furthermore, in 1949 Lawrence Bragg had implored the BBC to employ a “science commentator” who could provide listeners with “science news” (see Chapter 6),⁵⁹ and in 1959 *Nature* had praised the appointment of C.L. Boltz as the BBC’s first science correspondent (see Chapter 8).⁶⁰ But as discussed above, the professional broadcasters and science journalists who extended their control over science broadcasting in the 1960s stressed different values and requirements for science programmes than scientists.

These three realities of the late 1960s – a BBC that exercised greater control over the framing, delivery, and content of science programming than in previous decades; an increasingly concerned and critical British public; and a BBC that saw its duty as engaging with society through probing criticism of established orthodoxy and social norms – were poised to have an acute impact on the content and tenor of science broadcasting in the coming decade. From the point of view of scientists who might have wanted to use broadcasting to allay public concerns, these developments did not bode well.

10.4. Beyond the sixties: future research and present circumstances

As mentioned in the introduction, this thesis ends in 1970 with the retirement of Archie Clow. Examining the first quarter-century of the post-war period represented an attractive – and, perhaps more importantly, manageable – undertaking. However, as many historians have pointed out, decades do not always represent valid or satisfactory cut-offs when examining decades-long trends. The year 1970 marks the end of this thesis but not the completion of this story. The relationship between the BBC and the scientific world continued to develop and shift as the 1960s transitioned into the 1970s, as did the way in which this relationship manifested itself in the tenor, content, and format of the science programming produced by the BBC.

⁵⁸ Anderson, “GAC: Report,” 2.

⁵⁹ “GAC: Minutes of a Meeting on 16th August 1949,” 2.

⁶⁰ “Science Correspondent of the B.B.C.: Mr. C.L. Boltz.”

Indeed, as the 1970s approached, BBC radio once again moved to carve out a distinctive role for itself in a much changed media landscape. Viewing had long ago surpassed listening in terms of audience size and cultural importance and the style of radio listening had shifted from enrapt evening listening to more casual, background, and daytime listening. In an attempt to meet these challenges, the BBC decided to refashion and redistribute its radio programming across its four radio networks.

This was part of a plan developed by two ‘working groups’ within the BBC and published in July 1969 under the title, ‘Broadcasting in the Seventies’. The document explained that while there were still a few fields where radio had a “unique role”, it nonetheless had to “live with the other mass media, above all with television.”⁶¹ One of the unique roles to which radio could still lay claim was the delivery of news and current affairs:

In the television age, one field in which radio still has a really distinctive role is in news. Radio may lack the immediate impact of television as a news medium, but it can offer far more coverage, and more flexibility.⁶²

The report indicated that Radio Four would therefore increase its delivery of news and current affairs programming and become primarily devoted to speech, while Radio Three would become primarily devoted to music during the day and serious drama and high culture at night. Radio Three would continue to carry some speech, but many of the speech programmes currently on that network would be transferred to Radio Four.

The BBC explained what these changes meant for science broadcasting at the meeting of the SCG in November 1969. R.D’A. Marriot, Assistant Director (Radio) – and one of the men responsible for developing many of the ideas within ‘Broadcasting in the Seventies’ – assured the scientists in the group that despite the shuffling of programming there “would not be any serious decrease in the time provided for science on radio”.⁶³ Lord Archie Gordon, Programme Editor, Arts, Science and Documentaries (Radio), further explained that while “major science programmes” would in the future be placed on Radio Four, this did not imply that there would be any “dilution in the content of such programmes”, nor would Radio Three cease to carry

⁶¹ British Broadcasting Corporation, *Broadcasting in the Seventies: The BBC’s Plan for Network Radio and Non-Metropolitan Broadcasting* (London: British Broadcasting Corporation, 1969), 2.

⁶² British Broadcasting Corporation, *Broadcasting in the Seventies*, 5.

⁶³ “Science Consultative Group - Note of a Meeting Held on Friday, 7 November 1969,” 7.

science programmes altogether.⁶⁴ Despite these continuities, there were to be a number of important changes. For one thing, BBC radio was particularly keen to continue the expansion of science news. As mentioned briefly in Chapter 8, Marriot explained to the SCG that Radio Four “would provide increased opportunities for science news, for the presentation of which radio, as a medium, was particularly suited.”⁶⁵ Gordon, further explained that certain types of science programming might not be able to emigrate to Radio Four. “Provision for speech programmes on Radio 3 would be reduced by about 50%”, he informed the SCG: “and the straight, scripted talk might be difficult to place on Radio 4.”⁶⁶ As the BBC transitioned from the 1960s to the 1970s, not only was science news due to increase, but the straight, scripted science talk, which had once defined science programming on BBC radio during the first decades of the post-war period, was due to become significantly less common.

In light of the profound impact these changes were poised to have on science programming in the coming years, future research could look at the next decade – or two – of science broadcasting on the BBC and examine:

- whether the trend toward science news on BBC radio continued, and how science was covered within news and current affairs programmes;
- whether the BBC continued to utilize freelance science journalists in the delivery of science programming;
- whether the trend toward mediating scientists continued, and whether the BBC continued to extend its control over the framing and delivery of science programmes;
- whether *New Worlds* continued to prize hard-hitting journalism and, if so, what happened to hard-hitting science journalism after the cancellation of *New Worlds* in 1973;
- whether the BBC continued throughout the 1970s to prize programmes that brought science ‘out into the open’ and, if so, whether this changed in the 1980s and why;
- how science programming on BBC radio differed from science programming on BBC television; and
- whether the BBC continued to produce programmes that reflected public concerns about science and, if so, how scientists reacted to these programmes.

⁶⁴ “Science Consultative Group - Note of a Meeting Held on Friday, 7 November 1969,” 7.

⁶⁵ “Science Consultative Group - Note of a Meeting Held on Friday, 7 November 1969,” 7.

⁶⁶ “Science Consultative Group - Note of a Meeting Held on Friday, 7 November 1969,” 7.

With regards to this last question, there are initial signs that many scientists were less than pleased with the BBC's coverage of science during the 1970s – at least judging by the reaction of scientists serving within the SCG. Throughout the 1970s, in fact, scientists in the SCG routinely expressed their dissatisfaction with the framing, delivery, content, and tenor of the BBC's science programming. These criticisms were so common and recurrent, that in 1980 the physicist Ieuan Maddock, then chairman of the SCG, produced a two-page catalogue of “perennial issues” which had dominated SCG meetings during his decade-long tenure in the group.⁶⁷ Maddock explained that experience “over several years of the existence of the SCG” had shown that much of the group's time had been spent discussing “a particular genre of problems – sometimes at length and with passion.”⁶⁸ He proceeded to list grievances related to the framing and delivery of BBC science programming such as “distortion”, “skew”, “trivialization”, and an irresponsible approach to “alarmist programmes”.⁶⁹

According to Maddock's catalogue of recurrent grievances, scientists in the SCG often felt BBC programmes were unbalanced and accused BBC producers of too often letting their personal biases show through within their programmes. Scientists in the group had routinely expressed the feeling that within documentaries and investigative reports, BBC producers and broadcasters were wont to skew the “presentation of fact or juxtaposition of facts” in order to lead the audience “to a particular set of conclusions.”⁷⁰ This distortion and skew often entered in “the editing phase”, these scientists argued, where “countervailing facts and arguments had been (deliberately or accidentally) omitted.”⁷¹ In some cases scientists put this down to producers who got carried away with their desire to tell a story, while in other cases scientists accused broadcasters of being too willing or perhaps too eager to criticize science.

Bernard Dixon, editor of *New Scientist* from 1969 to 1979, offered a similar critique of BBC science programming in the 23 October 1980 edition of the BBC's own publication, *The Listener*. In a two-page article, Dixon lamented that, in his opinion, throughout the 1970s programmes on science and technology had too often exhibited “an insistent tendency” to deal

⁶⁷ Ieuan Maddock, “A Discussion Note for the Science Consultative Group,” June 4, 1980, 2, R78/76/3, Written Archives Centre.

⁶⁸ Maddock, “Discussion Note for the SCG,” 1.

⁶⁹ Maddock, “Discussion Note for the SCG,” 1–2.

⁷⁰ Maddock, “Discussion Note for the SCG,” 1.

⁷¹ Maddock, “Discussion Note for the SCG,” 1.

with scientific issues “in partisan fashion.”⁷² “Science and technology have indeed become ‘politicised’”, he wrote:

So, too, has public presentation of science and technology, with a regular stream of programmes on the most recently discovered drug side effects, environmental risks posed by the chemical industry, or infamy allegedly committed on laboratory animals.⁷³

Yet while Dixon was convinced that these programmes had “unquestionably been a major contribution to public debate over issues formerly resolved in virtual secrecy by specialists”, he worried that such programmes too often pursued what he called a “strong story line”⁷⁴ characterized by “outrage and the crusading motive”.⁷⁵ Future research could explore the ‘politicization’ of science programming on the BBC during the ‘long seventies’.

Maddock’s catalogue of recurrent grievances also recorded that many scientists who took part in programmes of this sort – i.e. those programmes which scientists took to be unbalanced, unfair, or unnecessarily critical of science – often contended that the intentions of the broadcaster in charge of the programme “had not been made clear” to scientists during the production process.⁷⁶ Had they known that their contribution was going to be used in such a way and for such a programme, they would have refused.⁷⁷ Maddock reported that as a way of forestalling these issues, scientists in the SCG regularly expressed the view that when scientists took part in an interview, documentary or investigative report, those scientists should “have the right to examine and comment upon the final edited version before release.”⁷⁸ Thus, in an effort to reassert control over the framing of science broadcasts, scientists in the SCG explicitly argued that when it came to science programmes scientists had a right to oversight. The BBC, not surprisingly, had consistently resisted these efforts at capturing some of their professional jurisdiction, and, according to Maddock’s telling, repeatedly argued that giving scientists final say would lead to a ‘skewing’ of science broadcasts in favor of scientists and would, in itself, amount to a “form of censorship”.⁷⁹ Considering what this thesis has shown with regards to the amount of additional control the BBC came to exert over the framing and delivery of science

⁷² Bernard Dixon, “The Didactic Element Is Often Missing,” *The Listener*, no. 2684 (October 23, 1980): 531.

⁷³ Dixon, “The Didactic Element Is Often Missing,” 531.

⁷⁴ Dixon, “The Didactic Element Is Often Missing,” 531.

⁷⁵ Dixon, “The Didactic Element Is Often Missing,” 532.

⁷⁶ Maddock, “Discussion Note for the SCG,” 1.

⁷⁷ This was discussed in more depth at the May 1968 meeting of the SCG. See: “Science Consultative Group - Note of a Meeting Held on Friday, 24 May 1968,” 8–10.

⁷⁸ Maddock, “Discussion Note for the SCG,” 1.

⁷⁹ Maddock, “Discussion Note for the SCG,” 1.

programmes, the reaction of scientists within the SCG is not unexpected. Once a scientist had taken part in an interview with a BBC broadcaster, their voice, as it were, was in that broadcaster's hands. Future research could look at the long seventies in order to examine in greater depth this contest of control between scientists and the BBC.

Throughout the 1970s, scientists in the SCG also repeatedly accused the BBC of being overly focused on stories meant to either astound or terrify the audience – or, as Maddock put in his catalogue, the BBC exhibited a “bias towards the ‘gee-whizz!’ and ‘oh my God!’ programmes”.⁸⁰ ‘Gee-whizz!’ science programmes, were described as programmes that focused on ultimate mysteries of the universe with the intention of leaving audiences with a sense of awe, while ‘oh, my God!’ science programmes focused on the perceived dangers of science and technology with the intention of leaving the audience with a sense of impending doom. Eight years earlier, in fact, Maddock had made a similar bipartite distinction, referring to the former as “wonder and awe” and the latter as “the doom watch category”.⁸¹ Scientists in the SCG were not the only people to make this criticism of BBC science programming during the 1970s. In the 3 January 1974 edition of *The Listener*, David Wade, critic for the *Times* wrote: “In my experience, BBC Radio has looked at science chiefly in two ways: first as technology, second as Frankenstein’s monster.”⁸² By ‘Frankenstein’s monster’ he meant programmes that argued over the potential dangers of science or over the morals and ethics of science. Indeed, that same week, in the 5 January 1974 edition of the *Times*, Wade wrote of what he took to be the troubling “technological and ethical imbalance of radio science”.⁸³ Taken together, then, there appears to have been a general feeling that in the 1970s the BBC focused overly much on technological developments, wonder and awe, and potential negative impacts of science. Future research could look at whether there truly was a tendency towards these types of programmes during the long 1970s.

According to Maddock, over the course of the 1970s, scientists in the SCG expressed concern that this bias toward ‘gee-whizz!’ and ‘oh my God!’ programmes had resulted in

⁸⁰ Maddock, “Discussion Note for the SCG,” 2.

⁸¹ “Science Consultative Group - Note of a Meeting Held on Friday, 17 November 1972,” January 15, 1973, 7, R78/76/2, Written Archives Centre. The fact that ‘doom watch’ was written as two words and was not capitalized or included in quotes suggests that Maddock was speaking of the general term rather than the television series that ran from 1970-1972. Regardless, both deal with efforts to combat dangers posed by scientific and technological achievements.

⁸² David Wade, “Letters - Science on Radio,” *The Listener*, no. 2336 (January 3, 1974): 20.

⁸³ David Wade, “Backward Glances,” *The Times*, January 5, 1974, sec. Arts and Entertainment, 6, The Times Digital Archive.

“insufficient coverage (in a kindly light) of less glamorous but more socially-economically valuable scientific activities.”⁸⁴ Maddock’s explicit contention that the BBC should produce more programmes that treated science ‘in a kindly light’, highlights one of the core assertions implicit in Maddock’s catalogue of recurrent grievances: that in a time when public concern and antagonism toward science was already quite high, the BBC should not be stoking the flames of public discontent with what scientists perceived to be irresponsible programmes on the dangers of science, but rather, should be actively working to provide positive publicity for science. This thesis has shown that in the 1960s, the BBC saw its role not as a provider of publicity for science, but as a provider of journalistic programmes that opened up all aspects of science to critical examination by the public. Future research could examine if and when the BBC’s conception of its duty began to shift.

Recent decades have witnessed the continuation of these debates about the role of the BBC. The developments detailed in this thesis therefore not only elucidate the changes that the BBC underwent during the post-war period, but help make sense of developments in science communication over the past few decades. Indeed, the debates taking place today not only have historical precedents, but are in many ways the result of how those previous debates played out. If the quarter-century following the end of the Second World War witnessed the rise of professional science journalism,⁸⁵ then the past twenty-five years have witnessed the rise of professional public relations for science. Motivated in part by a belief that public neglect of science had been caused by a failure of the mass media, scientists and elite scientific organizations in the 1980s and 1990s began to argue that scientists should move to take back control of the communication of science and should see it as their duty to communicate science to the British public.⁸⁶ Over the past twenty-five years, universities, research laboratories, and learned societies have increasingly employed and deployed in-house press officers – what Brian Trench has called ‘embedded’ science writers or communicators⁸⁷ – to mediate public debates about science. Thus, whereas the relationship between scientists and the public was increasingly mediated by science journalists from the 1960s, the rise of public relations for science since the late 1980s has placed yet another would-be mediator in the equation. This not only complicates the public domain by placing two mediators between scientists and the public, but entrusts the

⁸⁴ Maddock, “Discussion Note for the SCG,” 2.

⁸⁵ Gregory and Miller, *Science in Public*, 38.

⁸⁶ Bauer and Gregory, “From Journalism to Corporate Communication in Post-War Britain,” 40.

⁸⁷ Brian Trench, “How the Internet Changed Science Journalism,” in *Journalism, Science and Society: Science Communication between News and Public Relations*, ed. Martin W. Bauer and Massimiano Bucchi (Abingdon: Routledge, 2007), 134.

communication of important information about science to two mediatory groups that, as has been seen throughout this thesis, will often find themselves working at cross-purposes – not least because they serve different masters and strive for different goals. As Bauer and Gregory write:

Journalists strive to inform the public, raise attention, entertain [...]. In terms of professional ethos, the journalist can claim to be a trustee of public interests, and to function as a Fourth Estate in modern governance. [...] The PR professional, on the other hand, aims to design a favourable image of the corporation she works for [...] and undertakes damage limitation during crises. The ethos of the PR person is the professional cultivation of a favourable corporate image in the public.⁸⁸

Archie Clow might have been comfortable serving in public relations for science – his ideal communicator was a ‘competent *publicist*’, after all – but Mick Rhodes and Aubrey Singer likely would not have been. As far as Rhodes and Singer were concerned, the role of the BBC during the late 1960s was as a probing journalist, not a publicist.

Though the BBC of the late 1960s felt it could best serve the public by subjecting science to journalistic scrutiny, there is evidence that the BBC of the twenty-first century no longer treats science and scientists with the same degree of healthy skepticism. BBC science journalists almost certainly do not consider themselves as working to garner positive publicity for scientists, but one recent study suggests that the BBC’s science news is to a significant extent derived from and dependent upon press releases issued from the press offices of scientific bodies and institutions.⁸⁹ According to the study, BBC journalists “rarely deviate from the overall framing of the story offered in the press release” and seldom include independent comment sourced from individuals or institutions not connected to the original press release.⁹⁰ In these cases, by adopting the framing and narrative of PR professionals rather than seeking to supply context and alternative viewpoints, BBC journalists have surrendered a degree of their role as mediators. It should perhaps be cause for concern, then, that at a time when the position of the science journalist is growing increasingly precarious,⁹¹ the science journalists that survive are increasingly

⁸⁸ Bauer and Gregory, “From Journalism to Corporate Communication in Post-War Britain,” 45.

⁸⁹ Felicity Mellor, Stephen Webster, and Alice R. Bell, “Content Analysis of the BBC’s Science Coverage” (London: Imperial College London, 2011).

⁹⁰ Mellor, Webster, and Bell, “Content Analysis of the BBC’s Science Coverage,” 70.

⁹¹ Andy Williams and Sadie Clifford, “Mapping the Field: A Political Economic Account of Specialist Science News Journalism in the UK National Media,” Project Report (Cardiff University, 2008); see also Bauer and Gregory, “From Journalism to Corporate Communication in Post-War Britain,” 45–46.

reliant upon PR materials issued from scientific institutions. Programmes that seek to bring important matters involving science ‘out into the open’ as Rhodes and his colleagues sought to do throughout the latter half of the 1960s, may become increasingly rare.

Epilogue

At the May 1970 meeting of the Science Consultative Group, Dr. D.C. Martin, Executive Secretary of the Royal Society and Chairman of the SCG, informed the members of the group assembled before him that Archie Clow, Editor, Science Talks (Radio), “would shortly retire from the BBC, after twenty-five years’ service.”⁹² The minutes of the meeting record the tributes and expressions of gratitude that followed:

Dr. Clow had performed an invaluable service to science [through the medium of] radio, which was unmatched by any other broadcasting organisation. [Martin] wished to record, on behalf of the Science Consultative Group, the very high regard in which Dr. Clow’s work was held. Mr. [G.B.R.] Fielden in a personal tribute, said he had first met Dr. Clow in 1946, to discuss the production of a programme on jet engines. He would always remember the care with which Dr. Clow approached problems. His work had had a profound effect on the BBC’s science programmes on radio.⁹³

It must have been a touching and meaningful tribute for a man who had come to the BBC in 1945 with the expressed goal of aiding both science and society by broadcasting scientific information on radio, and who had often seen himself as engaged in a cooperative effort with scientists to communicate the importance of science to the British public.

In the three years between the cancellation of his three long-running series (*Science Survey*, *Who Knows?* and *Science Review*) and his retirement from BBC radio, Clow continued to produce programmes for BBC radio, and appears to have imbibed an element of the more critical ethos then en vogue within the BBC. In November 1969, Clow served as producer for Frank Fraser Darling’s series of Reith Lectures, *Wilderness and Plenty* – six talks during which the English ecologist explored the ways in which humanity’s “increasing technological skill and control” tended to blind it to the “variety and magnitude of the problems we are creating.”⁹⁴ It was Clow, in fact, who first suggested the BBC select Darling to give the Reith Lectures that year, and it

⁹² “Science Consultative Group - Note of a Meeting Held on Friday, 15 May 1970,” June 16, 1970, 2, R78/76/1, Written Archives Centre.

⁹³ “Science Consultative Group - Note of a Meeting Held on Friday, 15 May 1970,” 2.

⁹⁴ Frank Fraser Darling, “Waste, Want and Wilderness: Reflections on the Environmental Crisis,” Memorandum, (Undated), R51/1253/1, Written Archives Centre.

was Clow who championed Darling's proposed series throughout the selection process.⁹⁵ In an article distributed to advertise the series, Clow explained why he felt Darling's thesis was so important, writing that while mankind had become "ingeniously technological" over the past centuries, he had also:

... encroached on the wilderness [...]. He raped and plundered the vast acreage of plants that produced even the oxygen he breathes. He deluded himself that he had nature on the run and intended to keep her on the run. But his predations, ingenuity, and the sheer sophistication of his activities polluted his environment [...].⁹⁶

It was an impassioned plea for conservation from a man who during his early years at the BBC had routinely framed the previous two centuries of human advancement as a story of man's conquest of nature through the application of scientific knowledge and know-how. Indeed, the theme for the May 1950 series of *Science & Everyday Life* had been an exploration of mankind's mastery of the limitations set before him by nature.⁹⁷ By 1970, however, Clow appears to have rejected much of this narrative and adopted a more ecologically-minded approach.

⁹⁵ J.A. Camacho to M.D.R., "Reith Lectures," Memorandum, (April 1, 1969), 2, R51/1253/1, Written Archives Centre.

⁹⁶ "Wilderness and Plenty: By Dr. Frank Fraser Darling, F.R.S.E.," Promotional Leaflet, (1969), R51/1253/1, Written Archives Centre.

⁹⁷ Clow to A/C.T., "F.E.B. Series IV 1950."



Figure 14: Archie Clow and Frank Fraser Darling prepping for the 1969 Reith Lectures.⁹⁸

Clow also seems to have adopted an element of the probing and questioning ethos then dominating the BBC. One of the last series he produced was a six-part series entitled *Morals and Medicine*, which ran from 6 January to 10 February 1969. Writing in the *Radio Times* Clow explained that while many people were talking about living “in the shadow of the bomb”, it was:

... nearer the truth to say that it’s the shadow of ourselves that we’re living in. The application of biology [...] has already transformed the human scene to make it the human dilemma. And the floodgates are only just open.⁹⁹

The series examined pressing social, political, and ethical questions related to advances in biology, including: population control, abortion, birth control, experiments involving human subjects, the proper aims of psychiatry, and ‘Genetics and Moral Responsibility’. Yet although Clow appears to have adopted an element of the critical and probing ethos popular at the BBC during this period, he does not appear to have embraced the new formats being utilized within the Talks department. *Morals and Medicine* was, in the end, presented not as an enquiry or documentary or even as a set of interviews, but as a series of straight lectures delivered by eminent thinkers followed by a period of questions and answers. As such, the eminent figures in

⁹⁸ “In Pictures.”

⁹⁹ Archie Clow, “The Hungry Nineties?,” *The Radio Times*, no. 2356 (January 2, 1969): 38.

the series were put in a position to make authoritative statements on their areas of expertise. Clow, it seems, was a ‘scientific impresario’ to the end.

After leaving the Talks department, Clow served as a producer of audio programmes and course materials for BBC Open University courses. His productions included ‘Theory of Relativity’,¹⁰⁰ ‘Giant Molecules’,¹⁰¹ and ‘Science and Society’.¹⁰² In 1973 he even got to produce two programmes that were distinctly within his area of expertise, ‘Innovation in 19th Century Technology’¹⁰³ and ‘The Alkali Industry’.¹⁰⁴ The latter programme was a 24-minute documentary film during which Clow visited important sites in the history of the alkali industry and explained their significance. The man who had helped to found the Scientific Film Club in Aberdeen before moving to radio for a quarter-century, eventually returned to film to star in his own educational science film.¹⁰⁵

That same year, on 10 February 1973, Nan passed away, bringing their 36-year marriage to an end. Twenty-three years later, on 14 December 1996, Archie passed as well. His ashes were scattered in the Cairngorms near an old iron bridge over the Am Beanaidh.

Upon his death, Archie bequeathed one thousand pounds to the University of Aberdeen with directions to found an annual prize in chemistry. The ‘Archibald Clow Prize in Chemistry’ is awarded for outstanding performance in second year chemistry, and is awarded to this day.

¹⁰⁰ *Theory of Relativity*, Audiotape, S100 Science Foundation Course (BBC Open University, 1971), Walton Hall Library Archive.

¹⁰¹ *Giant Molecules*, Audiotape, S100 Science Foundation Course (BBC Open University, 1972), Walton Hall Library Archive.

¹⁰² *Science and Society*, Audiotape, S100 Science Foundation Course (BBC Open University, 1972), Walton Hall Library Archive.

¹⁰³ *Innovation in 19th Century Technology*, Audiotape, AST281 Science and the Rise of Technology Since 1800 (BBC Open University, 1973), Walton Hall Library Archive.

¹⁰⁴ *The Alkali Industry*, Videotape, AST281 Science and the Rise of Technology Since 1800 (BBC Open University, 1973).

¹⁰⁵ In 1980 the Open University awarded Clow an honorary Doctorate, pushing his total number to three. “University News,” *The Times*, January 3, 1980, 60514 edition, sec. Official Appointments and Notices, 12, The Times Digital Archive.



Figure 15: Archie and Nan (right) at the Waldorf Hotel in 1961.¹⁰⁶

¹⁰⁶ “Section Activities: Annual Dinner Dance,” *Journal of the Royal Institute of Chemistry* 85, no. December (1961): 456. The Clows were attending the Annual Dinner Dance of the London Section of the Royal Institute of Chemistry where the two were honored as “special guests”.

Bibliography

Archival Sources

BBC Written Archives Centre, Peppard Road, Caversham Park, Reading, RG4 8TZ

Royal Society Library and Archives, 6-9 Carlton House Terrace, London SW1Y 5AG

Royal Institution Archives, 21 Albemarle Street, London W1S 4BS

University of Aberdeen, Special Collections, Wolfson Reading Room, Sir Duncan Rice Library, Aberdeen AB24 3AA

The Open University Library Archive, Walton Hall, Milton Keynes, MK7 6AA

BBC Genome Project (*Radio Times*), <http://genome.ch.bbc.co.uk/>

The Listener Historical Archive, Gale Cengage Learning, <http://www.gale.com/c/the-listener-historical-archive>

The Sunday Times Digital Archive, Gale Cengage Learning, <http://gale.cengage.co.uk/sunday-times-digital-archive.aspx>

The Times Digital Archive, Gale Cengage Learning, <http://gale.cengage.co.uk/times.aspx/>

British Newspaper Archive, British Library, <https://www.britishnewspaperarchive.co.uk/>

New Scientist Archive, via Google Books, <https://www.newscientist.com/issues/>

Nature Archive, <http://www.nature.com/nature/archive/index.html>

Other Primary Sources

Anonymous. "A.W. Haslett." *Nature* 223, no. 5205 (August 2, 1969): 433–548.

Anonymous. "BBC Requires Science Correspondent." *The New Scientist* 4, no. 104 (November 13, 1958): 1238–92.

- Anonymous. "British Broadcasting Corporation Science Unit." *Nature* 184, no. 4696 (October 31, 1959): 1361–1361.
- Anonymous. "Science Correspondent of the B.B.C.: Mr. C.L. Boltz." *Nature* 183, no. 4670 (May 2, 1959): 1215–86.
- Anonymous. "Scientific Film Conference." *Nature* 150, no. 3799 (August 22, 1942): 217–44.
- Anonymous. "Section Activities: Annual Dinner Dance." *Journal of the Royal Institute of Chemistry* 85, no. December (1961): 429–68.
- Anonymous. "The B.B.C. 'Science Survey': Dr. Archie Clow." *Nature* 173, no. 4396 (January 30, 1954): 177–224.
- Anonymous. "The Presentation of Science to the Public." *Journal of the Royal Institute of Chemistry* 80, no. August (1956): 437–56.
- Anonymous. "University News." *The Times*. January 3, 1980, 60514 edition, sec. Official Appointments and Notices. The Times Digital Archive.
- Boltz, Cecil Leonard. *Basic Radio*. New York: Ronald Press Co., 1944.
- . *Everyman's Wireless*. G.G. Harrap & Co.: London, 1932.
- . *Wireless for Beginners*. Pl. 5. G.G. Harrap & Co.: London, 1933.
- British Broadcasting Corporation. *Broadcasting in the Seventies: The BBC's Plan for Network Radio and Non-Metropolitan Broadcasting*. London: British Broadcasting Corporation, 1969.
- Calder, Nigel. "How New Scientist Got Started (Classic Article from 1966)." *New Scientist*, November 16, 2006. <https://www.newscientist.com/article/dn10574-how-new-scientist-got-started/>.
- Clow, Archibald. "Chemistry on the Air." *Journal of the Royal Institute of Chemistry* 77 (January 1, 1953): 573–78.
- . "Diamagnetic Investigation of Urea and Thiourea Derivatives." PhD Thesis, Aberdeen University, 1934.
- . "The Chemical Constitution and Diagnetism of Sulphur." DSc Thesis, Aberdeen University, 1940.
- Clow, Archibald, and Nan Louise Clow. "Lord Dundonald." *The Economic History Review* a12, no. 1–2 (October 1, 1942): 47–58.

- . *The Chemical Revolution: A Contribution to Social Technology*. London: Batchworth Press Limited, 1952.
- Clow, Archibald, and James M.C. Thompson. “The Diamagnetism of Organic Sulphur Compounds.” *Transactions of the Faraday Society* 33, no. 0 (January 1, 1937): 894–904.
- Cox, Ian. “Eskimo Remains on Akpatok Island, North-East Canada.” *Man* 33 (April 1933): 57–61.
- Dixon, Bernard. “Burke Special: An Obituary.” *New Scientist* 55, no. 807 (August 3, 1972): 226–72.
- Four-Way. “Scientific Films in Britain.” *Documentary News Letter* 3, no. 8 (August 1942): 115–16.
- Haslett, Arthur Woods. *Unsolved Problems of Science*. London: G. Bell & Sons, 1935.
- Hawkins, Desmond. “Preface.” In *The BBC Naturalist*, edited by Desmond Hawkins, 7–8. London: Rathbone Books, 1957.
- Hogben, Lancelot. *Mathematics for the Million*. London: G. Allen & Unwin, 1936.
- . “Prolegomena to Political Arithmetic.” In *Political Arithmetic: A Symposium of Population Studies*, edited by Lancelot Hogben. Routledge, 2013.
- . *Science for the Citizen: A Self-Educator Based on the Social Background of Scientific Discovery*. London: George Allen and Unwin Ltd., 1938.
- . “The Foundation of Social Biology.” *Economica*, no. 31 (1931): 4–24.
- Mass Observation. *Puzzled People*. London: Victor Gollancz, 1947.
- Mumford, Lewis. *Technics and Civilization*. 7th ed. London: Routledge & Kegan Paul, 1934.
- Our Home Department Correspondent. “Wives Condemn Gaol Security Wing.” *The Times*, February 16, 1967. The Times Digital Archive.
- Silcock, Bryan, and Cal McCrystal. “Suspect Gas: 148 Cylinders.” *The Sunday Times*, September 11, 1966.
- Silvey, Robert. “The Intelligibility of Broadcast Talks.” *Public Opinion Quarterly* 15, no. 2 (January 1, 1951): 299–304.
- Singer, Aubrey. “Science Broadcasting.” In *BBC Lunch-Time Lectures: Series 4*. London: British Broadcasting Corporation, 1966.

Wade, David. "Backward Glances." *The Times*, January 5, 1974, sec. Arts and Entertainment. The Times Digital Archive.

Wells, G. P. "Lancelot Thomas Hogben. 9 December 1895-22 August 1975." *Biographical Memoirs of Fellows of the Royal Society* 24, no. 0 (November 1, 1978): 183–221.

Secondary Sources

Adeney, Martin. "David Wilson." *The Guardian*, September 19, 2000, sec. News.
<http://www.theguardian.com/news/2000/sep/19/guardianobituaries2>.

Agar, Jon. "What Happened in the Sixties?" *The British Journal for the History of Science* 41, no. 4 (December 2008): 567–600.

Anonymous. "Gerard Mansell." *The Telegraph*, December 27, 2010, sec. News.
<http://www.telegraph.co.uk/news/obituaries/culture-obituaries/tv-radio-obituaries/8227237/Gerard-Mansell.html>.

Anonymous. "In Pictures: The Reith Lectures." *BBC News*, December 2, 2014.
<http://www.bbc.co.uk/news/in-pictures-13647943>.

Anonymous. "John Reith - History of the BBC - Corporation Man." *BBC*, 2017.
<http://www.bbc.co.uk/historyofthebbc/research/culture/reith-6>.

Bailey, Michael. "Rethinking Public Service Broadcasting: The Historical Limits to Publicness." In *Media and Public Spheres*, edited by Richard Butsch, 96–108. London: Palgrave Macmillan UK, 2007.

Barkham, Patrick. "Oil Spills: Legacy of the Torrey Canyon." *The Guardian*, June 24, 2010, sec. Environment. <http://www.theguardian.com/environment/2010/jun/24/torrey-canyon-oil-spill-deepwater-bp>.

Bauer, Martin, Asdis Ragnarsdottir, Annadis Rudolfsdottir, and John Durant. "Science and Technology in the British Press, 1946-1990: A Systematic Content Analysis of the Press." London, UK: The Science Museum, 1995.

Bauer, Martin W., and Jane Gregory. "From Journalism to Corporate Communication in Post-War Britain." In *Journalism, Science and Society: Science Communication between News and Public Relations*, edited by Martin W. Bauer and Massimiano Bucchi, 33–52. Abingdon: Routledge, 2007.

- Boon, Timothy. *Films of Fact: A History of Science in Documentary Films and Television*. London: Wallflower Press, 2008.
- . “‘The Televising of Science Is a Process of Television’: Establishing Horizon, 1962–1967.” *The British Journal for the History of Science* 48, no. 1 (March 2015): 87–121.
- Boon, Timothy, and Jean-Baptiste Gouyon. “The Origins and Practice of Science on British Television.” In *The Routledge Companion to British Media History*. Routledge, 2014.
- Bowler, Peter J. *Science for All: The Popularization of Science in Early Twentieth-Century Britain*. Chicago: University of Chicago Press, 2009.
- Briggs, Asa. *Competition*. Vol. 5. The History of Broadcasting in the United Kingdom. Oxford; New York: Oxford University Press, 1995.
- . *Sound and Vision*. Vol. 4. The History of Broadcasting in the United Kingdom. Oxford: Oxford University Press, 1995.
- . *The War of Words*. Vol. 3. The History of Broadcasting in the United Kingdom. London: Oxford University Press, 1995.
- Bucchi, Massimiano, Brian Trench, M. Bucchi, and B. Trench. “Introduction.” In *Handbook of Public Communication of Science and Technology*, 1–3. London & New York: Routledge, 2008.
- Burns, Tom. *The BBC: Public Institution and Private World*. London: Macmillan, 1977.
- Carey, John. *The Intellectuals and the Masses: Pride and Prejudice among the Literary Intelligentsia, 1880–1939*. London; Boston: Faber and Faber Limited, 1992.
- Carpenter, Humphrey. *The Envy of the World: Fifty Years of the BBC Third Programme and Radio 3, 1946–1996*. London: Weidenfeld & Nicolson, 1996.
- Chignell, Hugh. *Key Concepts in Radio Studies*. London: SAGE Publications Ltd, 2009.
- . *Public Issue Radio: Talks, News and Current Affairs in the Twentieth Century*. Basingstoke: Palgrave Macmillan, 2011.
- Clark, Fiona, and Deborah L. Illman. “A Longitudinal Study of the New York Times Science Times Section.” *Science Communication* 27, no. 4 (June 1, 2006): 496–513.
- Cole, Rupert. “1972: The BBC’s Controversy and the Politics of Audience Participation.” *Public Understanding of Science* 26, no. 4 (February 1, 2017): 514–18.
- Crisell, Andrew. *An Introductory History of British Broadcasting*. London: Routledge, 1997.

- Crook, David. "School Broadcasting in the United Kingdom: An Exploratory History." *Journal of Educational Administration and History* 39, no. 3 (December 1, 2007): 217–26.
- Curran, James, and Jean Seaton. *Power Without Responsibility: The Press, Broadcasting, and New Media in Britain*. 6th ed. London; New York: Routledge, 2003.
- Davies, Gail. "Science, Observation and Entertainment: Competing Visions of Postwar British Natural History Television, 1946-1967." *Ecumene* 7, no. 4 (October 1, 2000): 432–60.
- Derksen, Maarten, and Tjardie Wierenga. "The History of 'Social Technology', 1898–1930." *History and Technology* 29, no. 4 (December 2013): 311–30.
- Desmarais, Ralph. "Promoting Science': The BBC, Scientists, and the British Public, 1930–1945." M.A. thesis, University of London, 2004.
- Desmarais, Ralph John. "Science, Scientific Intellectuals, and British Culture in the Early Atomic Age: A Case Study of George Orwell, Jacob Bronowski, P.M.S. Blackett and J.G. Crowther." PhD Thesis, Imperial College, London, 2010.
- Dornan, Christopher. "Some Problems in Conceptualizing the Issue of 'Science and the Media.'" *Critical Studies in Mass Communication* 7, no. 1 (March 1, 1990): 48–71.
- Drake, Deborah. *Prisons, Punishment and the Pursuit of Security*. Critical Criminological Perspectives. Houndmills, Basingstoke, Hampshire ; New York, NY: Palgrave Macmillan, 2012.
- Dunning, John. *On the Air: The Encyclopedia of Old-Time Radio*. Oxford University Press, USA, 1998.
- Farry, James. "'Far More to It than Appears on the Surface': an Historical Investigation of the Interface between Space Science and the British Mass Media." PhD Thesis, University of Manchester, 2011.
- Forgan, Sophie. "Festivals of Science and the Two Cultures: Science, Design and Display in the Festival of Britain, 1951." *The British Journal for the History of Science* 31, no. 2 (1998): 217–40.
- Gouyon, Jean-Baptiste. "The BBC Natural History Unit: Instituting Natural History Film-Making in Britain." *History of Science* 49, no. 4 (December 1, 2011): 425–51.
- Gregory, Jane. "Fred Hoyle and the Popularisation of Cosmology." PhD Thesis, Imperial College, London, 1998.
- . *Fred Hoyle's Universe*. Oxford: Oxford University Press, 2005.

- Gregory, Jane, and Steve Miller. *Science in Public: Communication, Culture, and Credibility*. Cambridge, Mass: Basic Books, 2000.
- Hendy, David. *Life on Air: A History of Radio Four*. Oxford; New York: Oxford University Press, 2007.
- Hogben, Lancelot Thomas, Adrian Hogben, and Anne Hogben. *Lancelot Hogben, Scientific Humanist: An Unauthorised Autobiography*. Woodbridge, Suffolk: Merlin Press, 1998.
- Hollinshead, Alisa Marion. "The Production and Reception of Discourses Concerning Religion in Fictional Broadcasting." PhD Thesis, University of Glasgow, 2002.
- Jones, Allan. "Clogging the Machinery: The BBC's Experiment in Science Coordination, 1949–1953." *Media History* 19, no. 4 (November 2013): 436–49.
- . "Elite Science and the BBC: A 1950s Contest of Ownership." *The British Journal for the History of Science* 47, no. 4 (December 2014): 701–23.
- . "Joe Trenaman's Investigation of BBC Listeners' Understanding of Science." Philadelphia, PA, USA, 2012.
- . "Mary Adams and the Producer's Role in Early BBC Science Broadcasts." *Public Understanding of Science* 21, no. 8 (November 2012): 968–83.
- Jones, Allan Clive. "Speaking of Science: BBC Science Broadcasting and Its Critics, 1923–64." Unpublished PhD dissertation, UCL, 2010.
- Karpf, Anne. *Doctoring the Media: The Reporting of Health and Medicine*. Routledge, 1988.
- Kearney, Martha. "Martha Kearney: Celebrating 50 Years of World At One." *Telegraph*, October 3, 2015, sec. Culture.
<http://www.telegraph.co.uk/culture/tvandradio/bbc/11906531/Martha-Kearney-celebrating-50-years-of-World-At-One.html>.
- Kirby, David. *Lab Coats in Hollywood: Science, Scientists, and Cinema*. Cambridge, Mass.: MIT Press, 2011.
- LaFollette, Marcel Chotkowski. *Making Science Our Own: Public Images of Science, 1910-1955*. Chicago: University of Chicago Press, 1990.
- . *Science on American Television: A History*. Chicago; London: The University of Chicago Press, 2013.
- . *Science on the Air: Popularizers and Personalities on Radio and Early Television*. Chicago, Ill. ; London: University of Chicago Press, 2008.

- LeMahieu, D. L. *A Culture for Democracy: Mass Communication and the Cultivated Mind in Britain between the Wars*. Oxford, New York: Oxford University Press, 1988.
- Lewenstein, Bruce V. "Science Books Since 1945." In *The Enduring Book: Print Culture in Postwar America*, edited by D.P. Nord, J.S. Rubin, and M. Schudson, 347–60. Chapel Hill: University of North Carolina Press, 2009.
- . "The Meaning of 'Public Understanding of Science' in the United States after World War II." *Public Understanding of Science* 1, no. 1 (January 1, 1992): 45–68.
- . "Was There Really a Popular Science 'Boom'?" *Science, Technology, & Human Values* 12, no. 2 (April 1, 1987): 29–41.
- Liebling, Alison. "High Security Prisons in England and Wales: Principles and Practice." In *Handbook on Prisons*, edited by Yvonne Jewkes, Ben Crewe, and Jamie Bennett, 2nd ed., 477–98. London & New York: Routledge, 2016.
- Luzón, María José. "Public Communication of Science in Blogs." *Written Communication* 30, no. 4 (June 19, 2013): 428–57.
- Macdonald, Sharon, ed. *The Politics of Display: Museums, Science, Culture*. London: Routledge, 1998.
- Marwick, Arthur. *The Sixties: Cultural Revolution in Britain, France, Italy, and the United States, c.1958-c.1974*. London: Bloomsbury Reader, 2012.
- Matthews, Douglas. "Obituary: John Hillaby." *The Independent*, October 21, 1996.
<http://www.independent.co.uk/news/people/obituary-john-hillaby-1359601.html>.
- Mellor, Felicity. "Between Fact and Fiction: Demarcating Science from Non-Science in Popular Physics Books." *Social Studies of Science* 33, no. 4 (2003): 509–38.
- Mellor, Felicity, Stephen Webster, and Alice R. Bell. "Content Analysis of the BBC's Science Coverage." London: Imperial College London, 2011.
- Nelkin, Dorothy. *Selling Science: How the Press Covers Science and Technology*. Revised ed. New York: W.H. Freeman and Company, 1995.
- Goodell, Rae. *The Visible Scientists*. 1st ed. Boston, Mass: Little Brown, 1977.
- Rensberger, Boyce. "Science Journalism: Too Close for Comfort." *Nature* 459, no. 7250 (June 25, 2009): 1033–1160.
- Scannell, Paddy, and David Cardiff. *A Social History of British Broadcasting. Vol. I (1922-1939): "Serving the Nation."* Oxford: Basil Blackwell, 1991.

- Schäfer, Mike S. "Taking Stock: A Meta-Analysis of Studies on the Media's Coverage of Science." *Public Understanding of Science* 21, no. 6 (December 1, 2010): 650–63.
- Seaton, Jean. "Journeys to Truth: The BBC as a Pragmatic Ethical Engineer at Home and Abroad." *Historical Journal of Film, Radio and Television* 28, no. 4 (October 2008): 441–51.
- Seymour-Ure, Colin. *The British Press and Broadcasting Since 1945*. 2nd ed. Oxford: Blackwell, 1996.
- Silverstone, Roger. *Framing Science: The Making of a BBC Documentary*. London: British Film Institute, 1985.
- . *Television and Everyday Life*. London; New York: Routledge, 2006.
- Sturges, Fiona. "Frankly Speaking, Review: Radio 4 Extra Unearths Landmark Interview Series." *The Independent*, March 19, 2015. <http://www.independent.co.uk/arts-entertainment/tv/reviews/frankly-speaking-review-radio-4-extra-unearths-landmark-interview-series-10117936.html>.
- Trench, Brian. "How the Internet Changed Science Journalism." In *Journalism, Science and Society: Science Communication between News and Public Relations*, edited by Martin W. Bauer and Massimiano Bucchi, 133–42. Abingdon: Routledge, 2007.
- Turney, Jon. "Popular Science Books." In *Handbook of Public Communication of Science and Technology*, edited by Massimiano Bucchi and Brian Trench, 5–14. Abingdon: Routledge, 2008.
- Weingart, Peter, Claudia Muhl, and Petra Pansegrau. "Of Power Maniacs and Unethical Geniuses: Science and Scientists in Fiction Film." *Public Understanding of Science* 12, no. 3 (July 1, 2003): 279–87.
- Werskey, Gary. *The Visible College*. London: Allen Lane, 1978.
- Williams, Andy, and Sadie Clifford. "Mapping the Field: A Political Economic Account of Specialist Science News Journalism in the UK National Media." Project Report. Cardiff University, 2008.
- Wright, Pearce. "Obituary: Gerald Leach." *The Guardian*, January 21, 2005, sec. Science. <http://www.theguardian.com/science/2005/jan/21/obituaries.pressandpublishing>.
- Yusaf, Shundana. *Broadcasting Buildings: Architecture on the Wireless, 1927-1945*. Cambridge, Massachusetts: The MIT Press, 2014.