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Interpreting Science

JG Crowther and the Making of Interwar British Culture

Oliver Hill-Andrews
Abstract

This thesis examines the place of science in interwar British culture, and challenges central narratives about the shape of interwar British science. Informed by histories of the nineteenth century that critique processes of professionalization and popularization, I argue that characteristics of nineteenth-century science persisted much longer than is commonly assumed. In particular, I show that the boundaries of the scientific community were still quite fluid, that interpreting science for a broad audience was crucial for the making of science (both in the public sphere and in the scientific community, at a time of specialization), and that there were attempts to overcome a supposed divide between the sciences and the arts (in cultural productions and personal relations).

These arguments are made through an examination of the life and work of J.G. Crowther (1899–1983). Crowther’s life has not yet received extended treatment from historians, but this neglect belies his contemporary importance. Drawing on his extensive archive (and those of his peers) and reviews, I advance the notion of Crowther as a ‘man in the middle’ — he was someone who mediated between practising scientists and the public and between practising scientists of different specializations, positioned himself at the centre of the two cultures, and often found himself in the middle ground politically. As such, he exemplifies the state of the pre-Big Science culture of interwar Britain.

Conceptually, I develop the term ‘interpreter’ to refer to Crowther’s role: this term overcomes many of the pitfalls of ‘popularizer’, and shows Crowther in an active role, shaping and re-shaping the meanings of science in the public sphere for his own political and professional ends. It is hoped that, by thinking in terms of ‘interpretation’, historians will be able to develop more sophisticated understandings of the place of science in twentieth century British culture.
Acknowledgements

Above all, I would like to thank my supervisor, Jim Endersby, for his advice, inspiration and encouragement in the research and writing of this thesis. Thanks also to Hester Barron, and to those who advised me on the state of Crowther scholarship, including Ralph Desmarais, Jane Gregory and Allan Jones. Melinda Baldwin and Boris Jardine kindly let me see their unpublished work. Of my friends, special mention must go to Ben Brown, Matt Crumpler, Luc Guillou, Elliot Gwynne and all the Sussex researchers (past and present). My family — Wendy, Steve and Matthew Hill-Andrews — have supported me throughout my education, in many ways. Finally, without my partner, Heather Macklyne, I’d never have completed this thesis.

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In 1936, one of Britain’s most prominent scientists, the Nobel prize-winner Sir Frederick Gowland Hopkins (1861–1947), announced the emergence of a ‘form of literature’ that he felt was ‘something new and of an importance which will steadily increase.’ Hopkins was not, he informed those who had gathered to hear his Birkbeck College Foundation Oration, ‘thinking of efforts meant merely to popularise science.’ The literature Hopkins had in mind was produced by ‘very able writers’ who synthesized and assessed ‘the most significant aspects of the progress in this or that branch of science’ and did so ‘with accuracy and literary skill.’ While many such books were ‘perhaps at present mostly written for the intelligent lay public’, and therefore counted as popularizations on one level, ‘the best of them are of real value to the specialist.’ That was their real significance, since ‘frequent exchanges across the frontiers of knowledge are essential for the symmetrical growth of science’. Hopkins therefore suggested ‘that every encouragement should be given to this form of literature’. At its highest standard, it could be produced ‘only by men with special gifts who are enabled to give all their time to it’, having first escaped ‘the exacting demands of personal teaching and research.’ However, ‘the world of what we may call official science’ was unlikely to recognize ‘those who render [science] this indirect service’ because ‘Honour in that world is won, for the most part, by original research work.’ But these ‘gifted individuals’ had in common with research scientists ‘an inborn sympathy with the nature and aims of science’, only differing in their ‘urge for literary expression rather than for experiment.’ Such people, who chose ‘to devote their lives to wide surveys of scientific progress and the interpretation of its significance for their colleagues who are immersed in specialised researches’, should not be neglected. As use of ‘colleagues’ suggests, Hopkins thought ‘that science should honour them as being among those who really advance it. In these
days of specialisation this particular from \textit{sic} of specialisation is surely justified.\textsuperscript{1}

By the mid-1930s, Hopkins was a grandee of the scientific world, and his opinions carried weight. The outline of his career is familiar, as it suggests that the late nineteenth and early twentieth centuries were a period of discipline formation and professionalization. Described as ‘the founder of modern biochemistry’ by one of his former colleagues, Hopkins was awarded the Nobel Prize for his demonstration of the existence of ‘accessory food factors’ (now known as vitamins), work that he had done around the turn of the century in which he proved that milk contained something not present in a purified synthetic diet (of carbohydrates, proteins, fats and salts) which enabled his rats to survive and grow. During the First World War, Hopkins continued — this time with the assistance of technicians — to investigate the role of vitamins in nutrition, a pressing concern during food shortages and rationing.\textsuperscript{2} When the war ended, Hopkins headed a growing biochemistry laboratory in Cambridge: in 1920, he had ten workers, by 1925 he had fifty-nine, and by the middle of the 1920s Hopkins and his colleagues were responsible for almost half of the papers that appeared in the \textit{Biochemical Journal}. Hopkins also established the first undergraduate biochemistry course in Britain.\textsuperscript{3} By 1936, when he addressed Birkbeck College, Hopkins had served as President of the Royal Society, and could add a knighthood and the Order of Merit to his list of honours.\textsuperscript{4}

Many similar stories could be told which show that by the beginning of the twentieth century, most scientists were paid professionals who worked in laboratories, whether in a university, a government research facility, or in industry. New recruits enlisted to the ranks of science were probably from middle-class backgrounds, who had been exposed to science in their school years

\begin{itemize}
\item[4] Needham, ‘Sir Frederick’, 129.
\end{itemize}
thanks to an education system that devoted increasing attention to science, both pure and applied. Laboratory work was well-funded by governments, who expected to benefit practically from research. While the First World War did not create an appreciation of the importance of science and technology overnight, it hastened trends that had started round 1900.\(^5\) Increasingly, scientists worked cooperatively, and new disciplines (like biochemistry) and specializations formed, with new journals and societies that excluded those without a formal training in science. Science could only be understood by nonspecialists (if at all) if it was rendered in simplified language, which inevitably masked the complexities of the knowledge. Specialization bred a sort of cultural tunnel vision on behalf of scientists. The nineteenth-century principle that men of science were cultural leaders who attempted to shape public opinion largely declined as they receded into their laboratories from arenas of public discussion.

This portrayal of inter-war science is not unusual, and some of it is undeniably true. However, it is perhaps too familiar and makes the interwar period seem a lot like the present, by placing the development of science within overarching — seemingly inevitable — processes. The story of professionalization, in particular, in which a narrowly defined scientific community is presumed to have emerged by the first decades of the twentieth century, has influenced historical perceptions of science in public culture. According to this story, a formalized system of science training had developed to provide expert scientists to fill the multiplying sub-disciplines and specializations within science. Each branch of science also had its own journals and esoteric terminology. In this situation, ‘popularization’ appears as an adjunct to the creation of knowledge, a supplement to research itself, and therefore as less interesting than what occurred in laboratories. It is therefore surprising to see Hopkins — who is seen as a force for the professionalization of biochemistry — advocating literary endeavours, and recommending that exposition of science be accorded a status as high as that of ‘official science’. In fact, Hopkins did not consider a degree to be essential for scientific publication,

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and he described himself as an amateur, rather than a professional, scientist. The characteristics of nineteenth-century science persisted much longer than the standard story of professionalization would have us assume: it was not until the Second World War that science took on many of the characteristics that we now associate with it.

During his Birkbeck oration, Hopkins had particular writers in mind, and in this dissertation, I focus on one of them: James Gerald (‘Jimmy’) Crowther (1899–1983), whose career illuminates these important historical questions (fig. 1). By using Crowther’s life and work — with a focus on the interwar years — as a ‘cultural tracer’, it is possible to reassess central assumptions about the place of science in culture that govern current understandings of the period — namely, the professionalization of science, the popularization of science, and the relations between science and art (broadly construed). Crowther’s life is illuminating precisely because he crossed many of the boundaries that are associated with these processes.

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6 Needham, ‘Sir Frederick’, 152, 151.
7 For broader continuities between the late nineteenth and early twentieth centuries, see Jose Harris, Private Lives, Public Spirit: Britain 1870–1914 (London, 1994), 251–256.
8 J.G. Crowther, Fifty Years With Science (London, 1970), 68.
Born in Halifax on 26th September 1899, Crowther came from a middle-class family. His father, another James (1866–1947), was headteacher of Halifax Technical School (later Halifax Municipal Technical College); his mother, Alice, taught music. Their first child, Ethel Dorothy (known as Dodo; 1893–1982) studied at Bradford Girls’ Grammar School and, during the First World War, at Newnham College, Cambridge. Her subject was English, while J.G. developed an interest in mathematics at Bradford Grammar School. He also became friends with Ralph Fox (1900–1936), who extended Crowther’s ‘independent view of fathers & headmasters... to social & political authorities & affairs.’
Conversations with Fox, which Crowther remembered over thirty years later, prompted Crowther to read socialist literature.¹¹

Meanwhile, Crowther had been awarded a scholarship to study mathematics and physics at Trinity College, Cambridge. Because of the First World War, however, he could not take up his place immediately, so he worked on anti-aircraft guns at Portsmouth with a team headed by the physiologist A.V. Hill (1886–1977). Soon after beginning his studies at Trinity College in 1919, Crowther suffered a nervous breakdown and dropped out. A peripatetic period as a temporary teacher followed. Though Crowther tended to teach maths, the student whom he became closest to was the working-class A.L. Rowse (1903–1997), who went on to become an Elizabethan historian and Labour Parliamentary Candidate. Crowther became more involved in left-wing politics, principally through the Plebs’ League, an independent working-class education association, and flirted with the Communist, Labour and Independent Labour Parties. As shown in chapter one, this close connection between education and politics influenced Crowther’s reasons for writing about science for non-specialist audiences.

In 1924, Crowther married a school matron, Dora Amy Royle de Bude (b. 1889/90) and, in order to support Dora and her six-year-old daughter Pauline, got a job as a travelling technical books salesman for Oxford University Press. In the same year, he began to write articles about science, and thought more about educating laypeople about science. As a result, he attempted to commission new books for the OUP (rather than devoting his time to selling existing ones) which led to criticism from his boss. Recognising the reach of the BBC, Crowther suggested both a ‘science bureau’ which would put its science broadcasting on a more systematic footing, and a ‘science page’ for the Radio Times. Neither came to fruition, and in subsequent years he devoted his efforts to publishing with the Manchester Guardian, the Week-End Review, the Left Review, and other periodicals. Crowther’s efforts were rewarded at the end of 1928 when he was made ‘Scientific Correspondent’ of the Manchester Guardian by the editor, C.P.

¹¹ J.G. Crowther Archive, University of Sussex Special Collections (henceforth SxMs29), SxMs29/9/12/1, ‘Ralph Fox’, 27.4.50, 21, 15–16.
Scott, apparently his ‘last innovation’ at the paper; Crowther held this position until after World War II.  

Also in 1928, a number of Crowther’s articles were republished as a book, *Science for You*, which began a series of the same name. In subsequent years, he visited Russia (he had vacationed there in summer 1929), Germany, Copenhagen, Paris and America and wrote about scientific and social developments there. As a result of his teaching experience and knowledge of British educational institutes, Crowther also advised the Soviet Supreme Economic Council on technical education, though as he noted in *Industry and Education in Soviet Russia* (1932), he was embarrassed to discover that Russia could learn little from Britain. Like many contemporaries, Crowther was impressed by Russia’s imperviousness to economic depression and its apparent support of scientific research. His admiration for the Soviet Union found an outlet in the Society for Cultural Relations with the USSR, where — along with the archaeologist V. Gordon Childe (1892–1957) and the physicist P.M.S. Blackett (1897–1974) — he helped set up the science section and organized tours to Russia. Crowther also sat on the Executive Committee for a number of years, and lectured regularly to its members. In a trip to the USSR in 1932, Crowther met his second wife, Franziska Zarniko, an aspiring German filmmaker who lived with the chemist Martin Ruhemann (1903–1994) and his wife Barbara as a nanny. Franziska and Crowther shared a commitment to socialism, and she taught Crowther German, and made significant contributions to his books, for example by proof-reading and preparing the indexes.  

By the mid to late 1930s, especially after the publication of *British Scientists of the Nineteenth Century* (1935) and *American Men of Science* (1937), contemporaries regarded Crowther as one of the more prominent advocates of the social relations of science. Such topics were discussed at the ‘Tots and Quots’,

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13 In 1951, the Security Services reported that Franziska was a member of the Holborn Branch of the Communist Party, though it is not clear when she joined: The National Archives (henceforth TNA) KV2/3343, Special Branch Report dated 18.10.51, 5.
a dining group that met regularly in the early and late 1930s. Crowther’s work
was attacked by the chemist Michael Polanyi (1891–1976) and especially by
the economist F.A. Hayek (1899–1992), both of whom believed that excessive
planning led to tyranny and that science was motivated chiefly by a disinterested
search for truth.

Upon the outbreak of the Second World War, Crowther was not initially
involved in the war effort because, unlike the crystallographer J.D. Bernal (1901–
1971) or the zoologist Solly Zuckerman (1904–1993), it was unclear how his
work could help. So, before his appointment as director of the Science
Department of the British Council, Crowther continued to exert a profound and
often invisible influence on science in public culture in Britain and beyond. He
reviewed books and acted as informal consultant for publishers, notably for
Penguin books. Many of his own books were republished under the Pelican
imprint which brought his work to a much wider audience. After the publication
of the Penguin special Science and War (1940), to which Crowther and other
members of the Tots and Quots contributed, Crowther was involved in a project
to create a ‘proper propaganda for science’.

After the Second World War, Crowther involved himself with the campaign
for nuclear disarmament. He acted as chairman of the British Peace Committee
and in 1949 found himself mentioned in newspaper articles when the USA
revoked his visa to attend the Cultural and Scientific Conference for World Peace
in New York. In the same year, Crowther’s name appeared — along with that of
his friends, Bernal, Blackett and Gordon Childe — on George Orwell’s list of
writers who could not be trusted to write anti-communist propaganda. Crowther
continued to produce a steady stream of books, including Science in

14 The name was ‘an abbreviation and inversion of Terence’s phrase Quot homines, tot
sententiae (“so many men, so many opinions”): Ralph J. Desmarais, ‘Tots and Quots (act.
15 See, for example, The Times, 23.3.49, 3. Along with ‘Dr.’ Crowther, J.D. Bernal, the novelist
Louis Golding, and the actress Patricia Burke also had their visas revoked. Olaf Stapledon’s
was temporarily revoked. For Crowther’s involvement in the British Peace Committee, see
Ralph John Desmarais, ‘Science, Scientific Intellectuals and British Culture in The Early
Atomic Age, 1945–1956: A Case Study of George Orwell, Jacob Bronowski, J.G. Crowther
and P.M.S. Blackett’ (Imperial College London Ph.D., 2010), chap. 5.
16 Guardian, 21.6.03, B5. Orwell designated both Blackett and Crowther ‘scientific
popularisers’, and commented on Crowther: ‘Querly. whether open C.P. member’.
Liberated Europe (1949), British Scientists of the Twentieth Century (1952), Six Great Inventors (1954), Science Unfolds the Future (1955), Founders of British Science (1960), Scientists of the Industrial Revolution (1962), Statesmen of Science (1965), Scientific Types (1968), A Short History of Science (1969), and in 1970 an autobiography entitled Fifty Years With Science. He retired to Flamborough Head in Yorkshire and died there in 1983; shortly afterwards, Franziska probably committed suicide by jumping from the promontory.

Crowther’s career was therefore diverse and he was an outsider who traversed boundaries, in many senses. Educationally, though he attended Cambridge, he dropped out after one term and lacked the privileges that an Oxbridge degree brought; socially, he came from the north of England and ‘was aware of social conflicts in industrial society from an early age’; politically, he liked to consider himself ‘a traitor in the ranks of the bourgeoisie’; financially, his position was mostly precarious. His marriages were also unorthodox: Dora was a decade older than Crowther and already had a daughter, while Franziska was German. All of these factors made his position within the intellectual elite somewhat unusual: as he said in his autobiography, for fifty years he had been ‘with science, though not in it’. In this thesis, I develop the notion of Crowther as a man in the middle — he was someone who mediated between practising scientists and the public and between practising scientists of different specializations, positioned himself at the centre of the two cultures, and often found himself in the middle-ground politically. As such, he exemplifies the state of the pre-Big Science culture of inter-war Britain. His liminal position gave him a unique perspective from

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17 This list is not exhaustive. Crowther’s autobiography is used too readily by historians, particularly considering its Cold War context and Crowther’s attempts to achieve ‘composure’. See, for example, Mary Jo Nye, Michael Polanyi and His Generation: Origins of the Social Construction of Science (Chicago, 2011); C.A.J. Chilvers, ‘The Dilemmas of Seditious Men: The Crowther-Hessen Correspondence in the 1930s’, The British Journal for the History of Science, 36 (2003), passim.
18 SxMs29/12/41/9, autobiography draft, 25.7.68, 1 for comment on the north. The traitor remark comes from Crowther’s notes and, even if he did not intend the phrase to apply to himself, is a fair description of his stance: SxMs29/12/39/3. For the social prestige and exclusivity of an Oxbridge education, see Ross McKibbin, Classes and Cultures: England 1918-1951 (Oxford, 1998), 248-250.
19 Crowther, Fifty, 7.
which to view science and society, and contemporaries remarked on his (often
penetrating) wide-eyed observations of the world. Terry Eagleton suggests that
to be inside and outside a position at the same time — to occupy a territory
while loitering sceptically on the boundary — is often where the most
intensely creative ideas stem from. It is a resourceful place to be, if not always
a painless one.  

Crowther’s life and career gives substance to this assertion, and some — like
Hopkins — thought that Crowther’s ‘special gifts’ should be duly
acknowledged.  

The interwar period was the formative part of Crowther’s life, when, as I
suggest in this thesis, he invented the new type of literature that Hopkins spoke
of. He did so against a backdrop of social, political, economic and cultural
change that spanned the 1920s and 1930s. The legacy of WWI, which begins the
period, was mixed. Feelings of loss, reinforced by the publication of war poets in
the 1930s, were not the sole memories of the war: Britain had won, and emerged
with an expanded empire. At the same time, the postwar period saw international
instability, including Red Revolutions and the danger of colonial nationalisms.
The 1920s also witnessed industrial unrest, culminating in the 1926 General
Strike, but the 1930s saw less strife. Similarly, if memories of the Great
Depression tend to dominate perceptions of the period, outside of the years
1929–1932 there were signs of economic growth, and recovery by the mid-
1930s. As a result many, aside from the overwhelming exception of those in the
traditional industries, experienced rising living standards and greater
opportunities (particularly for women). Newer industries, notably electricity,
expanded massively, with use quadrupling in fourteen years. New companies,

\footnote{20 Terry Eagleton, After Theory (London, 2003), 40; Gary Werskey makes a similar point
about Bernal: Gary Werskey, ‘The Visible College Revisited: Second Opinions on the Red
Scientists of the 1930s’, Minerva, 45 (2007), 313.}

\footnote{21 For a discussion of disciplinary outsiders, see Oren Solomon Harman and Michael R.
Dietrich (eds.), Outsider Scientists: Routes to Innovation in Biology (Chicago, 2013).}

\footnote{22 Laura Beers and Geraint Thomas (eds.), Brave New World: Imperial and Democratic
Nation-Building in Britain Between the Wars (London, 2011), 24, 3; John Stevenson and
Chris Cook, The Slump: Britain in the Great Depression (Harlow, 2010), 16–39.}

\footnote{23 Martin Pugh, We Danced All Night: A Social History of Britain Between the Wars (London,
2008).}

\footnote{24 Stevenson and Cook, Slump, 18.}
such as Imperial Chemical Industries, were founded, who supplied funding for a
great deal of the scientific research that occurred in the period (along with the
state, as we have seen).\textsuperscript{25} Scientists could plausibly claim that they were living in a
scientific age. However, these more optimistic developments were arguably
overshadowed by the impression of morbidity and despair, of a failing capitalism
and democracy, voiced by many intellectuals.\textsuperscript{26} This negative portrayal of the
interwar period has predominated, but there were many contradictory trends at
work, which were expressed in surprising and unexpected ways by contemporaries.

What marked the whole of the interwar period was an attempt — by
politicians, the state and civil society more widely — to shape post-war Britain.\textsuperscript{27}
Of especial relevance to this thesis is the relation between elites and the public in
a newly democratic age. The 1918 Representation of the People Act enfranchised
around 14 million people, providing more of the population, including working-
class men and some women, with a voice in national politics. Parties and
politicians worried about how to deal with this democratic nation, particularly in
the face of rising powers such as Germany and the USA, and worked hard to
attract the electorate to their vision of Britain. The Conservative party demonized
the unionized working classes in order to define an anti-Socialist position that
embraced the middle classes and the non-unionized working classes; meanwhile,
Labour under Ramsay MacDonald attempted to appeal to all workers, whether
they used their hands or brains, and glossed over the distinction between ‘the
people’ and ‘the workers’.\textsuperscript{28} At the same time, all three parties sought to refashion
an intense, bullish Edwardian public to be more reserved and contemplative.\textsuperscript{29}

\begin{itemize}
\item[\textsuperscript{25}] David Edgerton and Sally Horrocks, ‘British Industrial Research and Development Before
\item[\textsuperscript{26}] Richard Overy, \textit{The Morbid Age: Britain and the Crisis of Civilisation, 1919–1939}
(London, 2009).
\item[\textsuperscript{27}] See especially Beers and Thomas, \textit{Brave}.
\item[\textsuperscript{28}] Beers and Thomas, \textit{Brave}, 8–9; Kevin Morgan, \textit{Labour Legends and Russian Gold} (London,
2006), 143–44; Jon Lawrence, ‘Labour and the Politics of Class, 1900-1940’, in David
Feldman and Jon Lawrence (eds.), \textit{Structures and Transformations in Modern British
History} (Cambridge, 2011); Labour spoke in terms of the nation: Laura Beers, \textit{Your Britain:
\item[\textsuperscript{29}] Jon Lawrence, ‘The Transformation of British Public Politics after the First World War’,
\end{itemize}
I argue, Crowther and his peers also represented an engaged response to the democratic public. They contributed to debates about how to reframe the democratic nation, by attempting to create a scientifically inspired active citizenship. Lancelot Hogben, for example, wrote in *Science for the Citizen* that ‘The new social contract demands a new orientation of educational values and new qualifications for civic responsibility.’ The resulting citizens, armed with the knowledge appropriate for a scientific age, would be immersed in the scientific method and spirit, and thus able to see through the irrationalities of capitalist society.

Though, as we shall see in chapter 1, Crowther put some hope in the education of children, and despite the raising of the school leaving age to fourteen in 1918, these citizens were to be scientifically informed as adults. The mass media offered unprecedented opportunities: a century after the steam printing revolution, communications were undergoing equally significant changes. The cinema, the expansion of print and the creation of the BBC all conspired to fashion a diverse national culture, influenced by peculiarities of class, generation and location. This was no democratization of culture, if by that is meant a broadly distributed body of opinion and works, but more and more people did feel empowered to take part in cultural pursuits. Since literacy increased to roughly 80 per cent in the period, authors could aspire to reach 20 million readers. Newspapers and magazines were most popular: between 1918 and 1939, daily newspaper circulation doubled, and publishers tried to appeal to

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34 For this debate, see LeMahieu, *Culture;* Christopher Hilliard, *To Exercise Our Talents: The Democratization of Writing in Britain* (Cambridge, 2006), 6.
female readers. But there was also innovation in book publishing: Allen Lane’s Penguin Books, though not the first paperbacks, successfully exploited a demand for affordable reprints. By the end of the 1930s, the majority could also listen to the BBC, as three-quarters of households had a radio set. The cinema was also increasingly popular, and at the outbreak of World War II almost half of the British population — predominantly young people, women and the working classes — attended each week. This mass media provided opportunities to shape attitudes towards science. More broadly, the progressive views espoused by Crowther and the other protagonists in this dissertation were part of a growth of left-wing cultural forms in the period — from the Left Book Club to the reinvented, populist Daily Mirror — which, it has been argued, contributed to the making of the Labour Party and its success in 1945.

Interpreting Science in the Twentieth Century

A central argument of this dissertation is that Crowther was influential in shaping the public culture of science in the interwar years, but what exactly was Crowther? In 1931, Hopkins wrote to Crowther having read his latest book: ‘science has at last found an adequate interpreter for the general public. You can “put things across”’. In this thesis, I will refer to Crowther and his contemporaries as ‘interpreters of science’. This term has the benefit of being an actors’ category, and it also successfully overcomes some of the problems associated with alternative descriptors of Crowther’s role, which are unsuitable or anachronistic. Usually, he is described as a science journalist, science writer, or scientific intellectual. Such terms, however, fail to capture the versatile nature of

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36 Adrian Bingham, ‘Representing the People? The Daily Mirror, Class and Political Culture in Inter-War Britain’, in Beers and Thomas, Brave, 109.
38 Beers and Thomas, Brave, 18.
39 Beers, Your Britain, 166–167.
40 SxMs29/12/4/3, Hopkins to Crowther, 24.5.31.
41 This term is developed by Jim Endersby, ‘Mutant Utopias: Evening Primroses and Imagined Futures in Early Twentieth-Century America’, Isis, 104 (2013), 477. It is also used in passing in Lightman, Victorian Popularizers, ix but is not developed there.
Crowther’s career, which was created in the face of unforeseen circumstances: he only arrived at his writing career after struggling as an educationalist and travelling book salesman. ‘Science journalist’ in particular implies that Crowther belonged to a clear profession, which was in fact in the process of being created: Crowther, as we shall see, set forth a distinctive vision for the role, which differed considerably from what we now mean by the term (chapter 3). Crowther did not see himself as a science writer, nor — as shown in chapter 1 — was he particularly keen on intellectuals. Labelling Crowther a ‘faithful publicist’ for the red scientists J.D. Bernal, J.B.S. Haldane, Lancelot Hogben, Hyman Levy and Joseph Needham is also problematic. Whilst it rightly suggests a shared, broad belief in the social implications of science, and the ability of science to salve the social crises of the 1920s and 1930s, it casts Crowther in too passive a role. Indeed, Crowther is generally seen as a popularizer of scientists’ discoveries, theories, and philosophies of science.

This tendency to portray Crowther and his work as secondary in importance to that of practising scientists can be considered a symptom of the so-called diffusionist interpretation of popularization, in which esoteric knowledge produced by practising scientists trickles downwards, through writers with little scientific training to the nonspecialist public. Historians have shown how misleading this framework is, especially when applied to the nineteenth century. It assumes the existence of two stable cultures — elite and popular — with the latter being more passive than the former. However, such categories were vague in the Victorian period: a key issue was the difficulty of deciding who was in the elite and who was in the public. In this situation, a wide range of people could be involved in science and contribute to the making of scientific knowledge.

42 Crowther, Fifty, 48.
44 For example, Chilvers, ‘Dilemmas’, 420.
Women and the working classes, for example, engaged in science, contributed to knowledge, and actively shaped the meanings of science. This interest was reflected in the various sites in which the public encountered science, such as in lectures, exhibitions, pubs and coffee houses, museums, zoos, fairs, centenaries and so on.\(^4^7\) Science in print was similarly diverse, and could be read about in books, newspapers, magazines, journals, textbooks, children’s books and encyclopaedias.\(^4^8\) Writing, rather than being peripheral, was an essential part of the scientific enterprise, and geological books appealed to practitioners and wider publics alike.\(^4^9\) Many of those who wrote for non-specialist audiences were non-practitioners, and these middle-class writers and journalists had their own agendas that often did not mesh with those of the scientific naturalists. Though Thomas Henry Huxley and others attempted to promote their ideology — that of explaining phenomena in terms of causes that could be observed in nature and in accordance with the theory of evolution, the conservation of energy, and the atomic theory of matter — in newly-founded journals such as *Nature* and books in the International Scientific Series, their dominance was challenged by writers who interpreted science within a religious framework.\(^5^0\)

We lack parallel work on the twentieth century, largely because it is supposed that professionalization had brought more rigid divisions between elite and popular, professional and amateur.\(^5^1\) Yet professionalization was a haphazard, by no means inevitable, process and it is not helpful to see the development of


\(^5^0\) Lightman, *Victorian Popularizers*, 496.

\(^5^1\) See, for example, Peter J. Bowler, *Science for All: The Popularization of Science in Early Twentieth-Century Britain* (Chicago, 2009), introduction.
intellectual life between the nineteenth and twentieth centuries in these terms.\textsuperscript{52} Making a living from science was not the main determinant of belonging to the scientific community in the nineteenth century; moral and intellectual qualities were more important.\textsuperscript{53} Even by the late 1800s, men of science did not describe themselves as professionals, because the term conflicted with gentility and respectability.\textsuperscript{54} Similar concerns persisted into the twentieth century: debate continued into the 1920s over whether scientific practitioners should be called ‘men of science’ or ‘scientists’; the latter word was criticized for being too inclusive and slovenly.\textsuperscript{55} As late as 1929, someone could ask with apparently only slight jocularity for a definition of a ‘scientific worker’: ‘Please, may I have a definition which will enable me to distinguish a scientific from an unscientific worker, and (since work is the antithesis of play) from a scientific player?’\textsuperscript{56} Indeed, the qualifications needed to be a man of science had arguably become more strict by the twentieth century, thanks in part to promotion of science education in the nineteenth century. Training in Huxley’s Normal School of Science (later the Royal College of Science) and similar institutions marked one out as having the right to speak about science.\textsuperscript{57} However, men of science still needed to police the (still fluid) boundaries, and one way of doing so was to appeal to direct experience of laboratory work.\textsuperscript{58} For example, J.B.S. Haldane questioned George Bernard Shaw’s status as a man of science on the basis that he ‘had never performed any laboratory experiments’; H.G. Wells’s position was more ambiguous — ‘after a long and painful hesitation’, Haldane thought Wells

\textsuperscript{56} \textit{The Scientific Worker}, April 1929, 39.
\textsuperscript{58} Baldwin, \textit{Making Nature}, chap. 3.
‘had worked in a laboratory at the School of Mines or somewhere; and therefore he wouldn’t like to say.’ Lancelot Hogben’s reputation also suffered, as we shall see, when he abandoned laboratory research to take up the Chair of Social Biology at the London School of Economics, and in defending his scientific standing, he appealed to his patient research and ‘first hand’ knowledge of the subject, in contrast to those economists who dabbled (from his perspective) in the subject. The latter irritated Hogben, as would — he wrote to Michael Polanyi — ‘a half baked essay from the Christian Science Monitor about your research in physics written by someone who’d never been in a physical laboratory.’

Experience of scientific research, then, was necessary to claim the authority to represent science.

However, Hopkins’s plea for ‘literary expression’ to be an acceptable substitute for original research work suggests a willingness to broaden the criteria of those who belonged to the scientific community, and that scientific practitioners felt the need to police the boundaries hints at uncertainty regarding who should be counted an expert. As we shall see in later chapters, the position of different activities within a scientific career (such as research, writing for a nonspecialist audience, politics, education, and so on) were not at all settled by the interwar period: in other words, there were a wide range of possible scientific identities in the twentieth century. A comparison of Crowther with the editor of *Nature*, Richard Gregory (1864–1952), is illuminating, not least because the historian of science Charles Singer hoped that Crowther — ‘a most able, interesting & charming fellow’ — would one day succeed Gregory as editor of *Nature*, which implies that they had qualities in common. As Melinda Baldwin has shown, Gregory overcame his lack of research experience and lack of FRS to

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60 Michael Polanyi Papers, University of Chicago (henceforth pp), Box 4, Hogben to Polanyi, 30.11.39.
61 pp, Box 4, Hogben to Polanyi, 8.12.39.
become editor of *Nature* in 1919 by maintaining a constant presence in the scientific world; promoting the claims of science; and claiming to be disinterested because he was not a partisan of a particular sub-discipline or theory. In 1933, Gregory was elected FRS under special regulation, and was thus able to successfully overcome his lack of experimental research.\(^6\) Crowther was similarly visible in the scientific world, whether at meetings of the British Association of the Advancement for Science (BAAS), or on his travels throughout Britain on behalf of Oxford University Press or the *Manchester Guardian*. He successfully formed friendships with scientists, and cultivated the genteel codes of conduct and behaviour that lived on into the twentieth century.\(^5\) Crowther also gained a reputation for responsibly expounding science. Eventually, as Hopkins’s comments make clear, a non-practitioner like Crowther could be regarded as an expert and a ‘colleague’ of scientists: someone who could make a genuine contribution to scientific knowledge.

Crowther was able to gain this reputation due to overspecialization — a leitmotif of this thesis. Of course, as a process specialization was an imagined reality, and worries about its consequences predated the twentieth century, but it was of particular concern in the interwar period.\(^6\) It also helped to maintain the blurriness of the lay/expert division. In public, expertise could be established in the literary marketplace, as the general public did not necessarily make distinctions founded on training and laboratory experience; and, in the case of Crowther’s anonymous *Manchester Guardian* articles, readers could not make such distinctions.\(^5\) Crucially, however, this was also the case for specialists, who outside their own particular subject found it hard to judge who was best qualified to assess the validity of knowledge claims. This was notably true of newsworthy topics, which dealt with new subjects or sub-disciplines. For example, Hugo de

\(^5\) On these gentlemanly codes, see Philip Chaston, ‘Gentlemanly Professionals Within the Civil Service: Scientists as Insiders During the Interwar Period’ (University of Kent at Canterbury Ph.D., 1997); Marcus Collins, ‘The Fall of the English Gentleman: The National Character in Decline, c.1918–1970’, *Historical Research*, 75 (2002) argues that gentlemanly values had a longer life than ‘declinist’ analyses would suggest.
Vries’s mutation theory was discussed and assessed in nonspecialist publications because that was the only site in which debate could occur (in the absence of specialist journals). Even where specialist journals did exist, they were becoming ever more indecipherable, even to scientific practitioners within different specialisms. So, both men of science and the public were sure to read about new theories and discoveries in general publications. Reading outside their specialism was not solely a matter of idle curiosity on the part of scientific practitioners. A perception existed, as Hogben said in 1935, that

All the old landmarks of naturalistic studies are disappearing. The biologist who is a taxonomist must needs be a geologist. If he is a geneticist he must be something of a mathematician. If he is a physiologist he may be making fundamental contributions to physical chemistry. Physicists are turning chemists, and chemists find themselves wandering into biophysics.

Practitioners could not afford to neglect progress in other specialisms if they were likely to encroach on their own discipline. Crowther’s career was a symptom of this situation, and he attempted to make general surveys of scientific knowledge a specialism in itself — he attacked practising scientists who entered his territory and wrote for a non-specialist audience as black-legs (because they already had a salary, they could demand a lower price for articles). ‘In these days of specialisation’, Hopkins agreed, ‘this particular from [sic] of specialisation’, which would help the ‘symmetrical growth of science… is surely justified.’ Throughout the following chapters, we will see that many practising scientists read Crowther and some assumed that he was a scientist, calling him Dr. or Professor.

As an analytical category, interpreter captures this continuing fluidity that existed in the relationship between specialists and non-specialists, whilst emphasizing that to interpret was an active process. The term makes no assumptions about an individual’s disciplinary background or occupation.

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68 Endersby, ‘Mutant’.  
69 Lancelot Hogben, Dangerous Thoughts (London, 1939), 117–118. In 1927, Julian Huxley said that ‘the progress of biology in Great Britain is being retarded by the failure of specialists in its various branches to appreciate the bearings of work done in other fields than their own’: Nature, 30.4.27, 639.  
70 SxMs29/13/4/3, notes on ‘Science in the Press’.  
71 Take, for example, the biochemist Hans Krebs’s reminiscence: both Bernal and Crowther, he wrote, ‘had originally been Cambridge scientists.’ Hans Krebs, Reminiscences and Reflections (Oxford, 1981), 90.
Instead, it describes what they did: interpret science for many audiences. Hence, practising scientists could be interpreters, as could those who derived their main source of income from other means. Audiences did not necessarily distinguish between these different types of ‘interpreter’ and all had a role to play in making public culture and in forming meanings of science amongst nonspecialists (including scientists). It is this blurriness that interpreter highlights. Furthermore, in making knowledge move, interpreters did not merely duplicate it; knowledge was transformed in the process of interpretation. Like the linguistic interpreter, interpreters of science translated knowledge from a specialized (sometimes mathematical) language into a more general idiom that could be understood by nonspecialists, and their context and views affected their interpretive frame. Interpreters had political and professional agendas, and Crowther was no exception. Indeed, his career — his theorizing of scientific journalism and later philosophic journalism — is presented here as in part an attempt to define the ‘interpreter’ more concretely, as a specialism in itself.

‘Interpreter of science’ also raises the question of readership, and how interpretations were made convincing to audiences. A deficiency of the current literature on twentieth century popular science is its lack of attention to the content of works. It is, however, crucial to pay attention to what was said in work for a non-specialist audience, and how it was said. Historians of science have turned to the concept of genre — changing categories of literature that provide comfort to readers due to the reappearance of familiar elements — as a way of overcoming the assumptions embedded in the concept of popular science. Indeed, contemporaries realized that ‘popular science’ tended to conceal

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72 Endersby, ‘Mutant’, 477.
75 As Melanie Keene points out, Bowler is not particularly concerned with the content of the works he studies, and *Science for All* ends up resembling a (admittedly useful) catalogue: Melanie Keene, ‘Review of Science for All: The Popularization of Science in Early Twentieth-Century Britain by Peter J. Bowler’, *Centaurus*, 52 (2010).
more than it revealed. ‘Books on “popular science,” like novels,’ J.W.N. Sullivan wrote in 1934, ‘exist on very different levels.’ The binary distinction between ‘technical science and popular science’ was no longer sufficient: Niels Bohr’s essays ‘could be popular only amongst scientific specialists’; Ritchie Calder’s were ‘truly popular’; and Crowther’s *Progress of Science* was ‘Intermediate between these two levels’. Rather than pigeonholing a piece of work as ‘a popular cosmological pamphlet’ or a ‘specialist paper’ (for example), labels that prejudge an audience, it is more fruitful to consider what conventions a piece of work drew upon. How authors and publishers utilized, subverted, and transformed the wide spectrum of available genres shows how they aimed to appeal to readers (and which ones), and perhaps reshape their expectations. The insights of book historians, who consider the importance of the materiality of printed matter, is also crucial: size, binding, paper quality, and typeface, amongst other things, all suggested what customs a work drew on. The genre(s) of Crowther’s work is of particular concern in chapters three and four: Crowther believed that he was doing something new, and this required original packaging and the invention of new genres. He therefore experimented with conventions common to novels, short stories, biographies, epics and even the Bible. Crowther’s archive, which includes reviews and correspondence from readers, is a rich resource for understanding how people interpreted his works, and who was reading them — from practising scientists to miners. Only by paying due attention to contemporary reaction to Crowther and his works can we attain a better understanding of their historical significance. Focusing on genre above all keeps us aware that writing, publication and reading was not performed in a vacuum, but was embedded in the context of a wider cultural conversation that embraced subjects other than science.

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77 *The Observer*, 30.12.34.
Rethinking Interwar Culture and Politics

Crowther’s career not only contributes to a rethinking of the professionalization and popularization of science in the early twentieth century; it also leads to a revised characterization of intellectual life in the period. Ralph Desmarais’s work, on scientific intellectuals in the early Cold-War era, depicts a politically diverse and culturally rich intellectual environment — against the notion of a ‘two cultures’, whereby the arts and sciences are viewed as separate entities. Crowther is one of Desmarais’s case studies, but in that chapter the theme of challenging the two cultures dichotomy tends to fall into the background.\footnote{Desmarais, ‘Science’, 3, chap. 5.} This is indicative of a tendency to assume that Crowther has little to tell us about relations between science and the arts.\footnote{Crowther ‘was much less closely associated with literary writers’, according to Michael H. Whitworth, \textit{Einstein’s Wake: Relativity, Metaphor, and Modernist Literature} (Oxford, 2001), 232, n.} Meanwhile, politically Crowther is usually portrayed as a straightforward Communist or fellow traveller. In this thesis, I seek to show that the political and cultural heterogeneity that marked the post-war period also existed throughout the interwar period, against typecast portrayals of inflexible Marxists and an unbridgeable two cultures. Crowther’s friends consisted of practising scientists and non-scientists of different political persuasions, from the Communist novelist and literary critic Ralph Fox, through the Labourite historian A.L. Rowse, to the liberal chemist Bernard Mouat Jones. Members of the Bauhaus art movement — such as Walter Gropius, László Moholy-Nagy and György Kepes — were also Crowther’s friends (and Kepes’s attempts to unify science and art were inspired in particular by Crowther).\footnote{For more on the links between constructivism and science, see Boris Jardine, ‘Scientific Moderns’ (University of Cambridge Ph.D., 2012) though Crowther does not feature much there.}

Even if only implicitly, existing literature on the culture and politics of British science in the interwar period tends to adhere to a ‘two cultures’ conception of intellectual life: if professionalization excluded those without qualifications from commenting on science, then it also rendered scientists uninterested in anything other than their highly specialized subjects. First formulated by C.P. Snow in 1959...
when he lamented the lack of scientific understanding amongst ‘literary intellectuals’ (and literary knowledge amongst scientists), it is assumed that Snow was commenting on a trend that he saw developing in the interwar period. The notion therefore exists in two of the most influential studies of interwar science, Gary Werskey’s *Visible College* and William McGucken’s study of the social relations of science movement. Both demonstrate how some scientists became increasingly aware of the social implications of science, and how science could be used to salve the multiple crises of the 1920s and 1930s: most obviously economic depression and the rise of totalitarianism. Werskey’s account falls into two cultures thinking in two ways. Firstly, as mentioned in the previous section, because Werskey is mostly concerned with practising scientists, he underestimates the importance of interpreters such as Crowther, who were nevertheless influential figures. Secondly, Werskey contrasts his subjects with representatives of ‘high culture’ and ‘high science’. The former were trained in the classics, history and literature, averse to the visible college’s politics and intimidated by their increasing role in British culture. Within science, meanwhile, Werskey stereotypes ‘high scientists’ as politically unsophisticated conservatives. Similarly, McGucken overlooks any connections between scientists and other individuals, because he focuses on scientific institutions such as the BAAS. A related issue with these works is their tendency to minimize differences between their subjects: the idea that there was a single social relations of science movement that incorporated figures as politically diverse as Richard Gregory, the physiologist A.V. Hill and Bernal is debatable and, by labelling them the ‘visible college’, the differences in political outlook between the five ‘members’ are downplayed by Werskey in favour of their commitment to scientific socialism.

Werskey’s and McGucken’s accounts need reinterpreting in light of recent work on the place of science and technology in twentieth century Britain. Most notably, the two cultures argument has been scrutinized, and there has been a

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85 I am indebted to Desmarais, ‘Science’, 11–13 for this analysis of Werskey’s and McGucken’s works.
growing interest in right-wing intellectuals. Guy Ortolano has argued that the two cultures altercation between Snow and the literary critic F.R. Leavis should be regarded as reflecting contrasting liberal ideologies stemming from a particular context (Cambridge University in the 1960s). For the interwar period, Boris Jardine has challenged Werskey’s belief that Cambridge saw a gulf between the two cultures by revealing the deep links between artists and scientists, especially between Constructivism and the Social Relations of Science movement. Recent work has therefore moved beyond the kind of binary thinking displaying by the two cultures which, as David Edgerton contends, is a result of taking politically motivated public rhetoric at face value. The so-called ‘technocratic critique’, whereby Britain’s administrative structure was alleged to be dominated by classicists who lacked the scientific outlook necessary in scientific states (Snow’s lecture was one expression of this), has been particularly influential on subsequent historians. However, science, contrary to the visible college’s arguments, was not neglected in Britain during the twentieth century, as a focus on the warfare state shows. By uncritically adopting actors’ politically motivated ‘declinist’ rhetoric, the cultural and intellectual history of the twentieth century has been distorted in favour of the Left and the notion of two cultures. An example of this is Haldane’s disingenuous claim that Percy Bysshe Shelley and John Keats ‘were the last English poets’ to know about science (particularly chemistry): it suited Haldane’s aim, of increasing the cultural prestige of science, to claim that it was being neglected in the present.

Crowther certainly contributed to this technocratic critique of British culture, but to associate him and other left wingers with the promotion of expertise and technocracy is to simplify matters. Competing visions of how to regenerate Britain after World War One cannot be divided in terms of advocates for science

86 Guy Ortolano, The Two Cultures Controversy: Science, Literature and Cultural Politics in Postwar Britain (Cambridge, 2008). Paul White has also reinterpreted the nineteenth-century debate between T.H. Huxley and the literary critic Matthew Arnold — often seen as evidence of a developing rift between the sciences and the arts — stressing the common ground between them and showing that Huxley was in fact attempting to establish one culture rather than two; White, Huxley, chap. 3.
(and professionalization, specialization and efficiency) on the one hand and opponents on the other.\textsuperscript{90} Crowther’s declinist rhetoric was predicated as much on the dangers posed by academic specialization as on the hazards of a lack of appreciation of science. This attitude linked figures as diverse as Crowther, Rowse, Hogben, and the Christian apologist G.K. Chesterton (1874–1936). Chesterton wrote that ‘science means specialism and specialism means oligarchy’; as shown in chapter 4, Crowther similarly associated the rise of fascism with specialism and narrow expertise.\textsuperscript{91} In fact, there was a prominent strand of romanticism to Crowther’s thought, which had its roots in the independent working-class education and freedom school movements discussed in chapter 1. Here, there was an emphasis on the rural, freedom, and individual self-development. If this implied a certain uneasiness with the modern industrial world, the solution was not to have a moratorium on scientific research, as the Bishop of Ripon demanded. Rather, as Hogben put it, ‘the world wants sympathy and justice to use and distribute the fruits of science — not more discoveries and inventions.’\textsuperscript{92} Crowther’s syntheses — intended to unite ‘the inco-ordinated pile of knowledge gained by specialization’ — aimed to provide the knowledge necessary to better distribute the benefits of science.\textsuperscript{93}

As this suggests, Crowther was not straightforwardly left-wing, if such a thing exists: his views were distinctive, at times inconsistent, and changeable. Unfortunately, his archive is somewhat silent on the matter of political activism, though it does contain his 1923 Communist Party application, which suggests that the archive was not filleted of sensitive material. Though it is impossible to argue from lack of evidence, there is little to suggest that Crowther was particularly close either to the CPGB leadership or the Soviet Union itself. Arguably his closest contact with the latter, as Technical Advisor, ended when the

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\item \textsuperscript{91} Quoted in Anna-K. Mayer, ‘“A Combative Sense of Duty”: Englishness and the Scientists’, in Mayer and Lawrence, Regenerating, 81–82.
\item \textsuperscript{92} Julian Sorell Huxley Papers, Woodson Research Centre, Rice University (henceforth JHP), Box 8, Hogben to Huxley, 2.4.25.
\item \textsuperscript{93} J.G. Crowther, An Outline of the Universe (London, 1931), xii.
\end{itemize}
ussr discovered that Crowther’s committee was achieving little. In fact, the evidence suggests that Crowther had mixed views about the Communist Party, and that he was probably only a member for one year. There is certainly no evidence in Crowther’s archive of the tiresome branch meetings, incessant leafleting or prescriptions from on high that characterized life as a CP member. According to the surviving evidence, Crowther did not correspond with Party notables like Harry Pollitt or Rajani Palme Dutt; nor did they mention Crowther. Crowther either lost contact with his Party peers around 1923, or they went on — like E.A. Higgins — to drop out of the Party. The exception is Ralph Fox, although there is evidence to suggest that even he became disillusioned with the Party before he left for Spain in 1936. The evidence presented throughout this thesis suggests that Crowther was not a Party member: in 1929, the (admittedly comedically inept) British Security Services concurred, deciding that Crowther was not a Communist.

However, Crowther is usually portrayed as a class-against-class Third Internationalist, forged in the pre-Popular Front era. It is certainly true that he became politicized during the crest of the revolutionary wave that swept across Europe after World War I. However, to see a line of descent from Crowther’s utterances in the early 1920s to his actions in the 1950s overlooks the mutability of his beliefs, and misinterprets the nature of his early Bolshevism. For example, Crowther clearly admired Lenin, who certainly advocated vanguardism but who also supported an alliance with Labour. Crowther conformed to the policy of a “United Front”, and was a key player in the 1930s Popular Front. As shown in

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94 I find Chilvers’s claim that Crowther was told by the CPGB to keep his head down and concentrate on writing implausible, given that he was not an ‘authoritative intellectual’ for most of the 1920s: Chilvers, ‘Dilemmas’, 420, n.14. Crowther possibly joined the Party again around 1950, though the evidence is unclear.


96 This is based on a reading of the CPGB archive in Manchester.


98 ‘Crowther was... impervious to widespread anti-communist public sentiment, but he was equally unrepentant in defending his hardliner, class-against-class convictions that had first brought him into the Party in the 1920s’: Desmarais, ‘Science’, 147. ‘An anabashed Stalinist’: Chilvers, ‘Dilemmas’, 418, n.3
chapter 1, Crowther’s Marxism was formed of a distinctive mix of evolutionary biology and psychology, and his interpretation of scientific law meant that political strategy was constantly to be updated in light of new facts. Hence, he did not remain wedded to the idea of world revolution after it appeared implausible, and particularly after the 1926 General Strike. After May 1926, he wrote in 1931, he had no trouble understanding Stalin. If this meant anything (it appears in a flippant application for a readership, in the same year that Crowther told Ernest Rutherford that he did not like to seek academic appointments), it surely meant that after the failure of the General Strike, with the chance of world revolution receding, Crowther saw the sense in Stalin’s turn to socialism in one country.

Politically, as we shall see, Crowther often found himself occupying the middle ground. Communists attacked his histories of science for not being radical enough, as shown in chapter 4. Crowther allowed for scientific genius within the broad economic structures of his subjects’ eras, and their biographical form was unusual for determinist histories, which tended to shy away from focusing on individuals. They therefore found favour, for different reasons, amongst a range of people. In chapter 4, I also highlight the hopes placed in the USA by Crowther and others, which — with the New Deal — seemed to be achieving a workable balance between democracy and planning. This attempt to find a compromise between freedom and organization was also evident in debates over freedom in science, as Crowther and others in the Social Relations of Science movement wanted to preserve intellectual liberty.99 At the same time, I tease out the genuine differences between Crowther and left-wing scientists.

Crowther’s career, like that of Snow, is in many ways an argument against the existence of two cultures. Crowther aimed, as suggested in chapter 3, to make science a material for literature, to develop a class-conscious and scientific aesthetic, and in doing so to maintain a single culture in the face of increasing specialization. He wrote two scientific novels, Tommy Hobson (1926) and BISRA (1929), which remained unpublished but indicate his early literary ambitions. In his interpretations of science, Crowther sought a cultivated style of

99 This point is made in relation to Bernal in Jardine, ‘Scientific Moderns’, 126–127.
writing modelled on the King James Bible. And in the 1930s, reviewers compared Crowther’s histories of science to Lytton Strachey’s *Eminent Victorians* (1918). By the Second World War, as research scientists took up important war work, Crowther was appointed head of the British Council’s Science Department, tasked with publicizing Britain’s scientific achievements.

However, while the left’s attacks on traditional literary culture were certainly rhetoric designed to achieve cultural prominence, and while the debate between Snow and Leavis reflected circumstances unique to Cambridge, it is important not to discount the specific and real experiences that informed interpreters’ declinist arguments. Eric Hobsbawm suggests that the Snow-Leavis clash had its roots in the 1930s, and the origins of UNESCO in the 1940s have been interpreted as a setting for the later debate.¹⁰⁰ In Crowther’s case, his inability to remake Oxford University Press and the British Council to serve his aims, as we shall see in chapters 2 and 5 respectively, led him to believe that science was undervalued in Britain. Following Ortolano, these experiences are interpreted here less as disciplinary disputes, and more in political and social terms.¹⁰¹ So, while World War II certainly offered Crowther new opportunities, and Britain’s performance in the war gave the lie to his declinist arguments (he even participated in the rise of patriotic fervour), his hopes for the British Council’s Science Department were ultimately unfulfilled.

In the interwar period, three prominent models for the interpreter existed: H.G. Wells, Julian Huxley and J.B.S. Haldane. Wells was a professional writer, Huxley and Haldane were practising scientists before becoming interpreters.¹⁰² Crowther was neither, but wanted to be both. My topic, structured chronologically, is therefore the construction of this hybrid identity, and the ways and means by which Crowther tried to shape the public’s attitudes towards


¹⁰¹ See also Jardine, ‘Scientific Moderns’, 11.

science. We begin with an attempt to make socialists and, appropriately, with a very public attack on Wells.
A Revolutionary Education

Shortly after returning from a visit to revolutionary Russia in 1920, H.G. Wells responded to an accusation that his first action upon landing in Britain was to visit the Foreign Office to ‘report to his masters’. The charge — that Wells was spying on behalf of the government — appeared in the Plebs Magazine, a journal devoted to radical, independent working-class education that had a lively correspondence section and sold around six thousand copies in the early 1920s. Plebs expressed, Wells wrote in Russia in the Shadows (1921), the Marxist ‘cult… in exactly the same phrases as in the Russian Pravda.’ Wells’s attacker was not impressed by this reference to Plebs in ‘his latest pot-boiler’: indeed, it was obvious that ‘Wells is lost to us. He might have made a grand proletarian, but the fleshpots of the bourgeoisie seem to have proved too attractive.’ Such language was unlikely to appeal to Wells, though it goaded him to reply:

What a black suspicious soul is this of J.G. Crowther’s!… Why, because I don’t use the silly Marxist jargon of “proletarian” v. “bourgeoisie,” the vaguest, silliest words in contemporary thought, must J.G.C. assume I am dishonest, sold, and all the rest of it?… I guess when there is real revolutionary work to do or real order to be established we shall find the Crowthers… together in the last, most distant ditch, still disapproving highly of everyone and calling us all bought men.

This encounter between the cocksure twenty-one-year-old radical and the established fifty-four-year-old reformist is instructive, as it encapsulates many of the reasons why — according to Jonathan Rose — Marxism failed to catch on in Britain. Doctrinaire, egocentric and spouting jargon, Marxists simply failed to appeal to working-class autodidacts, who preferred classic literature to Marx. British Marxism was ‘scientific’ and therefore inflexible; derived from economic and historical data, the materialist conception of history described the inevitable

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1 Plebs, February 1921, 58.
2 H.G. Wells, Russia in the Shadows (London, 1921), 67.
3 Plebs, February 1921, 58.
4 Plebs, March 1921, 87.
This chapter explores Crowther’s politicization in the early 1920s, which is not only essential to understanding his career as an interpreter of science but also reveals an alternative British Marxism to that described by Rose — one that was flexible, left room for human agency and was, above all, understandable. In these years, Crowther became involved with what I call ‘revolutionary’ education: on the one hand, independent working-class education for adults (a movement centred on the Plebs League and the Labour Colleges); on the other, ‘progressive’ education for children, which endorsed concepts like individuality, freedom and growth. Both were united, for Crowther, by their opposition to formal forms of learning and by their underlying political purpose. Both were about self-realization — of Crowther himself, of children, of the working classes. Both, I argue, were also about ‘making socialists’. After the First World War, radicals grappled with how to bring about a transformation of society: was it to happen through parliamentary reform, through revolution, or by dismantling the state? As socialists wrangled over these possibilities, we are told, the nineteenth-century strategy of ‘making socialists’ suffered a decline. Within the League, however, making socialists was a necessary precondition to making revolution; progressive child education, meanwhile, encouraged children to grow into socialists.

The Plebs League informed Crowther’s socialism. Indeed, though Crowther has been associated with ‘university-trained intellectuals’ within the League, he was initially a student and he learnt about the biology and psychology that underlay Plebs’ attempts to make socialists and revolution. He therefore complicates — as a man in the middle — the assumed hostility between university-trained intellectuals and workers within the League. Though from a

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middle-class occupational background, Crowther lacked a university degree and supplemented his Plebs learning with his own, self-directed reading in the autodidact tradition. Like other autodidacts Crowther was, if not anti-intellectual, then certainly wary of intellectuals. Crowther and his earliest childhood friend, Ralph Fox (1900–1936), positioned themselves between intellectuals on the one hand, and practical men on the other — ideas had to have a purpose.9

In line with my claim in the introduction that Crowther’s politics were more complicated than is often assumed, I argue that Crowther and his allies attempted to develop an alternative Marxism that was non-dogmatic and — though ‘scientific’ — left room for human will and individuality. In collaboration with the economist Maurice Dobb (1900–1976), Crowther embarked upon a project to update Marxist thought for the twentieth century, in light of developments in biology, psychology, economics and scientific philosophy. Theirs was a scientific socialism, but not in Engels’s sense of the working out of a deterministic law. They also aimed to render Marxism in simplified language, so that it could act more effectively as propaganda, and solve the complaints of many workers that Marxists wrote ‘for one another instead of for working-class people’.10 In attempting to update Marxism, the ‘intellectuals’ within the Plebs League may have shown a greater awareness of how to make Marxism appealing than did the defenders of a rigid orthodoxy.

Making a Marxist

Crowther’s conversion to socialism, his involvement with the Plebs League and progressive child education was preceded by personal disappointments and existential crisis; his early education and successes held the promise of a great future that seemed, in the early 1920s, to have been frustrated. Crowther, like

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10 Harry McShane quoted in Rose, Intellectual, 305.
many of his contemporaries, turned to socialism because it could provide a sense of purpose and meaning; as a theory of society, it promised to integrate all his wide interests into a coherent whole.\textsuperscript{11}

Crowther came from a cultivated family. His father, James, was head of a technical college, whilst his mother, Alice, was a music teacher. From his mother, he likely derived his love of classical music, especially Beethoven; from his father probably came an early interest in science, especially Newton. Though Crowther’s father’s letters show sympathy and support, Crowther later portrayed him as overbearing, and responsible for Crowther’s anti-authoritarian streak.\textsuperscript{12} Certainly, Crowther and Dodo, his elder sister who studied English literature at Newnham College, Cambridge, bonded over the oppressive atmosphere at home.\textsuperscript{13} ‘It is a melancholy place,’ Dodo wrote in 1921. ‘Already I feel clouds of depression settling on me.’\textsuperscript{14}

Bradford Grammar School offered some, but not much, respite. Crowther excelled at mathematics: an examiner of the algebra section of the Higher School Certificate exam wrote that Crowther’s answers were ‘the best set of problems I have had for a very long time... add 10 marks for general excellence’.\textsuperscript{15} While Crowther shone at science, many of his closest friends — notably Leslie Brayshaw and Ralph Fox — were drawn to the arts. Brayshaw later remembered that all he learnt at Bradford ‘was the futility & hollow sham of middle class authority & the narrowness & hatefulness of the Nonconformist conscience!’\textsuperscript{16} It is not clear when Crowther rejected conventional religious beliefs, but he made a point of arriving to school late in order to miss prayers — indeed, Crowther and Fox first spoke when Crowther upbraided Fox for making an effort to arrive early.\textsuperscript{17} By

\textsuperscript{11} Theodore M. Porter, \textit{Karl Pearson: The Scientific Life in a Statistical Age} (Princeton, 2004) interprets Pearson’s catholic interests as a search for meaning and purpose. As we shall see, Pearson was a big influence on Crowther.

\textsuperscript{12} See SxMs29/1/3/4/1, 15.10.36; SxMs29/1/3/5/1, 16.1.40; SxMs29/1/3/6/1, 22.12.43. In the later letters, Crowther’s father expresses progressive views, though it is not clear whether he held them when Crowther was growing up.

\textsuperscript{13} For information on Dodo, see Newnham College Register, 1913.

\textsuperscript{14} SxMs29/1/3/1, Dodo to Crowther, 17.11.21.

\textsuperscript{15} SxMs29/1/2/13.

\textsuperscript{16} SxMs29/1/3/1, Brayshaw to Crowther, 16.3.23.

\textsuperscript{17} For debates about the ‘decline’ of religion in Britain, see Jeremy Morris, ‘Secularization and Religious Experience: Arguments in the Historiography of Modern British Religion’, \textit{The Historical Journal}, 55 (2012).
1923, when Brayshaw fearfully admitted to Crowther that ‘for a long time atheism and agnosticism have seemed erroneous to me’, Crowther — like Fox and many other radicals — counted himself an atheist, ready to replace his dying nonconformist with Communist pieties.\(^\text{18}\) Arriving late for prayers probably signified little more than youthful rebellion, something that Crowther and Fox were prone to. When one headmaster noticed that boys had carved their names into a table, and ordered that they be removed, Fox wrote a sonnet entitled *On Hearing that the Names Carved Upon an Old School Table are to be Removed*. The headmaster saw this, and his visits to the prefects’ room were subsequently less frequent. ‘Thus Ralph had,’ Crowther wrote many years later, ‘by his creative genius, already as a schoolboy, struck an effective blow for liberty: for the liberty of youth against unimaginative and ungenerous discipline.’\(^\text{19}\) Fox also read William Morris, but his enthusiasm for Morris’s progressive politics made little impact on Crowther: whereas Fox was a conscientious objector, Crowther was rejected for military service for health reasons (possibly back pain).\(^\text{20}\)

In 1917, Crowther won a scholarship to study mathematics and physics at Trinity College, Cambridge. It was postponed due to the First World War, during which Crowther worked at the Anti-Aircraft Experimental Section in Portsmouth under the physiologist A.V. Hill (1886–1977). By the time that Crowther joined ‘Hill’s Brigands’ in 1918, Hill had assembled a talented mix of individuals — including the physicists R.H. Fowler (1889–1944) and E.A. Milne (1896–1950) to work on various aspects of air defence.\(^\text{21}\) Crowther received £150 per annum for working out shell-trajectories, and assisting, as he would later write, ‘in observations with Darwin-Hill height-finders, pilot balloons, torsional shell-
swinging to determine inertia, etc.” These few months, from the middle to the end of 1918, constituted Crowther’s only formal training in science.

‘It was at this time, about 1919, that Ralph first aroused my own political consciousness’, Crowther later recalled. Whether this emerging political awareness was a cause or a consequence of Crowther’s dropping out of Cambridge University is unclear. Certainly, Crowther’s cohort included such budding socialists as J.D. Bernal (1901–1971; natural sciences), H.D. Dickinson (1899–1969; economics), Maurice Dobb (1900–1976; economics) and Kingsley Martin (1897–1969; history), though there is no firm evidence that Crowther was yet involved with this small community of socialists. Crowther was much more likely to encounter war veterans: Royal Navy officers accounted for four hundred of the new students in 1919. The war had forced them, as it had Crowther, to postpone their education. But unlike Crowther, these new students had fought, and it would be surprising if Crowther was unaware of the disparity between their virile masculinity and his own inability to fight. This would have been especially apparent during the regular assaults meted out to the university’s socialist population by the battle-hardened students. Perhaps this atmosphere contributed to Crowther’s breakdown after only one term, though being in a self-appointed and persecuted minority with a sense that history is on one’s side was a usual condition for aspiring radicals. Alternatively, Rowse attributed Crowther’s breakdown to stressful war work. But the mathematics and physics tripos was surely the most proximate cause: it pushed students to the verge of mental and emotional breakdown, and Crowther was just the latest in a long line of those who broke. Thanks in part to the wartime neglect-of-science debate, the

22 SxMs29/1/3/1, A.V. Hill to Crowther, 3.5.18; SxMs29/1/3/1, Crowther to Secretary of Institute of Physics, 10.5.29.
23 SxMs29/9/12/1, ‘Ralph Fox’, 27.4.50, 20.
25 Dobb, for example, was thrown into the River Cam and had his room wrecked: Shenk, Maurice, 24.
26 Little evidence of the reason for Crowther’s breakdown exists in the archive, though there is a letter from Crowther to his father (probably unsent) in which he says that he failed the classics little-go exam, which was taken for a pass degree at Cambridge. A.L. Rowse, A Cornish Childhood: Autobiography of a Cornishman (1942), 210.
27 Andrew Warwick, Masters of Theory: Cambridge and the Rise of Mathematical Physics (Chicago, 2003), 182–191; see also Porter, Pearson, 39–42.
beginning of 1919 saw the expansion of research degrees and more state financing of research in Cambridge, as well as increased student numbers — just under seven hundred in Rutherford’s laboratory.28 Crowther had only a fleeting glimpse of these changes. To make matters worse, Trinity’s Fellows seemed unsympathetic — one ‘used to make jokes about my condition... No one had the time or the interest to help me to unravel my difficulties.29

By the early 1920s, Crowther was thoroughly dejected, and it was now that his socialist tendencies bloomed. Personal setbacks coincided with, and may perhaps have influenced, his growing socialism: a string of temporary teaching appointments, beginning with St. Austell Grammar School in March 1920, seemed to highlight his failure at Cambridge. He spoke to one of his students, the future historian A.L. Rowse, of the ‘desultoriness in which one seems to be engulfed’. One must have a plan, ‘a definite, — even a material aim, — before one’ the seventeen-year-old Rowse counselled:

Have you one? What do you intend to do or take? Are you thinking of going back to Oxford or Cambridge? Or do you entertain the possibility of taking an external London degree, — just for the purpose of teaching, while your real activities will go on in other directions as before? By these activities I mean your work for Socialism.30

Socialism gave Crowther a purpose, something to aim for. But whereas Rowse saw in Crowther ‘self-sacrificing zeal and... lofty ideals’, Brayshaw believed that Crowther’s radical political views were ‘a revolt (firstly) against the present State & so far directly concerns yourself’. Crowther believed it, too, and he corrected Rowse: ‘Distance lends enchantment to the view, and I am afraid my conduct is not much controlled by motives of self-sacrifice’. But surely, Brayshaw urged, ‘at the back of your mind you have a concept of social justice?’ Crowther’s personal dissatisfactions were certainly supplemented by depression about the chaos of the world. His radicalization occurred against the backdrop of industrial unrest and


29 SxMs29/1/3/3, 1931 CV and application for readership, 4.

30 SxMs29/1/3/1, Rowse to Crowther, 16.10.21.
rising unemployment. The post-war boom ended at the close of 1920; wages subsequently declined, strikes followed, and unemployment peaked at over two million in June 1921. Crowther informed Rowse in November of that year that ‘my ideals are broken in small pieces. Visions of perfection no longer relieve the gloom of the World-Chaos.’

Thankfully for Crowther, a diverse socialist movement existed in Britain by 1920. Radicals had a choice of organizations, from the Fabian Society and the Independent Labour Party (ILP) to the Workers’ Socialist Federation and the Socialist Party of Great Britain. All had their roots in the socialist revival of the 1880s and 1890s. People were able to move easily between these various groups, even after the most radical had joined to form the Communist Party of Great Britain (CPGB) in August 1920. Crowther was no exception — he attended meetings of the ILP, joined the CPGB in 1923 and put himself forward as a potential Labour Party parliamentary candidate for Taunton in 1925.

But of all the various socialist organizations in existence, Crowther’s emerging political opinions were expressed most clearly through the Plebs League, to which he was almost certainly introduced by Fox. A movement devoted to working-class education, the League originated in 1908 as a result of disagreements within Ruskin College, Oxford. Ruskin College had been founded in 1899 as an institution to provide Christian socialist education to working class men. As a result of attempts to create a closer relationship with Oxford University and in light of its ‘non-partisan’ teaching, a number of students came to argue for better links between the college and the trade unions. This was originally the aim of the

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32 Shenk, Maurice, 12.
League, however after Dennis Hird, the first principal of Ruskin College, was sacked for being in sympathy with the rebellious students, the League decided to create an alternative: the Central Labour College. This, dedicated to providing partial education to assist workers in fighting the class war, was soon followed by regional classes, and was particularly strong in South Wales. The movement for independent education received a boost after the First World War, and it became clear that the separate colleges required co-ordination. In October 1921 the National Council of Labour Colleges was established to perform such a function, and the Plebs League continued its role as an outlet for propaganda. The League was an obvious home for Crowther: it promised to provide him with an education, a purpose and a philosophy.

Making Socialists?

Crowther was not alone in being attracted to the Plebs League after World War I. He was accompanied by other young radicals like Lancelot Hogben (1895–1975), who had completed his physiology degree at Trinity College, Cambridge in 1916 before being imprisoned as a conscientious objector. In 1918, Hogben married Enid Charles (1894–1972), a fellow socialist and feminist who had studied mathematics at Newnham College, where she had been friends with Dodo. Hogben had an orthodox education, though he was probably aware at the time — as were the workers who attended Ruskin College in Oxford — that Cambridge ‘perpetuated a pattern of living inconsistent with the health and happiness of a large proportion of their fellow citizens’ (as he wrote in his autobiography). For Crowther, education formed the vital link between his personal situation and his politics. The League’s denunciation of university education and the extension movement (particularly the Workers’ Educational


36 Dodo remained friends with Enid, and ‘was amused to find her turned into a devoted parent’ in 1923; EUL MS 113/3/1/c, Dorothy Crowther to Rowse, 10.2.23.

37 Hogben, Lancelot Hogben, Scientific Humanist, 35; Rose, Intellectual, 269.
Association (wEA) as useless endorsers of the status quo clearly appealed, but it also promised to save the world through education with an overtly political edge: the socialist utopia could be effected by arousing class consciousness, which would result in revolution. The Plebs approach was fairly represented by Crowther himself when he wrote that a Pleb should ‘(1) Discover the cold truth. (2) Use it to punch the capitalists’ jaw.’38 In this section, I explore the strategies Crowther (and other Plebs) came to endorse, which were rooted in scientific knowledge, particularly of biology and psychology. Crowther turned to the Plebs League, at least in part, in an attempt to understand himself: unsurprisingly, biology and psychology bulked large in his education, as they had implications for understanding human nature and, therefore, the route to the New Jerusalem.

Since the socialist revival in the late nineteenth century, education had been a key strategy for socialists, and it was tied, as Piers Hale has shown, to understandings of evolution. William Morris hoped to ‘make socialists’, whereby people were to be persuaded to adopt communitarian attitudes and ways of life. Crucially, once adopted, these changes — brought about through environmental and lifestyle alterations — were passed down through the generations; they rested, in other words, on a Lamarckian understanding of the inheritance of acquired characteristics. As such, the people depicted in Morris’s influential utopia, News from Nowhere (1890), were no longer miserly or egocentric, unwell or ugly. This strategy suffered a decline as the socialist movement split between advocates of revolution on the one hand and those, like the Fabians, who advocated a strategy of ‘permeation’ on the other hand.39 Though a capacious society that contained individuals of different outlooks, Fabians generally rejected the idea of inevitable class conflict, were equivocal about Trade Unions, and instead focused their efforts on gradual reforms and persuasion of the ‘thinking’ middle classes in an attempt to develop a technocratic, centralized state. Sidney Webb, for example, regarded gradual change as inevitable, based on evolutionary theory and positivism.40 Within the 1LP, Ramsay MacDonald also developed a

38 Plebs, February 1924, 74.
39 Hale, Political, 175–178, 261–263.
distinctive brand of evolutionary socialism — that drew more from Auguste Comte, Lamarck and Herbert Spencer than from Darwin and Marx — to distinguish Labour from Bolshevism.\footnote{Jose Harris, ‘Labour’s Political and Social Thought’, in Duncan Tanner, Pat Thane, and Nick Tiratsoo (eds.), \emph{Labour’s First Century} (Cambridge, 2000), 11–12.} Though committed to revolution, a central concern for Plebs was how to arouse class consciousness: the strategy of ‘making socialists’ therefore lived on in a different form within the League, and was seen as a complementary tactic to revolution.\footnote{Stack, ‘Labour’, for an argument that the ‘making socialists’ strategy lived on in the ILP; Stuart Macintyre, ‘British Labour, Marxism and Working Class Apathy in the Nineteen Twenties’, \emph{The Historical Journal}, 20 (1977).}

If, during the socialist revival, fewer articles on Marx were published in left-wing periodicals than on Darwin, evolutionary works were still high on socialists’ reading lists forty years later, especially as few of Marx’s and Engels’s writings had appeared in English.\footnote{Hale, \emph{Political}, 182; for example, the future Minister of Health and contemporary of Crowther’s in the Labour College, Nye Bevan, bought a copy of Darwin’s \emph{Origin} upon arrival in London: Nicklaus Thomas-Symonds, \emph{Nye: The Political Life of Aneurin Bevan} (London, 2014), 33.} Indeed, thanks to Engels’s portrayal of Marxism as ‘scientific socialism’, Marxism came to rely upon an understanding of science and evolution.\footnote{David Stack, \emph{The First Darwinian Left: Socialism and Darwinism 1859–1914} (Cheltenham, 2003), 75.} Such issues were therefore of key significance for Plebs, especially as the sciences of evolution and heredity were changing rapidly in the early twentieth century: biology and socialism were defining one another at a time when both fields were fluid, and there was a constant need for interpreters. The editor of \emph{Plebs}, J.P.M. Millar (1893–1989), later badgered Crowther for articles on evolution: ‘Our people do not have the opportunity for getting this up to date in most cases and are apt to be relying upon books that date somewhat.’\footnote{SxMs29/1/3/1, J.P.M. Millar to Crowther, 12.9.28; see also letter dated 20.7.28, asking for a review of the Everyman’s edition of Darwin’s \emph{Origin}. In SxMs29/1/6/1, Millar to Crowther, 29.3.35, Millar asked for another article: ‘a lot of the books on evolution our people had read say twenty years ago or more were out of date’. On Millar, see John McIlroy, ‘J.P.M. Millar (1893–1989)’, \emph{Labour History Review}, (1990).} In the early 1920s, the mechanism of evolution — particularly whether acquired characteristics were inherited or not — was still debated by Plebs. As one correspondent asked: might a striking experience ‘leave its register on the mind
plate of a descendant? Eugenics also had its supporters: Eden Paul (1865–1944) — who in collaboration with his wife, Cedar (1880–1972), was a prolific socialist author and translator — like most on the left, enthusiastically endorsed it.

Crowther became convinced of an alternative position, one that rejected both the inheritance of acquired characteristics and human inequality, in favour of a focus on equality and the environment.

As Jonathan Rose points out, a student’s view of adult education is rare: Crowther’s initial involvement in the League can best be characterized as a student rather than a tutor, and his notes provide a valuable insight into the biology taught to working-class students. In his notebooks, thoughts on science, politics and literature coexisted. For example, one notebook from 1922 contained quotes from Thomas Hardy’s *Jude the Obscure* (1895), followed by minutes from an ILP meeting; immediately after the minutes, there came a long extract from C. Lloyd Morgan’s *Animal Life and Intelligence* (1891), which began:

Revolution in organic life is the destruction of one organism or group of organisms, and the replacement in its stead of a wholly different organism or group of organisms. During hard times there may be much revolution, or replacement of one set of organic forms by another set of organic forms.

It is hard not to see Crowther copying this down for its relevance to political strategy. His main lessons came, however, from Hogben and — more directly — from Henry Lyster Jameson (1874–1922), a zoologist who studied pearl formation and was heavily involved in the League.

Crowther attended Jameson’s lectures in 1920, and led a discussion class on biology at the end of the year. Jameson covered evolution, embryology, heredity,
variation, natural selection, mutation, and mentioned Mendelian inheritance. Significantly, he spoke about the ‘non-inheritance of acquired characters & its bearing on social problems’. Crowther subsequently noted that there was a ‘certain amount of doubt about this, but general rule is “acquired characteristics not inherited.”’ Hogben agreed: August Weismann’s experiments on mice had discredited belief in the changeability of humans’ inherent potentialities. But that did not render education futile. A poor child, Crowther wrote, had ‘as good initial characters’ as a bourgeois child, which meant that ‘One generation of education will make workers fit to govern’ — in other words, generations of learning and governing had not affected the biological make-up of the bourgeoisie, so workers could get up to speed in a relatively short amount of time, given the opportunity. For Crowther, different social classes were not biologically distinct: a rejection of Lamarckian inheritance did not, therefore, entail a wholesale acceptance of eugenics or strict hereditarianism, as is sometimes implied. For these socialists, as Hogben said, the human race probably reached its limit of variation long ago. Indeed, Mendelian inheritance suggested that ‘Theoretically... the species may reach the limit of variation; and it may even be that the human race has reached, effectively at any rate, this condition.’ This was an important point, as many in the labour movement were bewailing the ‘mental poverty’ of the newly enfranchised masses. Furthermore, Mendel suggested — contrary to Weismann’s theory of panmixia — that organisms did not degenerate in the absence of selective pressures, which implied that an epoch of rest would not result in decline. The motive force of human evolution henceforth became culture, which could change quickly: in his notes, Crowther provided the example of Germany, which had changed from a peace-loving to a war-like nation in one generation.

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52 SxMs29/1/2/19, Jameson to Crowther, 7.11.20.
53 SxMs29/1/2/19, Jameson lecture notes.
55 See, for example, Stack, First, 86–87.
56 Ernest Bevin, quoted in Beers, Your Britain, 86.
57 Socialist Review, April–June 1919, 151. For panmixia, see Hale, Political, chap. 7.
58 SxMs29/1/2/19, Jameson lecture notes.
Hogben wrote in the ILP’s Socialist Review that ‘the idea of competition... has a much less prominent place in present-day science... evolution has assumed a more peaceful aspect.’ This undermined capitalists’ use of Darwin to justify competitive capitalism, but it could also undermine class war. How, then, did Plebs justify class war? According to Crowther’s notes, whereas the ‘dynamic of progress’ in Palaeolithic and Neolithic times had been a struggle against nature for existence and against other tribes for land, the dynamic in modern times was class struggle. The division of society into two classes had its roots in slave society: ‘The slave captured from neighbouring tribe in war. The drive of the whip responsible for civilisation’. However, Plebs also looked to the New Psychology to naturalize class struggle.

Much has been written about the reception of psychoanalysis in Britain in the early twentieth century, but historians have tended to understate interpretations that regarded the new science as a tool for radical social reform. In Cambridge, the undergraduates that Crowther had left behind were encountering Freud: Bernal first read the Austrian shortly after becoming a Marxist in 1921, and predicted that psychology would usurp economics as the basis of Marxism — he saw the Oedipus complex as the impulse for revolution. Meanwhile, the New Psychology had been introduced to Plebs by Jameson and Eden and Cedar Paul. Jameson and the Pauls ranged beyond Freud, drawing upon a heady mix of the instinct theory of the likes of William McDougall, Arthur Tansley and Wilfred Trotter, and on the behaviourism of John Watson. As interpreted by Plebs, the New Psychology justified Bolshevism, and overcame some of the pitfalls of a narrow focus on economics. They drew upon the herd and ego instincts, but rejected the negative interpretation of Trotter’s ‘herd’, arguing instead that the

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60 SxMs29/1/2/19, Jameson lecture notes.
herd instinct was the powerful basis of any impulse towards communism.63 ‘Man is a social animal,’ the Pauls wrote, ‘but the fact has been obscured by the tendencies of capitalistic development during the last few centuries.’64 This conclusion would have been supported by Crowther’s contact with Hogben, and by his reading of Anton Pannekoek’s *Marxism and Darwinism*, which — drawing on Darwin’s *The Descent of Man* (1871) and Peter Kropotkin’s *Mutual Aid* (1902) — argued that close-knit groups were most successful in the struggle for existence.65 Capitalist culture emphasized the ego at the expense of the herd instinct, the latter of which ‘was reserved for window-dressing and Sunday best.’ But the herd instinct had a partial outlet in capitalist society, chiefly through nationalism and the class war. It was the job of Plebs, according to the Pauls, ‘to foster and accentuate the proletarian herd complex’ to bring about a revolution that would make the proletariat ‘the universal herd’.66

Crowther wrote a ‘preliminary essay’ on psychology for Jameson that began by defining the mind as the subject of study of the psychologist; the physiologist studied the brain, whilst the ‘Links of Correlation is the study of the Correlator’. The mind, psychologists had found, consisted of systems of thought controlled by instincts, ‘like networks of wires electrified by batteries.’ The existence of these instincts was ‘plain to anybody who considers the actions of people around him.’ For example, hungry men made plans to secure food; ‘the lover manufactures elaborate schemes for obtaining his lady’; ‘The Will-to-Power makes men develope [sic] their minds so that they can dominate others.’ Complexes were formed in the conscious and unconscious when ‘The instinct fashions a portion of the mind-stuff into a permanent shape which does not dissolve on the removal of its hand.’ Dissociated complexes could occupy the mind at the same time, as when reading a book ‘another train of thought is followed, such as, “what am I going to do this evening”.’ The will partly regulated which complexes rose from the subconscious to the conscious, as when the herd instinct ordered the will to

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63 For suggestion as the basis of altruistic, assocational life, see Gillian Swanson, ‘Collectivity, Human Fulfilment and the “Force of Life”: Wilfred Trotter’s Concept of the Herd Instinct in Early 20th-Century Britain’, *History of the Human Sciences*, 27 (2014).
suppress the sex complex in the case of a man looking at ‘a pleasant girl in the street’ who says ‘to himself “I would like to have her, but I am married and society would not allow it.” ’ Complexes could also be repressed, when certain instincts created ‘barriers’ for the complexes created by other instincts. ‘It has been observed that people with repressed complexes are confused and lack the power of decisive action. ’ Finally, there was projection, which could manifest as ‘Idealism, where a vision of perfection is held in the mind and worshipped, when Reality dissappoints [sic] the affections.’

As these examples illustrate, Crowther was as much concerned about obtaining a framework through which to interpret the behaviour of himself and others, as with justifying class war. Amongst other things, psychology could help explain sexual relations within the socialist movement. When Rose Cohen deflected the advances of E.A. Higgins, one of her many admirers, Crowther assured the latter that Cohen

is thinking of some one else or she doesn’t understand herself. Some people can successfully work off their sexual feelings in working for a cause or an ideal, but she isn’t one of them, any way, she oughtn’t to be one, because no intellectual ideal could really satisfy her, because she isn’t really intellectual.

Here was an application, in highly condescending terms, of the Freudian notion that culture relied upon the sublimation of the sexual instincts. Reassured that Cohen’s sexual feelings were intact, Crowther went on to explain that ‘nearly everyone’ in the Labour Research Department misunderstood Higgins: his ‘feeling against intellectualism is an effect of your strong unsatisfied paternal feeling’, but ‘most of the people round the LRD seem to be much too clever to bother about humble feelings of that kind.’ Viewing people in terms of their sexual or paternal emotions provided Crowther with an insight into their behaviour, as well as helping him to know himself.

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70 Esmonde MacDonald Higgins Papers, State Library of New South Wales, MLMSS740/11, 282–284, Crowther to Higgins, 20.9.23; for Cohen, see Francis Beckett, ‘Rose Between Thorns’, Guardian, (2004); for the LRD, dominated by CPGB members at this time, see Morgan, Labour, 60–87.
As Mathew Thomson points out, Plebs explained the phenomena of class-consciousness and conflict naturalistically, as complexes produced when an individual’s inborn instincts were frustrated by capitalist society.71 ‘Making socialists’ therefore became a matter of appealing to individuals’ herd instinct, against their exaggerated ego instinct. This belief, that political appeals were not made solely through the intellect, helps explain why Crowther joined the CPGB in 1923. As he wrote in his notes on W.H.R. Rivers’s *Instinct and the Unconscious* (1920):

> the presence of both suggestion & intelligence argues that the successful management of masses of people depends on an appeal to both & not to the latter only. This truth has been grasped by one section of the progressive movement only, i.e. The Communists. The reformists have pretended to recognise the latter only as the basis of appeal. The fact that intelligence will finally be the arbiter does not affect present circumstances.72

The masses were no more incapable of rational thought than anyone else, then, but Plebs could not neglect the importance of suggestion. And the appeal to instinct was made not only through socialist propaganda, but also in the method of education. To see how this worked most clearly, it is necessary to turn to child education.

Tiptree Hall

Some Plebs, notably Eden and Cedar Paul, interpreted independent working-class education holistically, as including elementary education. Just as the university peddled an ostensibly impartial knowledge imbued with the values of capitalism, so did the conventional school. As the Pauls argued in 1918, working-class children educated by the state grew up to be the ‘ragged trousered philanthropists’ of Robert Tressell’s novel, people who accepted their exploitation by bosses and regarded the existing order as immutable. The Pauls pleaded for Plebs to set up New Schools of their own, ‘in or adjacent to every big industrial centre’, so that children’s brains could be freed ‘from the octopus-like tentacles of

72 SxMS29/1/2/23, notes on Rivers’s *Instinct*. 
the class state.'\textsuperscript{73} John McIlroy suggests that the Pauls were preaching to the wind, and ‘were in a minority’ in attempting to develop the connection between revolutionary adult and child education, because most Plebs thought that little ideological impact could be made on children.\textsuperscript{74} However, the intention was not necessarily to indoctrinate: indeed, the Pauls recommended that socialist ideology be left out of child education, which should instead aim at creating conditions that would render children more likely to become socialists as adults.\textsuperscript{75} Some teachers attempted to develop a holistic approach to ‘revolutionary education’ in the League, and Crowther was one of them.

In looking to develop an approach to education that included children as well as adults, Plebs turned to the progressive movement. Though diverse, the progressives were motivated, as Norman MacMunn (1877–1925), who ran Tiptree Hall, a progressive school for war orphans (where Crowther worked from September 1922 to June 1923), said, by a belief that

> the world can be saved from still worse catastrophes [than World War I] only through its children, and this by nothing less than a new and fundamental conception of education, not as an artificial adaptation to the thought-habits and knowledge-groupings of their miseducated elders, but by giving them the chance to develop, from successive interests acknowledged, encouraged and provided for by their teachers, an almost new habit of exhaustive impartial and suggestive analysis.\textsuperscript{76}

Only by thinking for themselves, developing the self, and learning not to mechanically repeat their parent’s errors, could children avoid bringing civilization to crisis. Progressives considered conventional lessons to be deadening; forcing boys and girls to learn a particular topic for an hour before moving on to another subject (decided by the teacher) restricted a child’s freedom of thought. Related to this, many believed that education should aim to develop individuality — for MacMunn, this meant valuing difference. Perhaps most importantly, teachers were to become ‘one of the pupils’, or as MacMunn

\textsuperscript{73} Eden Paul and Cedar Paul, \textit{Independent Working Class Education — Thoughts and Suggestions} (London, 1918).
\textsuperscript{75} Paul and Paul, \textit{Independent}.
\textsuperscript{76} Norman MacMunn, \textit{The Child’s Path to Freedom} (London, 1921), 12.
preferred, ‘chief advisers’. The aura was one of democracy, solidarity, freedom and equality, the opposite of obedience to authority: here was how to make socialists. The Pauls suggested that Plebs had naturally arrived at similar methods, as it was impossible to force class-conscious proletarians to study subjects that they were disinclined to learn. Rather than consisting of a set series of lectures given ‘by throned and pulpeted “experts,”’ (the disparaging quote marks are notable), courses consisted of discussion classes, in many cases conducted by pupils. ‘It becomes a case of “do your own teaching” no less than of “do your own thinking.”’ Now “do your own teaching” is preeminently the method of libertarian child education! Such methods, which promised to make mini-socialists, could hardly be introduced in conventional schools, and the Pauls acknowledged that complete elimination of the pulpeted expert could only occur after the revolution. By his third temporary teaching appointment at the Colchester Junior Technical College, Crowther bore out the Pauls’ contention that ‘Revolutionists, no less, are many of our elementary school teachers, but they are shackled and gagged by the system under which they work.’ At Colchester, Crowther became decidedly more proletarian and revolutionary. It began when he coached the cricket team: ‘I had not been too happy over this bourgeois conduct, and in the autumn decided that one with my political convictions had better spend my spare time in more serious matters.’ So he moved to a proletarian area of the town to lodge with the family of a worker at Davey Paxman’s (the engine manufacturer); got involved with the local ILP; and ‘commenced political wire-pulling and internal agitation calculated to embarrass [H.P. Wilson, the headmaster at Colchester] as much as possible.’ Crowther was eventually asked to resign after telling school inspectors that the headmaster was unfit for his position and twenty years behind the times. Wilson wrote (presumably insincerely) in his reference that Crowther ‘maintains good

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77 Selleck, English, 48–54.
78 Paul and Paul, Independent.
80 Paul and Paul, Independent.
81 SxMs29/1/3/3, 1931 CV and application for readership, 7–8.
82 SxMs29/1/3/1, Fox to Crowther, [1921]; SxMs29/1/3/3, 1931 CV and application for readership, 8.
order in his classes, is a firm disciplinarian’ who ‘takes great interest in educational matters & in methods of teaching & he expresses his views with characteristic freshness & originality.’ For his part, Crowther had avoided attaining success in an orthodox school which, he wrote in his notebook, ‘marks the doom of the aspiring educationist.’

If an orthodox school marked the doom of an aspiring educationist, an unorthodox school could be the making of one. After the Colchester debacle, a sympathetic Thomas Percy Nunn — Professor of Education at the University of London and author of the influential textbook Education: Its Data and First Principles (1920) — put Crowther in touch with MacMunn. After visiting Tiptree, MacMunn wrote to reassure Crowther that

the work will grow on you. The youngsters will also grow on you. They will ask & you will give. I liked your calm with them — and I certainly saw no aversion. The work with kids in freedom is so wonderfully different. I hate teaching like the devil — except it arises out of youngsters’ own asking. There’d be no unwilling explanations — you’d simply be the uncle with a key to a cupboard of mysteries. The desire to learn from you will come to one or two first — & then your chance will come; & I feel certain you will find a job that will give you real happiness.

Crowther struck a similar note in a letter to Plebs asking “Should Teachers Teach?” which appeared in the same month that he started at Tiptree. Crowther thought that progressive educationists had done themselves a disservice by claiming that ‘teachers should not teach.’ They more accurately meant that the conventional definitions of “teacher” and “teaching” — ‘a member of staff in an ordinary school’ engaging in ‘a pitched battle in a closed space between a herd of young animals and an old bear’ — was incorrect. Rather, teachers were simply people who knew more than those they taught, and supplied them with correct information: proper teaching was ‘the advising of the less advanced by the more advanced learner.’

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83 SxMs29/1/3/1, Wilson to Crowther, 18.5.22.
84 SxMs29/12/9/9, miscellaneous notes.
85 SxMs29/1/3/1, Nunn to Crowther, 5.4.22.
86 SxMs29/1/3/1, MacMunn to Crowther, 19.5.22.
87 Plebs, September 1922, 327.
Tiptree was a mini-utopia. Like other progressive schools, there was a definite anti-industrial Romantic strain to Tiptree that Crowther, perhaps surprisingly, shared.\(^{88}\) Children were not restricted to a classroom, but worked outside: contemporary accounts of Tiptree recorded children playing amongst the ‘most beautiful & fascinating garden & orchard, with a lake.’\(^{89}\) Living was communal, as anti-elitist as possible, and children governed their own lives. The influence of this Arcadia on Crowther is demonstrated in his review of Fox’s *Captain Youth* (1922), ‘a romantic comedy for all socialist children’, which involved a boy replacing his dreams of slaying evil pirates with his adolescent attempts to slay capitalism. ‘Kant said’, Crowther wrote,

> that it was a mistake to imagine that childhood is the happiest period of life. It is true that a child’s capacity for joy is greater than a grown-up’s, but if the surroundings that make for happiness do not exist, what is the use of that capacity? How can the proletarians’ children be happy in the modern industrial city?\(^{90}\)

Capitalism corrupted the inherent goodness of children; it was with some justice that Fox told Crowther that he could write another *Emile*.

For Nunn, MacMunn and Crowther, education was therefore self-realization. And the New Psychology provided a scientific basis for the claim that education should nurture an individual’s inbuilt inclinations and interests. It was a teacher’s duty to guide a student to bring out their healthy impulses, not cram them full of facts. Crowther later fictionalized MacMunn in an unpublished novel (see chapter 2), in which he explains:

> “The child acts out his impulses, and comes to know himself, or if he does not, I can explain him to himself sympathetically. Self-knowledge is fundamental to happiness in a difficult world. In a perfect world this kind of knowledge is unnecessary since no one is handicapped by defects in his character.”\(^{91}\)

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\(^{88}\) Thomson, *Psychological*, chap. 4 emphasizes the shared romanticism of the new psychology and progressive education.


\(^{90}\) *Plebs*, December 1922, 468.

\(^{91}\) SxMs29/12/40/2, Tommy Hobson ts, 444.
Without the distortions of capitalism, the natural herd state of humans would emerge — one only needed to design an environment to bring it out. This focus on self-realization smacked of nineteenth-century radicalism, but it was not necessarily antithetical to Communism.92

In order to understand the full import of Tiptree, it is useful to make a comparison with the more well-known Malting House School, established by the eccentric Geoffrey Pyke in 1924.93 Because Malting House was based in Cambridge, historians have successfully sought out the links between it and the city’s many scientists, noting how it drew upon the New Psychology. In particular, Malting House has been portrayed as an attempt to create ‘scientists-in-miniature’. We see the same ambition, albeit in an attenuated form, at Tiptree, and especially in Crowther’s contribution. The progressive movement has long been portrayed as mainly promoting creative subjects such as music, literature and art.94 Nunn — later to be involved with Malting House — was an exception, and he recommended a couple of books to Crowther on paper folding: one was ‘rather of the nature of a snare, for it very soon gets the reader into advanced mathematics’ but another was more suitable for young children as it showed ‘boys how to make wheel-barrows, wind-mills, etc., of paper, and they learn the geometry incidentally — and very useful geometry too.’95 In his few months at Tiptree, Jimmy designed a board game which provided instruction in positive and negative numbers and geometry.96

But it was in cultivating a particular way of thinking that Crowther hoped to make ‘scientists-in-miniature’. From the start, a central aspect of MacMunn’s project was to encourage natural curiosity and ‘power of keen observation’ in children.97 Crucially, however, Crowther’s reading of the biostatistician Karl Pearson

95 SxMs29/1/3/1, Nunn to Crowther, 11.8.22.
96 SxMs29/1/3/1, ‘An improved apparatus for educational or amusement purposes’ patent application, 11.6.23.
97 See, for example, Josephine Ransom, Schools of To-Morrow in England (London, 1919), 119–120.
(1857–1936) informed his vision of the sort of citizen that education should produce. Crowther read Pearson’s *Grammar of Science* in 1922 in the months before he began at Tiptree; he was exhilarated. Nunn was not surprised: ‘I felt just like that when I discovered his book 30 years ago; I was absolutely intoxicated by it’. Crowther took many notes on *Grammar*, and copied down Pearson’s contention that ‘The first demand of the state upon the individual is not for self-sacrifice, but for self-development.’ This claim came during Pearson’s exposition of the importance of the method and content of science for forming sound citizens. Everyone, Pearson wrote, was ‘called upon to give a judgment upon an immense variety of problems, crucial for our social existence.’ People needed to attain knowledge of science in order to become sound citizens with impersonal judgement — in other words, a scientist. As we shall see later, this was precisely what Crowther attempted to achieve in his own writing. Scientific knowledge was also central to Crowther’s attempts to reform the Plebs League and, therefore, British Marxism.

Putting a Cow in an Oxo Cube

Within the League, Crowther aligned himself with others who suggested that Marxism needed updating in light of recent developments in science, such as Dobb, Hogben and the journalist Raymond Postgate (1896–1971). In the current secondary literature, these elitist, ‘university-trained intellectuals’ are pitched against ‘genuinely’ proletarian Plebs such as W.W. Craik (a railway worker) and Fred Casey (a watchmaker), both of whom argued for the continued relevance of the nineteenth-century Hegelian philosophy of Joseph Dietzgen (1828–1888). A German tanner, Dietzgen had arrived at a dialectical materialist philosophy independently of Marx and Engels, and his *Positive Outcome of Philosophy* (1906) influenced many British Marxists in the early 1900s. University-trained

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98 SxMs29/1/3/1, Nunn to Crowther, 28.6.22.
intellectuals, we are told, made a sustained attack on Dietzgen in the pages of *Plebs*, in order to eliminate his influence.\textsuperscript{102} Tim Putnam further suggests that Hogben, Dobb and Postgate promoted the authority of scientific expertise over that of philosophical, self-trained autodidacts.\textsuperscript{103}

In this section, I argue that Crowther was involved in a project to create a Marxism that avoided many of the problems that Jonathan Rose identifies as deterring autodidacts (not unlike Crowther) from Marxism. Crowther embarked, with Dobb, on a collaborative effort to write a series of essays on ‘Scientific Philosophy and Historical Materialism’ which being unpublished have, understandably, never received much attention. Nevertheless, they reveal that far from being a sterile exercise in promoting expertise, Dobb and Crowther thought that injecting science into historical materialism could invigorate it. But this was only true if science and Marxism could be expressed in a language that workers could understand easily. This latter insight is crucial when it comes to considering Crowther’s interpreting, and we shall see time and again throughout the thesis that Crowther emphasized the importance of a plain style. Crowther’s awareness of the potential political implications of having scientific facts explained in simple language had its origin in the *Plebs Magazine*.

Associating Crowther with ‘university-trained intellectuals’ is problematic because he shared with many, on the political right and left, an aversion to intellectuals.\textsuperscript{104} We have already seen that Crowther spoke deprecatingly of the ‘much too clever’ Oxbridge Communists who amassed round the LRD, who — he implied — were unwilling or unable to heed the emotional and instinctual aspects of life. The sense that the cloistered academic world was deficient recurred throughout Crowther’s writings, and he came to associate it with narrow expertise, as we shall see. This attitude possibly arose from his separation from the academy, though attendance at Oxbridge could certainly have the same effect, as it did for Fox.\textsuperscript{105} Fox saw intellectuals as a negative influence on the left, and the ferocity with which he denounced intellectualism in his letters to Crowther

\textsuperscript{102} Réé, *Proletarian*, 39–44.
\textsuperscript{104} Collini, *Absent*, 110–126.
\textsuperscript{105} A point made by Robert Colls, *George Orwell: English Rebel* (Oxford, 2013), 106.
suggests a shared scorn. Plebs contributors, Fox told Crowther, ‘move in formulas as much as any hide-bound clerical... the movement, splendid in itself, suffers terribly from these very intellectuals with their devastating lack of imagination. And we shall never win without imagination.’ This outburst had been prompted by one particular contributor to Plebs — Ernest Johns — who engaged in a long-running debate with Fox over Shelley. Johns argued that, since Shelley lived through capitalist democracy, his poetry and outlook was necessarily influenced by that society; Fox defended Shelley as a humanitarian, pacifist socialist. Even in 1921, then, Fox and Crowther were not hostile to what the more dogmatic dismissed as ‘bourgeois’ literature. Fox enlisted Crowther’s help in responding to ‘that awful fool Johns’. They wrote that

the materialist conception can account for nothing in the social sciences, any more than the physical scientist can give the “Why” of any single phenomenon. It is a method of research, an acid test, a widening of outlook and a great contribution to human knowledge. But that is all. It has its limits. We shall be wise to keep within them.

Crowther expressed the same willingness to depart from dogma in his essays with Dobb.

As with most Marxist literature, the problem with Dietzgen was that he left most students — whatever their background — flummoxed. Dobb, in a letter to Plebs, called the academic philosophy as taught by the League ‘mere verbiage’ and ‘juggling with words’, and criticism of Dietzgen’s rhetoric came from all directions. Crowther certainly agreed, and in his letter to Plebs supporting Dobb, he identified himself with those who learnt in the evenings and therefore did not have time to master a special phraseology. He turned the demand for accessible writing into a general principle: it was obvious to him that books and

106 Crowther’s letters to Fox have not survived.
107 SxMs29/1/3/1, Fox to Crowther, [1921].
109 SxMs29/1/3/1, Fox to Crowther, [1921].
110 Plebs, May 1921, 157.
111 For workers’ difficulty in reading Marxist literature, see Rose, Intellectual, 305–307.
magazines ‘should be written in especially simple, easy language’, since most Plebeians had to work for at least eight hours a day before studying. Crowther identified himself as one of the workers: the translations of Dietzgen, and Craik’s letters to *Plebs*, ‘are written in bad English which I [and, by implication, other workers] cannot understand’. For Crowther, it was people like Craik who were arrogant, not university intellectuals, because they glibed at ignorance and failed to explain things in an understandable way: ‘I should say M.H.D[obb]. knows he is ignorant and wants to learn. As Craik understands [Ernst] Mach and Dietzgen, why doesn’t he *explain* their theories to M.H.D.?‘

Dobb and his accomplices wanted ‘a few clear and essential notions about the scientific method and modern science’. Scientific philosophers such as Bertrand Russell — ‘an exceedingly clear writer’ — provided this: far from being a specialist whose language was too obtuse, he expressed himself clearly and simply. Plebs also dismissed works by the likes of Karl Pearson and Ernst Mach as ‘positivistic’, despite the fact that their outlook, as Dobb claimed, was ‘much the same as Dietzgen’. In August 1921, ‘P.L.E.B.’ recommended Pearson and Mach as tools by which Dietzgen could be expressed more simply, and scolded other Plebs for disregarding them: ‘… by neglecting to honour those who cast out devils by another name we only aggravate the charge of doctrinarianism which our opponents bestow upon us.’ Dobb and Crowther were also charitable to Dietzgen who, they said, ‘was considerably in advance of his time in some of his philosophical views’, particularly when he claimed that the distinction between mind and matter was not as fundamental as once supposed, that science was the organization of experience by thought and that there was a mental element in the notion of cause and effect. Far from wanting to expunge the dialectic, Dobb (and Crowther) saw it at work in nature and claimed that the ‘ultimate reality is the swirl of experience, a process in continual state of change.’ These ideas, they pointed out, were those of modern scientific philosophy as propounded by Mach

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113 *Plebs*, February 1924, 79.
114 *Plebs*, November 1923, 516–517.
115 Rée suspects Hogben wrote under this pseudonym: Rée, *Proletarian*, 40; *Plebs*, August 1921, 276.
116 SxMs29/12/9/9, ‘Dietzgen’ ts, 6, 3–4.
117 Putnam, ‘Proletarian Science?’, 81; SxMs29/12/9/9, ‘Marx & Engels’ ts, 5.
and Pearson. The so-called ‘anti-Dietzgenites’ did not, therefore, want to reject Dietzgen’s insights, but rather express the wheat of his philosophy in a simplified fashion. For their critics, this was to ask for something with ‘the strength of a cow in an Oxo cube’; no substitute could provide the nourishment of Dietzgen’s meaty philosophy.  

Plebs were not just being doctrinaire according to Crowther and Dobb; by failing to take into account modern science, they were acting contrary to the teaching of Dietzgen and Marx. Deifying Dietzgen, and taking his work as the culmination of philosophy, had led to a ‘dogmatic finalism’ and a ‘crude rigidity’ that was alien to historical materialism. Hogben said in his appreciation of Dietzgen in 1919 that ‘Dietzgen’s philosophy is not final, he rejects finality, as does the scientific method.’ Crowther and Dobb considered it curious how often Marxists completely fail to apply their own methods of historical interpretation to the works of Marx and Dietzgen, and ascribe to their works a final truth (which Marx would have been the first to disavow) instead of regarding it as necessarily conditioned by the state of science and knowledge of their time.

Since Dietzgen and Marx had taken contemporary science seriously, their work needed updating in light of scientific developments since the end of the nineteenth century. In ‘The Future of Marxism’, an essay Crowther drafted round this time, he summed up the argument: Marx ‘made use of all the knowledge of his age’ to help him develop ‘his theories to serve him as guides in the struggle for the emancipation of the proletariat.’ Modern Marxists needed to extend his theories where they need extension, and to express them in modern phraseology, where modern phraseology is clearer, than Marx’s own. The latter is necessitated by the demand of propaganda: words must be familiar if they are to be understood.

Though calls for clear and concrete language were made in the labour movement from 1921, they were not widely followed until the Popular Front era, which

118 Plebs, February 1924, 79.
119 SxMs29/112/9/9, ‘Dietzgen’ TS, 1.
120 Plebs, May 1919, 54.
121 SxMs29/112/9/9, ‘Dietzgen’ TS, 2.
122 SxMs29/112/9/9, ‘The Future of Marxism’ MS.
attracted more people to the CPGB (which suggests that jargon did deter people from Marxism, as Rose claims).

Crowther and Dobb’s attempt to update Marxism in light of modern science needs to be seen in the context of internal political tension within the League, which cut across commonalities in educational background. The formation of the CPGB caused increasing friction, as it came to emphasize the importance of political action and Leninism above enhancing class-consciousness via education. Some members of the League helped set up the CPGB, and from 1921 Plebs saw attempts to connect the Party’s politics with the educational activities of the League. By the beginning of 1923, the CPGB had a definite, direct policy on education: it should be controlled by the Party, and comrades within organizations such as the League were urged to agitate in order to render them adjuncts of the Party. These developments coincided with Crowther’s obtaining a party card in 1923; Dobb acquired his in 1922. At the same time, others who had initially been attracted to the CPGB severed their connections with it.

Crowther’s response to these developments can be inferred: he continued to support and contribute to the Plebs League into the 1930s. At the same time, he lost contact with Communists like William Paul and Eden and Cedar Paul.

By updating historical materialism, Crowther and Dobb warranted Bolshevik-like intervention in history: theirs was a ‘scientific’ socialism that took a more modest, and flexible, view of scientific law. Pacifists, who hoped that the revolution would happen inevitably, without human intervention, made two errors. Firstly, they left human impulse out of history by ‘trying to describe human conduct in terms of existing [Newtonian] laws of mechanics’; such fatalism, though, ‘is in contradiction to modern conceptions of time and change,'

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126 For Crowther’s application to the cp, see SxMs29/1/3/1, Albert Inkpin to Crowther, 7.3.23 and 19.3.23; Shenk, Maurice, 33.
128 As did Dobb: Shenk, Maurice, 35–36.
which have received additional justification since Einstein’s discovery.’

Secondly, they misunderstood the nature of scientific laws: ‘Genuine pacifism arises out of a misunderstanding of the nature, and hence over-respect for, scientific truth.’

Theories dealt in probability, not certainty. As Crowther flippantly put it, ‘scientific laws do not control nature, but describe it; in short, a scientific law is not a mother-in-law.’ Theories were only ‘true’ to the extent that they enabled ‘a forecast of the future’ and could therefore act as ‘a basis for successful action in the future.’

On this basis, historical materialism could be considered a scientific theory, as its value lay ‘in showing what, on the basis of existing conditions, is the most probable outcome, in the future, and in what direction, consequently, it is likely to be most profitable for mankind or a class to expend its energy.’

This meant that Plebs could engage in revolutionary activities, an attractive prospect under the invigorating example of the Bolshevik Revolution and at a time when capitalism seemed to be on its last legs.

Throughout the Dietzgen debate, Dobb and his associates implied a general confidence in the power of the scientific method — if written in common, understandable English — to bring about socialism. ‘It is the scientific outlook or attitude of mind — the habit of thinking scientifically and not metaphysically’, Dobb wrote, ‘that we want to develop.’

Such a belief in the power of education to effect change derived in part from Comte’s ideas about the development of historical stages — from the theological, through the metaphysical to the positive. According to Comte — and Crowther thought that Marx had ‘rashly’ dismissed Comte as a shallow thinker — the transition to the ‘positive’ (or scientific) stage would not require compulsion, but could come about through education: properly informed about the potentialities of science, people would demand

129 SxMs29/12/9/9, ‘Ethics’ ms, 9; SxMs29/12/9/9, ‘Scientific Method & the Notion of “Cause”’ ts, 8.
130 SxMs29/12/9/9, ‘Ethics’ ms, 8–9.
131 SxMs29/12/9/9, ‘What is Science’ ts, 3; see also Jameson’s comments in Plebs, May 1921, 140.
132 SxMs29/12/9/9, ‘Scientific Method & the Notion of “Cause”’, 5.
133 For Dobb’s belief that capitalism was at its final crisis in the early 1920s: Overy, Morbid, 65–66.
134 Plebs, March 1924, 118.
change which would remove the need for dictatorship.\textsuperscript{135} Jameson outlined the basis for this argument in 1921. If the capitalist state taught theories of causation, cosmic and biological evolution, and determinism in the realm of human behaviour, he suggested, it would create ‘a nation of thinking, questioning people, who might — who almost certainly would — early rebel against and overthrow the existing order.’ Pre-scientific, or metaphysical, thinking persisted because it fostered a ‘type of mind divorced from the scientific spirit of scepticism and questioning of the existing order.’\textsuperscript{136} Merely by thinking scientifically and not metaphysically, people would see the contradictions inherent in capitalism.

Crowther began writing articles for a number of periodicals at about the time that this debate in \textit{Plebs} fizzled out; he had evidently taken to heart Dobb’s injunction that science and its method needed to be expressed in simple language.

Conclusion

If Marxism did not appeal to the British working-classes, as Jonathan Rose argues, I suggest that this was not through want of trying. People like Crowther and Dobb — who have been characterized in the secondary literature as university-trained intellectuals — in fact had more in common with Rose’s working-classes than with the doctrinaire followers of Dietzgen within the League. Dobb and Crowther attempted to develop a Marxism that was based upon science, but was not narrowly materialistic, fatalistic, nor inflexible. They left room for human intervention in history, did not dogmatically follow Marx or Dietzgen, and — perhaps above all — realized that writing had to be understandable. Many of the elements of this eclectic and idiosyncratic Marxism will recur in the following chapters, not least Crowther’s unwillingness to maintain an unchanging political position. As we shall see, Crowther constantly found himself a man in the middle politically.

\textsuperscript{135} \textit{Plebs}, July 1923; see also Jardine, ‘Scientific Moderns’, 126.
\textsuperscript{136} \textit{Plebs}, July 1921, 204.
Because Crowther believed that Marxism had constantly to be updated in light of new scientific developments, it is difficult to disentangle whether his political or scientific commitments came first, because they shaped one another, at a time when both science and socialism were constantly changing. Crowther’s concept of scientific socialism meant that it was always evolving, the scientific shaping the political and vice versa. Indeed, what must have been his first serious encounter with the sciences of biology and psychology were in a highly political context, and here politics and science did not correspond in expected ways: this can hardly be considered an instrumental use of science to back up pre-existing beliefs. Rejected the usual underlying philosophical justification for ‘making socialists’ — the inheritance of acquired characteristics — in favour of Weismann and Mendel, a number of Plebs, including Crowther and Hogben, instead relocated their faith in environmentalism from heredity to psychology, thereby avoiding eugenics. Contrary to usual portrayals of psychoanalysis, which downplay radical interpretations, Crowther saw an understanding of instincts as crucial to liberation of himself, children and the working classes. Through propaganda and especially the methods of libertarian education, Plebs sought to stimulate the herd instinct. Perhaps uniquely amongst Plebs, Crowther developed and practised a comprehensive approach to ‘revolutionary education’ that embraced children. In the isolated commune of Tiptree, Crowther had a glimpse of humanity emancipated from capitalism’s distortions. As we shall see in the next chapter, Ivan Pavlov’s notion of conditioned reflexes, combined with the lessons of the General Strike, modified Crowther’s politics and justified his emerging career as an interpreter of science.

Though he would not have known it at the time, Crowther’s experience of ‘revolutionary education’ was profoundly significant for his career as an interpreter. The demand for up-to-date knowledge of science, expressed in clear, simple language, and of its relevance for the class war: all would feed into his interpretations of science. Over the following years, however, as hope of revolution receded, teaching in science became for Crowther a potentially powerful agent of change in itself. There were hints of this in the making of mini scientist-socialists at Tiptree, and in Jameson’s comments on the revolutionary
nature of scientific knowledge. It is to Crowther’s emergence as an interpreter of science that we now turn.
'Not a Research Scientist in the Ordinary Sense'

Given what we learnt of Crowther in the previous chapter, we might imagine that during the General Strike in May 1926, he was enthusiastically manning the barricades, clashing with police in solidarity with the locked-out miners. At the very least, we can imagine him writing for, or distributing copies of, the Trades Union Congress’s *British Worker*. In fact, Crowther did have a hand in the distribution of literature, for he could be found in the warehouse of Oxford University Press (oup), packing Bibles and other tomes. In other words, he had yielded to his employer’s demand that he strike-break. He did so reluctantly, not to defend the ‘national interest’, nor to have a ‘lark’, nor from contempt for the workers; he felt he had no choice, but hoped he could atone for his betrayal in the future. His was a distinctive experience of ‘volunteering’, the perspective of someone with a lower-middle-class occupation and working-class sympathies, that is obscured by a history that imagines a peaceful country pulling through with the help of eager volunteers.¹ The strike was a turning point for Crowther, and as I argue in this chapter, his writing on science, which he began in earnest around this time, became his life’s political work.

This chapter turns to that emerging career as an interpreter of science. It considers what models were available to Crowther in the construction of his identity and career, who he might be compared and contrasted with, and what possible sources of income existed for somebody in his position. These questions are not straightforward to answer, as Crowther tended to portray himself as a pioneer and as the inventor of scientific journalism; such a narrative tends to erase precedents and influences.² To answer these questions, this chapter explores

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² Crowther, *Fifty*, 49.
the various media markets within which Crowther attempted to earn a living. It begins by examining Crowther’s editorial role at *OUP*, before turning to periodical and newspaper publication and the *BBC*. The final section, which focuses on the publication of Ivan Pavlov’s *Conditioned Reflexes*, argues that Crowther drew on Pavlov’s theories to conceive of his writing as a form of science in action. Ultimately, practising scientists and science provided the models for his interpretations of science, and for his idea of the character of an interpreter. Crowther aimed to promote a notion of ‘rational selfhood’ that he had derived, in part, from Pearson’s *Grammar*, and that was associated with socialism and feminism. Crowther’s interpretations, based as they were on science, which was meant to be untouched by individual prejudices, were to help condition modern citizens.3

In the same year as the strike, Crowther drafted a novel entitled *Tommy Hobson*, which though never published was perhaps one of the first literary responses to the strike.4 An attempt to expose the psychology of blacklegs, Crowther laid bare his motives and the narrative of national unity told by Baldwinites. *Hobson* was a heavily autobiographical scientific *Bildungsroman*, a piece of ‘proletarian realism’ in the vein of Thomas Hardy and D.H. Lawrence, two of Crowther’s favourite authors. Like Hardy’s *Jude the Obscure* (1895), *Hobson*’s theme was impeded youthful ambitions. The titular character was clearly based on Crowther, but their paths differed in one crucial respect: Hobson gained a science degree from London University, and ended up working as a researcher for an industrial company (rather than for *OUP*). This alternative history was therefore a way for Crowther to imagine what might have been, had he gained a degree. Strangely enough, the answer seemed to be that little would have changed: Hobson went through the same experiences of radicalization, struggling, working at a progressive school and being forced to strike-break. *Hobson*, as an autobiographical piece, expressed Crowther’s personal philosophy and opinions. More importantly, the similarities between Jimmy and Tommy

pointed to a lack of individual freedom: great impersonal forces such as the capitalist mode of production, sexual desire and the class and education systems all served to determine possible careers — and responses to a strike. Modern science, Crowther seemed to be saying, was not an attractive proposition to the truly creative. But this determination of careers within science allowed the creation of a new role, that of the interpreter. In turn, the interpreter, backed by Pavlov’s theory of conditioned reflexes, could help to modify the environment and thereby determine things differently.

‘Living in the Reign of Caesar Augustus’

‘Most men’, announces a character in Hobson ‘do not have the opportunity to choose the job for which they are fitted. If they had, they would not require the money incentive to make them work.’ Lack of choice, whether due to sexual impulse, the education system or class hierarchies, is the theme of Hobson, as it must have seemed of Crowther’s life. It was all very well scraping by as a teacher at Tiptree, teaching the boys to be free, in a free environment, but what happened when they encountered the world, or when they fell in love? In order to marry Dora Amy Royle de Bude (1889/90) whom he met in April 1923, Crowther needed a more reliable source of income. His fictional self, Tommy Hobson, gained employment as a junior researcher in a private company to resolve the same dilemma; Crowther joined Oxford University Press as a travelling salesman. Crowther was now able to satisfy social conventions: three months after starting at OUP, and two days after his salary increased from £300 to £350 per annum, Crowther and Dora wed.

This union was unconventional and unlikely, and therefore fraught with worries about propriety. A school-matron and daughter of a Royal Artillery colonel, Dora was around ten years older than Crowther and had a child, Pauline, from a previous relationship, which had not been a marriage. Crowther’s

5 SxMs29/12/40/1, Hobson MS, 380.
6 SxMs29/1/2/26, 1929–30 pocket diary.
7 SxMs29/12/40/2, Hobson TS, 350–358, 370–373.
fictionalized account of their relationship suggests that a fear of social hostility motivated their marriage: if they remained unwed, they would ‘always be playing hide-and-seek in Bloomsbury or somewhere, and it will be more trouble than it is worth.’ Dora’s previously unmarried status was clearly problematic, and was kept secret. The age gap also mattered: in this period, a small variation between partners was unproblematic, particularly if the husband was older; a ten year gap — with an elder female — was more socially unacceptable, not least because it was feared that the male would eventually be unable to resist the temptations of a younger woman. Dora indeed noted that when Crowther mentioned his age people ‘naturally have a fit’. Dora and Crowther’s marriage was therefore modest: they chose witnesses who would not ask questions, and bought a wedding cake, ‘not to eat ourselves, but to send to our friends & relations to soothe them for not being asked to a proper elaborate wedding!!’ Pauline now had a step-father, and they all moved into a cottage in Rye, something that Dora had ‘pined’ for. In conceiving of their relationship and Crowther’s role, Dora drew upon chivalric conventions: she dreamt that Crowther had saved her from falling off the edge of a cliff, and though she did not ‘believe in dreams with meanings… I always do feel you’ve saved me from something.’ This unorthodox relationship apparently did not lead to discernible censure, perhaps because they married and kept Dora’s past secret.

Sexually, too, their relationship pushed at the boundaries of acceptability. While the relation between risky passionate desire and loving physical appeal was complex in this period, women’s magazines suggested that successfully controlling

8 Ibid., 420, 421. This suggests that moral respectability was still a concern, contrary to Bowler’s suggestion: Peter J. Bowler, ‘From Agnosticism to Rationalism: Evolutionary Biologists, the Rationalist Press Association, and Early Twentieth-Century Scientific Naturalism’, in Gowan Dawson and Bernard V. Lightman (eds.), Victoriana Scientific Naturalism: Community, Identity, Continuity (Chicago, 2014), 311–12, 314.
9 SxMS29/11/3/5, Dora to Crowther, Tuesday [1924].
11 SxMS29/11/3/5, Dora to Crowther, Tuesday [1924].
12 SxMS29/11/3/2, Dora to Crowther, Monday [1924].
13 SxMS29/11/3/2, Dora to Crowther, Friday [1924]; White, Huxley, 12–13.
one’s passion was essential. Predictably, the onus here fell upon women, and Dora described her difficulty keeping her emotions under control:

I feel quite wild with love for you, & it was awfully difficult yesterday to push down my feelings of passion, but I like being able to do it, because it makes me feel that the other part of my love is bigger than the sexual side.

In fact, Jimmy and Dora had already succumbed to their attraction for one another, leaving Dora reflecting on ‘What a low female I must be.’ A modern couple when it came to sex, Crowther supported birth-control — which remained controversial — and they evidently recognized the prospects, highlighted by sex theorists, for female sexual pleasure. In his 1925 speech as a potential Labour candidate, Crowther spoke of the status of women as ‘in the long run perhaps the deepest’ question to consider. Not only did women work longer than men for less pay, husbands were ‘completely egotistical… in the fundamental rites of married life’ and treated women as sexual objects rather than sexual beings. He called for sexual relations to be worked out on scientific lines ‘so that men & women can know how to behave’ and for an eight-hour day for women, to be achieved through more restaurants in cities and cheaper vacuum cleaners.

As we saw in the last chapter, in the early 1920s Crowther adopted the opinions, and the looks, of what he assumed was a working-class radical. As he later recalled, ‘I used to wear my hair about eight inches long… and my hair supported my philosophy.’ But Crowther’s proletarian dress, uncouth manner and unrefined behaviour was a threat to Dora’s vision of domestic bliss. She therefore gave Crowther a crash course in the importance of first appearances and social graces. Crowther did not ‘take off your hat enough to people’, a faux pas when meeting women, ‘when you say farewell’ and when ‘you get inside any building… Why you weren’t told all these things in your youth I can’t think.’ Dora also took the opportunity to prompt Jimmy to get a new jacket: his current

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15 SxMs29/1/5/2, Dora to Crowther, Thursday [1924].
16 SxMs29/1/5/2, Dora to Crowther, Friday 12:45 [1924].
17 Langhamer, *English*, 47–48; SxMs29/1/5/2, Dora to Crowther, Thursday [1924] and Friday 12:45 [1924].
19 SxMs29/1/3/3, 1931 CV and application for readership, 6.
raincoat made him ‘look untidy & dirty’; only workmen or mechanics wore ‘such dirty apparel.’ Her model of appropriate behaviour seems to have been the manners of a typical businessman, such as Mr. Waller, an ‘educated type’ of northerner, who had told her that manners meant more in business than anything — whereas she thought Crowther had ‘only met the working type’. For Crowther, that was probably a recommendation for keeping the rain coat, but Dora realized that ‘a first impression is the most important thing in this life’ and his appearance mattered in his new job: ‘only the wealthy... can afford to neglect their appearance, except artists.’

20 At a time when spinsters in particular pursued stability, and when marriage was a route to economic security, Dora’s concerns were understandable: in the same breath, she wondered where she and Crowther would get the money to furnish their cottage.

As a commercial traveller, employed to sell ‘books on engines, paints, etc.’, Crowther was part of the lower-middle class that expanded in the first decades of the twentieth century. However, this new-found occupation did not resolve Crowther’s social liminality, as commercial travellers inhabited an uncertain position within society. They were defined by their mobility, away from the anchor of domestic life for long periods of time, and immersed in a men’s world, subject — observers assumed — to the temptations of alcohol and prostitution. They certainly had a measure of independence, which would surely have appealed to Crowther, and their success depended upon good interpersonal skills; travellers tended to puff their ability to traverse class divisions. Crowther’s response to this occupation — typical of commercial civilization, with its middlebrow associational culture and almost complete lack of radicalism (unions were not popular) — was characteristic of someone with his politics. Whereas some commercial travellers defended their careers against a perceived decline in

20 SxMs29/11/5/2, Dora to Crowther, Thursday [1924].
22 Oxford University Press Archives (henceforth OUP) OUP/CP/ED/000819, Sisam to Fowler, 12.6.28; LeMahieu, Culture, 8, 26; the number of commercial travellers increased in the period: Michael French, ‘Commercials, Careers, and Culture: Travelling Salesmen in Britain, 1890s–1930s’, The Economic History Review, 58 (2005), 353.
23 A young Hobsbawm ‘refused all contact with the suburban petty-bourgeoisie, which I naturally regarded with contempt’: Eric Hobsbawm, Interesting Times: A Twentieth-Century Life (London, 2002), 91.
reputation after World War One, Crowther perpetuated the negative, unrefined stereotype of travellers in *Hobson*.24 Hobson’s science master, for instance, whose interest in science was now an ember, resembled one: ‘He had the rolling gait, but not the greasy fatness, the bushy moustache and baroque clothes, the confidential manner, but not the joviality of the class whose place is being usurped by Oxford graduates and Jews.’25 Crowther, then, was an outsider even in this group of outsiders: he neither belonged to the older, vulgar type of traveller, nor was he an Oxford graduate, nor Jewish.

Dora’s attempts to reform Crowther’s manners were therefore well placed, and they surely helped him to make and maintain contacts in the scientific community — a community where gentlemanly codes of conduct, that were so important to nineteenth-century men of science, had lived on into the twentieth century.26 During his work at OUP, Crowther fraternized with practising scientists at all levels, as he travelled up and down Britain. Most of these scientists were not radical, and unlikely to agree with Crowther’s politics. A comparison of Crowther with Victor Cofman, a doctor of chemistry and reporter for Science Service, is instructive. When the director of American Science Service, Watson Davis, approached A.V. Hill about obtaining British science news, the latter betrayed by ‘the expression on my face’ that he did not think highly of Cofman. ‘I am afraid the wretched man tends to bring Science Service into disrepute, at any rate among those who know what rubbish he talks. A man who behaves as he does cannot be a good judge of other people’s work’, Hill wrote to Crowther.27 Unfortunately Hill did not elaborate on Cofman’s behaviour, but Crowther agreed: Cofman possessed an ‘unfortunate personality’ that rendered him unable to cultivate personal contacts with scientists. ‘I felt certain that his peculiar behaviour [sic] would embarrass [sic] anyone cooperating with him’, so Crowther did not help

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25 *SXM29/112/30/2, Hobson TS, 236–7.
26 Chaston, ‘Gentlemanly’.
27 *SXM29/111/3/1, Hill to Crowther, 12.7.33.*
Cofman set up a British news service. Later, in 1932, Cofman’s personal manners annoyed Crowther so much ‘that I found I was unable to have anything more to do with him… he was personally very tiring.’ Crowther alluded to Cofman’s suspect politics and ‘very deep racial inferiority complex’, but the important point was that, as he reiterated to Davis, reporters needed social talent and good personal relations with scientists.\(^\text{28}\) This affective aspect of Crowther’s personal relations was crucial, and partly accounts for his later reputation amongst practising scientists.

Along with these developments, Rowse confided to his diary that ‘A change has come about in’ Crowther — ‘and I don’t altogether like it.’ He had ‘become more obviously an egoist’ and was ‘unnecessarily fastidious not only in matters of opinion but even as regards food and such mundane affairs.’\(^\text{29}\) This was on the same weekend that Crowther spoke at Rowse’s seminar group in Oxford on ‘the genius of youth is sincerity’. ‘Looking back’ from the old age of twenty-four, Crowther felt ‘that the high sincerity of youth is its genius, and it is sad when it goes and convictions evaporate.’\(^\text{30}\) It is tempting to interpret this as a lament for Crowther’s own youthful beliefs, that he saw being slowly eroded through the hypocrisy of a Marxist engaging in a petty-bourgeois occupation.

Crowther came to regard OUP as representative of all that was wrong with British culture. Though the left’s criticism of British cultural leaders — who they saw as conservative, classically trained and scientifically ignorant — was certainly on one level rhetoric, it is important to note that Crowther’s criticisms were based on personal experience.\(^\text{31}\) Oxford classicists occupied the senior positions in the Press. Humphrey Milford (1877–1952), head of the London branch, and John Johnson (1882–1956), printer to the Press from 1925, were both privately educated and studied classics and \textit{literae humaniores} at Oxford; Milford was also

\(^{28}\) SxMs29/113/1, Crowther to Davis, 18.7.33.

\(^{29}\) EUL MS113/2/1/4, entry dated Monday 26.5.24.

\(^{30}\) SxMs29/118/8, notes on ‘the genius of youth is sincerity’ [May 1924].

fond of firing off questions in Latin when interviewing job applicants.\textsuperscript{32} And, though OUP was described as ‘the world’s pre-eminent publishing house’ in the year that Crowther joined, most were agreed that this pre-eminence did not extend to its science list, which was seen as outdated.\textsuperscript{33} In fact, OUP had published some important science titles, such as J. Clerk Maxwell’s \textit{A Treatise on Electricity and Magnetism} (1873) and J.J. Thomson’s \textit{Notes on Recent Researches in Electricity and Magnetism} (1893), the latter a sequel to the former. In the early years of the 1900s, \textit{Lectures on the Method of Science} (1906), edited by T.B. Strong and with contributions from C.S. Sherrington and William McDougall, had appeared. Charles Singer also edited the two volume \textit{Studies in the History and Method of Science} (1917, 1921).\textsuperscript{34} The early 1920s saw efforts to produce better books on general science (before then it was stronger in medicine): in 1923, for example, the Clarendon Science Series for Schools was established, edited by Julian Huxley and D.M. Hammick, both Oxford scholars. But between 1923 and 1935 only five titles were published in this series, including D.R. Pye’s \textit{Heat and Energy} (1923), Frederick Keeble’s \textit{Life of Plants} (1926), and Huxley and J.B.S. Haldane’s \textit{Animal Biology} (1927), the last of these aimed at ‘the general public who are desirous of knowing something of the achievements and outlook of science, and who want something more solid and more continuous than is the bulk of popular scientific literature.’\textsuperscript{35} Though the Clarendon Science Series was an indication of the Press’s willingness to increase its science output, it generally remained weak.

Where Tommy Hobson exploits his limited degree of autonomy at the Anglo-Universal Electrical Machinery Company to order expensive equipment, Crowther exploited his by commissioning new books. In doing so, he caused


\textsuperscript{34} I identified these books with the help of the OUP’s Annual List of Titles, available at http://global.oup.com/uk/archives/reference.html (accessed 22 September 2014).

problems for Milford and irritated Nevil Sidgwick (1873–1952), an Oxford chemist and Delegate to the Press.\textsuperscript{36} For example, with Crowther’s encouragement A.E.C. Smith had sent his Elements of Physical Chemistry to \textit{oup}, whereupon its readers found it ‘to be very bad indeed.’ Sidgwick was ‘most emphatic about its poor quality and its longwindedness’ and they concluded that the book ‘must clearly be ploughed.’ Though they were not committed to the book, the Press had ‘gone nearer to it’ than Milford liked.\textsuperscript{37} He reprimanded Crowther for almost commissioning the book ‘on the strength of a few chapters and in the face of a lukewarm report’; Crowther needed to be sure of his ground before giving ‘too much general or special encouragement to books on general science’.\textsuperscript{38} But Crowther was ‘indefatigable’ according to Kenneth Sisam (1887–1971), Assistant Secretary.\textsuperscript{39} When W.A. Wooster, a demonstrator at Cambridge in crystal structure, sent in a book proposal, Sidgwick was

\begin{quote}
a good deal troubled to hear that Crowther has been at work at Cambridge again. I thought we had stopped that. He never was regarded favourably at Cambridge, and now he gets us a bad reputation by making wild offers to all sorts of people, & some times as you know lets us in for trouble that takes some straightening out.\textsuperscript{40}
\end{quote}

It is not clear what Sidgwick was referring to here: he was referring to Cambridge University, rather than Cambridge University Press, but he did not reveal who regarded Crowther unfavourably, nor whether the ‘never’ went back to his undergraduate days. What is clear is that Sidgwick was concerned about maintaining the standards of \textit{oup} publications, which meant not making unrestrained offers to ‘all sorts of people’. He was also specifically worried about relations between \textit{oup} and Cambridge (both the Press and the University); dealings with them ‘need some tact’, but Sidgwick, well known for his acidity, judged that Crowther had ‘neither knowledge nor sense’.\textsuperscript{41} Perhaps Sidgwick was nettled because Crowther seemed to solicit Cambridge scientists on behalf of the

\begin{footnotes}
\textsuperscript{37} \textit{oup}, Milford’s Letter Book vol. 121, Milford to Meredith, 17.11.25 (p. 220) and 19.11.25 (p. 256).
\textsuperscript{38} \textit{oup}, Milford’s Letter Book vol. 121, Milford to Crowther, 19.11.25 (p. 264).
\textsuperscript{39} \textit{oup/cp/ed/000819}, Sisam to R.H. Fowler, 5.6.28.
\textsuperscript{40} \textit{oup/cp/ed/000819}, Sidgwick to Sisam, 31.10.28.
\end{footnotes}
Oxford Press: Sidgwick took pride from, and promoted, Oxford’s chemistry, noting ‘that if someone in Cambridge lit a Bunsen burner it was national news while if someone in Oxford isolated a new element it would be ignored by the press.’ Sidgwick agreed that Crowther ‘must be kept quiet — he lets me in for lots of rebuffs, and you too must feel the draught when you visit Cambridge.’

Though undoubtedly a nuisance, Sisam understood that Crowther’s ‘interests lead him further afield’ than technical books, and ‘sometimes with happy results.’ Crowther had a hand in some of the Press’s more significant coups, and it seems likely that Milford and Sisam were unwilling to dismiss Crowther because his over-enthusiasm occasionally paid off. He secured a translation of Pavlov’s *Conditioned Reflexes* for the Press, and managed to convince Eddington to write *Stars and Atoms* (1927). Eddington’s book sold well, and Sisam subsequently regarded Eddington as a desirable author. In the same year, Crowther encouraged the Cambridge physicists R.H. Fowler and Peter Kapitza to approach the Press about a series of physics monographs, which appeared as the International Series of Monographs on Physics. The first title in the series was *The Principles of Quantum Mechanics* (1930) by P.A.M. Dirac (another Cambridge physicist) — the Press was pleased to have published the influential volume, notwithstanding its difficulty to comprehend. Crowther told Rowse in 1927 that *Stars and Atoms* had sold 3,600 copies in four months, and that Pavlov had sold 200 in one month, ‘& the best part of the year is coming, so the Press can’t complain and be in their senses.’ Relations between Crowther and the Press remained fraught, but many of the titles published under Crowther’s prodding undoubtedly helped to promote science and improve the reputation of the Press’s science list.

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43 oup/cp/ed/000819, Sisam to Sidgwick, 1.11.28.
44 oup/cp/ed/000819, Sisam to Fowler, 12.6.28.
45 oup, Milford’s Letter Book vol. 131, Crowther to Milford, 8.12.28 and Milford to Crowther, 12.12.28.
47 Bell, ‘Scholarly’, 380.
48 eul ms113/3/1/c, Crowther to Rowse, 8.9.27.
Even within science, Tommy Hobson argued, the system militated against creativity, in favour of the unimaginative and conservative products of Oxbridge. As in Wells’s realist *Bidungsromans*, the characters in *Hobson* are hampered by the world in which they live.⁴⁹ Hence Crowther shows how Hobson’s natural inspiration is slowly imprisoned by the education system: at home, he started experimenting in the wash-house, but what he did at school seemed to have ‘no connection’ with these lively experiments.

Science at school was a subject, on the same status as any other subject. If you swotted at it, there was a prize at the end of the year, and masters smiled on you. Perhaps it was an item in the list of subjects for an examination such as the School Certificate or London Matriculation, affairs which are very far removed from wash-houses. Madame Curie made her discovery of radium in a wash-house. She did her fractional distillations in a disused copper.

Hobson comes to detest precisely those academically successful students, his peers at University College who know more than he does but are nevertheless fully imprisoned — like classicists. Their captivity is represented by their conservatism and their ignorance of everything but science, and Hobson’s instinctive dislike of them causes him to join the University Socialist Federation. These activities mean that Hobson attains a second-class degree, and is forced into teaching and an industrial research firm, but he nevertheless is portrayed as more brilliant than his peers.⁵⁰

This all added up to a romanticization of the old, wash-house style of scientific research, and criticism of the newer, corporatist trends.⁵¹ The gentlemanly, amateurish and absent-minded scientist was a persistent trope in nineteenth and twentieth century literature, from H.G. Wells’s *Island of Doctor Moreau* (1896) to J.B.S. Haldane’s *My Friend Mr Leakey* (1937).⁵² But whereas in these portrayals, men of science put their talents to magical, sometimes nefarious

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⁵¹ For the overlap between industrial and academic research in this period, see Jeff Hughes, ‘Plasticine and Valves: Industry, Instrumentation and the Emergence of Nuclear Physics’, in Jean-Paul Gaudillière and Ilana Löwy (eds.), *The Invisible Industrialist: Manufactures and the Production of Scientific Knowledge* (Basingstoke, 1998).
ends, the researchers in Hobson’s industrial research firm are simply keeping up appearances. The Anglo-Universal Electrical Machinery Company tasks Hobson with inventing gas lighting. He ‘beavered away’ at his task, with no contact with other researchers; he only makes an acquaintance after bumping into a colleague at the weekend. Both agree that their work is nonsense: because the business makes profit, there is no incentive to do worthwhile work.\textsuperscript{53} If one’s creative spark had not been whittled away by the education system, then, it seemed unlikely to survive the senseless work of an industrial laboratory — or, indeed, flogging outdated books. Despite the odds, however, Hobson does make a discovery: that the brightness of a lamp could be increased by placing radium near the filament (that Marie Curie discovered radium links this discovery back to Hobson’s early wash-house experiments; it has little to do with his formal training). The company rejects the bulb, on grounds of expense. Hobson therefore works, at the risk of losing his job, on the theoretical implications of his discovery, and therefore on establishing his scientific reputation.\textsuperscript{54} Then, the strike intervenes.

The strike highlighted, for Tommy as for Jimmy, their almost classless position. When Hobson is ‘politely’ asked to blackleg by his manager, a man ‘with a fetching oily grin’, Hobson is forced to think ‘furiously’. His wife ‘would not be home until to-night,’ so he could not ask ‘whether she minded him risking his job by refusing to blackleg. In the circumstances, he decided to “rat”, hoping that the future would give him an opportunity for repaying with interest the debt on his principles.’\textsuperscript{55} In solidarity with the strikers in theory if not in practice, Hobson observed his fellow scabs, divisible into ‘genuine labourers, non-unionist on principle and disagreeing with strikes as such’, ‘non-unionists whose wives or mothers had not allowed them to strike’, and ‘bum-suckers and opportunists who had stayed in to get on the right side of the boss.’\textsuperscript{56} His colleagues in the research department ‘were black-legging for all they were worth, being amongst the loudest whistlers, squirts and hail-fellow-well-met loyalists of all the scabs in the

\begin{footnotes}
\item[53] SxMs29/12/40/1, Hobson ms, 402, 403, 405–409.
\item[54] SxMs29/12/39/5, Hobson ts, 575–580.
\item[55] SxMs29/12/39/5, misfiled Hobson ts, 594.
\item[56] Ibid., 597–598.
\end{footnotes}
fitting shop.\textsuperscript{57} Three weeks of this causes depression, which results in the management threatening to dismiss Hobson for ‘not chirp[ing] like a sparrow while black-legging’.\textsuperscript{58} At least he was not working under ‘public school men’ who lacked a scientific training (as was Crowther), which Hobson imagined would be like ‘living in the reign of Caesar Augustus, only with more Augustus and less Caesar.’\textsuperscript{59} In invoking Augustus, Crowther also invoked Italian fascism, which looked to Augustan Italy as encapsulating authority and order. ‘The Classics are the very bread of elegant prison-life’, Hobson asserts, which provide ‘acuteness of mind, but no sense of values’. Study of ancient history alone created, somewhat contradictorily, a ‘dead mind, beautiful in its construction like the shell of a protozoon cut from a piece of chalk and just as sterile.’ A scientific training, conversely, provided principles and standards of behaviour: ‘I’m coming to the conclusion that an educated man cannot be honest unless he’s had a scientific training.’ The venom against Crowther’s superiors is palpable. But, significantly, Hobson’s researcher colleagues enthusiastically blacklegged, and they were more dreadful, because they should know better: a scientist ‘blind to scientific inspiration except in his own little field of enquiry’, who ‘lapses into classicism in his attitude towards the ordinary affairs of life’, was ‘more pathetic still’. Such scientists signed ‘manifestos during times of war declaring that German science is “nth rate”… You can scratch a Cambridge engineering graduate and still find an abbott!’\textsuperscript{60} Classicism for Crowther, then, was a failure to extend the scientific inspiration into other aspects of life; a narrowly-trained engineer could succumb just as easily as those who studied Greek and Latin — that was why the public had to be able to assess the claims of experts.

Six months after the strike ends, Hobson is sacked, and he wonders: ‘How can one be creative when living in the atmosphere of medævalism? I should have no more chance to do anything really worth while than had Roger Bacon in the thirteenth century.’\textsuperscript{61} But he remains cheerful, and in leaving his job he attains

\textsuperscript{57} SxMs29/12/39/5, Hobson ts, 601–602.
\textsuperscript{58} Ibid., 603–605.
\textsuperscript{59} Ibid., 608.
\textsuperscript{60} Ibid., 614. For the swift disintegration of scientific internationalism in 1914, see MacLeod, ‘Scientists’, 439–442.
\textsuperscript{61} SxMs29/12/39/5, Hobson ts, 614.
emotional satisfaction — his wife dutifully supports him, and he loves her more than ever, despite his uncertain future. He decides to meet with his old tutor from university, who ‘didn’t know anything about the [Anglo-Universal’s] internal workings, nor had he heard of [Hobson’s] radium lamp discovery.’ With this, the unfinished novel ends. Crowther, by contrast, stayed at the OUP. Being forced to blackleg confirmed his opinion that the atmosphere of medievalism needed to be combatted: people — scientists included — needed to extend the scientific method to everyday life and allow it to guide their principles.

Crowther seemed happy to leave research to the abbots in scientists’ attire. He portrayed modern science as an uncreative petty-bourgeois pursuit, not unlike commercial travelling. The argument that capitalism frustrated science — due to a lack of legitimate purpose, coordination and cooperation — would be one of Crowther’s (and others’) refrains in the coming years. And yet Hobson, an exceptional, driven individual, could push at the boundaries of society’s constraints. Could Crowther?

Serial Publication

Crowther, then, preferred (perhaps making a virtue of necessity) not to be a research scientist — the days of creative wash-house experiments had long gone, he thought, to be replaced by a determined career of petty-bourgeois drudgery. However, he resolved to create a new role for himself, that of the interpreter, which would allow Crowther to communicate in ways that he felt the research scientist could not.

When Crowther began submitting scientific articles to the press, many potential models for an interpreter of science existed. He later claimed to have been inspired to begin writing after one of his research scientist friends mentioned doing so, and many practising scientists were willing to write for the press — though they were in the minority. Crowther may have looked, for example, to the

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62 SxMs29/12/40/1, Hobson ms, 465.
zoologist E. Ray Lankester, who had written from his easy chair for the *Daily Telegraph* before World War 1, or to the biologists J. Arthur Thomson (*Glasgow Herald*) and Peter Chalmers Mitchell (who wrote for the *Times*, supplementing his income from examining and teaching). There were also those two rising biologists, J.B.S. Haldane and Julian Huxley, both of whom came from the intellectual purple, the former of whom had written for at least fifteen different periodicals by 1927. Then there were those who came to write about science from a different angle, beginning their careers as writers. Wells was the most prominent of this group. Though Crowther is often paired with Ritchie Calder, he was not yet on the scene. J.W.N. Sullivan, who left school early before working for a telegraph company and then dropped out of University College, London, probably serves as the most appropriate figure of comparison for Crowther, at least socially. But even he was a journalist before he turned out his widely respected interpretations of Einstein’s theory of relativity in 1919. Sullivan also contributed articles to the left-wing *Daily Herald* in the early 1920s, which Crowther undoubtedly read. Crowther surely learnt from these writers, though he did not acknowledge his debt at the time, and would later distance himself from them (as we shall see).

Crowther’s models came from surprising directions and captured the uniqueness of his role. Unlike the writers mentioned above, Crowther was neither writer nor research scientist, but commercial traveller. There were similarities between the commercial traveller and the flâneur — the ‘man about town’ who dispassionately observed his surroundings, perhaps recording them for art or posterity’s sake. Even though the traveller (unlike the flâneur) has to work, it seemed quite a palatable self-image for Crowther. He admired such writers as

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George Moore (1852–1933), whose *Confessions of a Young Man* (1888) described life spent as a striving artist in Paris, Crowther felt Moore was ‘one of the few great men still not respectable — unlike Shaw’, as he told Rowse.

Crowther used Moore’s *Confessions* as a conceit in an article entitled ‘The Formula’, which appeared on the back page of the *Manchester Guardian* in May 1928. The article began with Crowther buying a copy of Moore’s book ‘to wile away the hours of the journey from Edinburgh to London’. The title of the article referred to Moore’s ‘instinctive tendency to analyse his surroundings [which] he reinforced by habitual application.’ Crowther then applied this ‘formula’ to another passenger. Crowther’s fascination with extracting articles from observations of everyday life is instructive. That Crowther described the technique as a formula suggests a scientific approach to ‘article-mongering’, and he applied the same ‘formula’ to his articles on science: he became, as it were, a flâneur of the scientific world, interpreting the latest discoveries direct from laboratories. This was not a role that a research scientist could easily perform, as most of their time was presumably spent in their own laboratories; Crowther had an excuse to visit laboratories of different disciplines as a representative of OUP.

This was also an identity that was congruous with the role of a reporter, who was increasingly meant to be close to the action. Reporting from the scene was just one of many changes that journalism had witnessed over the past forty years or so, that were beneficial to someone in Crowther’s position. Developments in print technology allowed for cheaper production and pictures, which increased circulation and thus widened readerships, allowing new forms of journalism to emerge: ‘women’s interest’ columns, human interest stories and an informal, concise style. These developments created a demand for articles and reviews, and by the 1890s it was possible — though difficult — to make a living from

68 For the similarities between commercial travellers and the flâneur, see Popp and French, ‘Practically the Uniform of the Tribe’, 459, 461–463.
69 EUL MS I 3/31/1C, Crowther to Rowse, 7.2.28.
70 *Manchester Guardian* (henceforth *MG*), 16.5.28, 20.
71 Colls, *Orwell*, 82.
Meanwhile, journalists debated whether they belonged to a profession. The Institute of Journalists and National Union of Journalists were formed, but these were not associated with narrowed entrance requirements. Whilst many recognized that professionalism meant better social status and pay, most objected to examinations, as they did not want to create a “closed shop”, which would have conflicted with the romantic notion that journalism was a career open to those with humble origins and a wide general knowledge. Though university-educated journalists were becoming more prominent, journalism remained, to a large extent, a fluid career.

There were, however, potential drawbacks for research scientists willing to make the most of this fluidity, which left an opening for Crowther to fill. This is best illuminated by the problems experienced by Julian Huxley in the early 1920s. After the Daily Mail reported in 1921 that Huxley had ‘discovered the Elixir of Life’, his colleague Francis Crew noted that some scientists remained ‘suspicious of’ Huxley, whose letter had failed to quieten the press. Association with journalism could be seen as a taint because wider readerships and the new forms of journalism resulted in accusations that the British press had become Americanized and sensational: it was no longer a vehicle of cultural uplift; it reflected, rather than shaped, public opinion. Over the following years, as Steindór Eriingsson shows, Huxley’s reputation as a researcher suffered. His peers suspected that he did not devote enough time to scientific research: he was spreading himself too thin. According to Crew, Huxley had ‘rebelled’ against ‘accepted fragmentation’ — by which he meant specialization — and his critics thought he should confine himself to ‘Biology or Literature or lecturer and writer

of interpretive styles but not a mixture.’

One could not, in other words, hope to be a respected researcher and have enough time to devote oneself to poetry, or lecturing and interpreting.

Though Erlingsson shows that there were costs to being a restless intellect, Crowther’s case suggests that interpreters were valued by the scientific community: specialization was not as accepted as Crew thought. In this period, worries about specialization were ordinarily confined to the supposed distance between the arts and sciences, but there also existed a recognition of a growing and problematic gap between the different branches of science.

In his 1921 BAAS Presidential address to the Conference of Delegates of Corresponding Societies (which represented local scientific societies and societies that encouraged study of science), for example, Richard Gregory said that specialization was essential, ‘but the price which has to be paid for it is loss of contact with the general body of knowledge.’ He portrayed this separation as a natural consequence of concentration upon a single subject, which ‘tends to make people indifferent to the aims and work of others’. He called for ‘champions and advocates’ of science, ‘in addition to actual makers of new knowledge and exponents of it.’ Because science had become detailed and complex, and special knowledge was required to understand the subtleties and ideas,

very special aptitude is required to present it in such a way as will awaken the interest of people familiar only with the vocabulary of everyday life. In the scientific world the way to distinction is discovery, and not exposition, and rarely are the two faculties combined.

(Fifteen years later, Hopkins was to echo these sentiments almost word-for-word, as we saw in the introduction.) The intellectual division of labour had created a need for interpreters of science, but it also made their jobs much more difficult than in the nineteenth century. There was, then, a recognition that somebody needed to do Crowther’s job, and the pages of Nature — an influential forum through which the scientific community defined itself and debated the issues it considered most important — in the interwar period were littered with mentions

78 Collini, Absent, 456–457.
of specialization and its attendant dangers. As we shall see, Crowther consistently attempted to derive his authority as a generalist by appealing to the perils of overspecialization.

What sources of income were available to Crowther in filling this role? Here, there was less difference between Crowther and scientist-interpreters than we might assume, at least initially. According to H.G. Wells, in 1928 a research scientist could reasonably expect to receive up to £400 for a single article of 1,000–1,500 words for the daily or weekly press, assuming the article was ‘well written, clearly, simply, and with an understanding not only of the subject, but of the alert but uninstructed (or badly instructed) lay intelligence.’ However, when C.P. Scott, editor of the Manchester Guardian, approached Julian Huxley — ‘as the representative of a great name’ — to submit a series of articles on evolution in light of the Scopes Trial in 1925, Scott offered Huxley six guineas per article of 1,000–1,200 words, nowhere near Wells’s dizzy sums. Crowther received less than Huxley from the Guardian, though not much. Initially, he received four guineas per column, sometimes five ‘by arrangement for special reasons.’ The Nation and Athenaeum also initially paid Haldane five guineas, though he soon demanded prices ‘too steep’ for the editor, Leonard Woolf. In 1927, Crowther told Rowse that he had ‘averaged about £5.5 a month for the last six months between the New Statesman and the Manchester Guardian, which is something, but little more!’ This was only achieved by writing in spare moments — on trains, in hotel rooms, in the evenings — so that life was ‘strenuous trying to write articles on top of travelling & my job.’

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80 The Scientific Worker, June 1928, 61.
81 Manchester Guardian Archive, John Rylands Library, Editor’s Correspondence (henceforth MGA), A/H109/2, Scott to Huxley, 22.7.25.
82 MGA A/C105/17, memo dated 22.11.29.
83 Haldane Papers, University College London (henceforth Haldane), Haldane/5/2/5/28, Haldane to Waddington, 24.11.41; SxMs29/1/6/2, notes on Leonard Woolf, 25.1.26.
84 eul Ms13/3/1/c, Crowther to Rowse, 28.2.27.
85 SxMs29/9/2/4, Crowther to Huxley, 6.8.29.
Gerald Barry (who had given Crowther three guineas for an article on planning).\textsuperscript{86}

Crowther received similar remuneration to the likes of Haldane and Huxley because, to those within the \textit{Manchester Guardian}, Crowther was ‘A scientist on the staff of the Clarendon Press’.\textsuperscript{87} While this may simply have referred to Crowther’s main interest, it is clear that Huxley’s name rather than his expertise played into the \textit{Guardian’s} offer to pay him slightly more for his columns. In fact, receiving payment for scientific articles could be viewed with suspicion, as hard cash could act as a less virtuous motivator than a disinterested love of truth — a reminder of the persistence of the nineteenth-century ideal of the gentleman, who did not need payment. ‘I am sure’, the biochemist Joseph Needham wrote to C.K. Ogden in 1926, that ‘if... journals to which I contribute paid for papers, there would be a lot of skilfully disguised rubbish sent in, perhaps even researches which had never been done at all!’\textsuperscript{88} Clearly, Needham referred to specialized journals, but he was criticizing Ogden’s policy for \textit{Psyche}, a journal that published interpretative essays and paid contributors a mere £1 per 1,000 words (and some contributors withdrew their papers because Ogden did not pay enough).\textsuperscript{89} Without a salary for scientific research, Crowther could not afford to write articles with no remuneration, but he also had to avoid writing ‘skilfully disguised rubbish’ for fear of being charged with writing merely for money. ‘News paragraphs and articles on scientific matters’, unlike those on politics, ‘have to be reasonably accurate... [which] depends on organized checking’, he later wrote.\textsuperscript{90} This often began by asking practising scientists where he could find out more about their research; having drafted an article or talk, Crowther often asked researchers to check it was ‘free from howlers’.\textsuperscript{91}

\textsuperscript{86} SxMs\textsuperscript{29}/6/2, Crowther to Barry, 31.12.31.
\textsuperscript{87} MGA, A/C105/1, filecard on Crowther dated July 1927 (my emphasis).
\textsuperscript{88} Quoted in Charlotte Sleigh, \textit{Six Legs Better: A Cultural History of Myrmecology} (Baltimore, 2007), 143.
\textsuperscript{89} Ibid., 265 n.13.
\textsuperscript{91} Royal Society of London Library, Miscellaneous Manuscripts, MM/22/46, Wilson to Crowther, 1.10.25; SxMs\textsuperscript{29}/1/3/1, Crowther to J.A. Crowther, 27.1.29.
Perhaps more than anything, the revolutionary motivations that underlay Crowther’s writing distinguished him from the likes of Huxley. In 1925, Crowther approached Huxley about creating a ‘semi-official journal whose business it is to expound the significance of new scientific work to the general public.’ A collaboration between the BAAS and OUP, the journal, he said confidentially, ‘would be conducted so that it would be acceptable to the WEA and other serious minded socialist student movements.’ The stink of socialism evidently spooked Huxley, and Crowther reassured him that it would not ‘be an ILP broad-sheet!’ The journal Discovery had failed (sales had slipped from 18,000 copies in 1920 to 4,000 in 1923), Crowther said, because it had no interest in ‘where the scientific civilisation of today is going.’ He also asked Huxley if he would be more comfortable thinking in terms of “social outlook” if one feels nervous about “political outlook.” This can be interpreted as a shrewd attempt on Crowther’s part to appeal to Huxley’s belief in social progress. Yet despite a common belief in both ‘community’ and progressive evolution towards ‘individuality’ of both person and collective, no collaboration proved possible.92

The principle underlying Crowther’s interpreting went beyond ‘social outlook’: in an undated, and apparently unpublished, manuscript on ‘Science and the Press’, he admitted that he aimed to stoke up class conflict and presumably cause revolution.93 A heightening ‘of the scientific attitude in the public would increase the intensity of the class-war.’ As people learnt ‘more facts concerning society the public annoyance with present social disorder would increase and the class-war would be intensified.’ An example of such a fact was the nature of the class war itself, which people incorrectly regarded ‘as a simple function of two variables b & p’ (bourgeoisie and proletariat). Because it had been represented as a simplistic battle between two opposing forces, intelligent people like Wells dismissed Marxist sociology. Crowther’s social experience, though he did not mention it, had alerted him to the fine gradations in class that were not

92 JHP, Box 8, Crowther to Huxley, 1.4.25 and 6.4.25; for sales of Discovery, see Bowler, Science, 176; Roger Smith, ‘Biology and Values in Interwar Britain: C.S. Sherrington, Julian Huxley and the Vision of Progress’, Past & Present, 178 (2003), 226–230.
93 This was possibly read at a meeting of the Tots and Quots, around the end of 1932: see Solly Zuckerman, From Apes to Warlords: The Autobiography (1904–1946) of Solly Zuckerman (London, 1978).
acknowledged in Marx’s original theory. Rather than discrediting the class war, however, expansion of the ‘new’ middle class complicated it. People needed to see class war as

a complicated function of $n$ variables $u$, where $u$ represents the unskilled workmen, $s$, where $s$ represents skilled workmen, $t$, where $t$ represents technicians, $f$, where $f$ represents financiers, etc. This complicated function of $u, s, t, f$, etc. may be the motive of social history and the most fundamental thing in sociology.

This truth, as Crowther saw it, ‘may be spread among the public by scientific articles containing palatable examples of the mathematical notion of a function. An intelligent exposition of social statistics might increase the public knowledge of this simple & powerful idea.’ The crucial word here was ‘palatable’: methods of scientific thinking were not necessarily to be imparted in direct reference to their application to society (especially when it came to as incendiary a topic as class-war) — the inference would be made by the audience.

We will turn to issues of style and form in the next chapter; for now, we need only note that Crowther’s early articles attempted to encourage readers to arrive at conclusions analytically. For example, he advised on whether to use coal, gas or electricity to heat houses, by analysing the costs and the type, and effects, of the heat provided. Where once humanity used ‘to be prostrate and helpless in face of’ hurricanes, they now ‘observe them coolly and carefully’ — except, of course, the capitalists who speculated on real estate in Miami, which lay in the path of West Indian hurricanes: ‘The business man’s contempt for theory has shown up rather badly here.’ A colossal amount of money and human suffering could have been saved, had investors known a little meteorology. Readers were presumably meant to reject capitalism on this basis. Crowther therefore had a certain degree of faith in the public’s intelligence, and its ability to apply the scientific method to social affairs. Indeed, he staked the revolution on the slow permeation of the scientific method throughout society. Though not explicit, Crowther’s belief that learning in one domain — science — could be applied in other areas — society —

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94 Colls, Orwell, 112.
95 SxMs29/9/11/6, ‘Science and the Press’ MS, 16–19.
96 New Statesman, 12.3.27.
rested on the notion of transfer of learning. Though this idea — that learning could be carried, thanks to the inculcation of general reasoning skills, from one context to another — was being questioned in this period, Crowther would have been aware of the theory from his educationist days.98

Figure 2: Crowther’s ‘scientific correspondent’ articles in the Manchester Guardian, 1926–1945. Crowther maintained an impressive output (he averaged over 30 articles per year between 1930 and 1939), especially when one considers that he contributed other articles to the Guardian under his own name and completely anonymously; that the editors rejected some articles; that he wrote for other journals; that he published many books; and that he also worked for OUP.

The Manchester Guardian, the outlet through which Crowther was most active, would seem an unpropitious channel through which to create this scientifically informed populace (fig. 2). Progressive, but not radical, it had opposed the Boer and First World Wars, supported women’s suffrage and disapproved of British intervention in the Russian Civil War.99 In terms of readership, a mass paper such as the Daily Express achieved ten times that of the Guardian.100 However, in other respects, the Guardian was a promising conduit for Crowther’s agenda. Scott, the owner-editor, was dedicated to the nineteenth-

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98 Michelle Hoffman, ‘Science Education, Clear Thinking, and the Problem of Transfer’ (Swansea University, 2015).
100 Beers, Your Britain, 16.
century educative model of the press — increasingly a minority stance — whereby newspapers formed, rather than reflected, public opinion. And the *Guardian* had the potential to reach a wide audience. It cost twopence, a price within the reach of workers; advocates of independent working-class education also regarded it as fairer and more honest than other bourgeois newspapers. E. Smedley, a coal miner from Hucknall, Nottinghamshire, certainly thought the paper was worth buying. Smedley, like all miners, had ‘been working poor time for a long time’ but was ‘having 10 days holiday!’ when he wrote to Crowther in 1928. Smedley had enjoyed Crowther’s article on smashing atoms, and told Crowther how ‘surprised’ he was ‘to find that there were some anti-science folk’ at an adult Sunday school he attended. ‘Science, we were told, was never to be relied upon! What science proves to day will unprove tomorrow! There is no certainty in science — a scientist cannot prove anything!’ Eager to learn, Smedley divided the little free time he had between gardening and reading, but getting the books he saw ‘mentioned in papers & magazines’ was ‘out of the question.’ Instead, he was ‘always on the look-out for science articles in newspapers’. Enthusiastic, autodidact workers like Smedley were surely in a minority, but they relied upon Crowther’s articles to satisfy their desire for scientific information. Receiving such letters must have reassured Crowther that his articles were worthwhile, and possibly led him to believe that they were more widely read by the working classes than was in fact the case.

Given his educational aims, we would also expect to find Crowther exploiting the opportunities provided by the BBC in this period. John Reith’s vision of broadcasting as a means of public education and cultural uplift, set out in *Broadcast Over Britain* (1924) and elsewhere, was certainly in harness with Crowther’s intentions. And he would have welcomed the Company’s evolution

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102 *Plebs*, May 1921, 159.
103 SxMs29/9/2/2, Smedley to Crowther, 12.4.28.
into a public corporation, as did others on the left. At the same time, many in the Labour movement resented the BBC for its conduct during the General Strike, when it muffled the workers’ point of view. This did not preclude Crowther’s involvement, however, because he tried to ingratiate himself with the BBC between 1925 and 1928. He proposed a science page for the *Radio Times*, and delivered some ‘Stars of the Month’ talks in 1927 and 1928. The details of Crowther’s involvement with the BBC have been recounted elsewhere. Here, I want to highlight Crowther’s professed uneasiness about broadcasting, which other historians have overlooked. Crowther’s first talk received criticism, and the producer Hilda Matheson was less than pleased with his delivery. Crowther was aware of the abuse, wondering after his second broadcast ‘what sort of criticism I shall receive this time.’ For Crowther, the criticism combined with the subsequent dropping of the ‘Stars of the Month’ slot was significant, and perhaps prompted him later to cast the radio as a tool of totalitarianism (see chapter 5). But he also had a more practical objection to the medium: listeners could not easily revisit talks, and so they might miss information or not fully understand what was said. Indeed, at least one listener wrote to Crowther asking for details that he had missed or forgotten from a broadcast. Crowther therefore had fundamental doubts about the virtue of broadcasting as a vehicle for public education. Thus Crowther could not adjust to the new technology and had little involvement in the single most significant media innovation of the interwar period.

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108 EUL MS115/3/1/c, Crowther to Rowse, 7.2.28.
109 SxMs29/9/10/5, Reginald Jennings to Crowther, 12.1.28. See also letter from ‘a listener’ dated 2.1.28.
Conditioning Reflexes

Though Crowther was a freelance journalist, he seemingly did not self-identify as belonging to that profession. He was not, for example, a member of the National Union of Journalists. When his guard was down, he tended to portray himself more as a scientist than a journalist, and his interpretations as science in action. Take, for example, his speech at the Mendeleev Conference in Kharkov in 1932, an event for chemists, on ‘The Exposition of Science to the General Reader, or The Problem of Scientific Journalism’. Crowther was the only British delegate to be invited to the conference; he was presented with a set of photos and taken on a trip to the recently completed Dnieper Dam. Perhaps because the USSR valued the exposition of science highly as a precondition for success of the Five Year Plan, and perhaps because Crowther was away from the gaze of those British men of science with whom he had to tread carefully, Crowther began by describing himself as ‘not a research scientist in the ordinary sense’, implying that he was a research scientist in some sense. He went on to explain that

> The spread of scientific knowledge & the scientific temper in capitalist countries is a powerful agent of social progress... I believe that the demand for a scientific treatment of social problems must inevitably cause a demand for socialism, because socialism is the scientific method of organizing society.\(^{111}\)

Elsewhere, Crowther made an analogy between the practices involved in scientific research, and those involved in scientific journalism. Both involved research, albeit of different kinds. Here again we see the mark of Pearson, who argued that there was no limit to science’s reach. In this section, I suggest that Crowther saw his own writing as an application of the research of Pavlov, which Crowther interpreted as proof that human nature could be moulded through reading. Conditioned reflexes acted as Lamarckism by other means for some on the Left, as they provided experimental justification for the transformative power of the environment.

\(^{110}\) See *Science*, 17.3.33, 286 for a report of the conference.

\(^{111}\) SxMs29/12/41/24, ‘The Exposition of Science to the General Reader’ TS, 1932, 1.
Before the translation of *Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex* in 1927, Pavlov’s work was relatively unknown in Britain. Crowther secured the book for OUP, and interpreted it in various journals around the time of its publication. Though it is unclear precisely how Crowther convinced the various parties to publish *Conditioned Reflexes* with OUP, he raised the idea with Gleb Anrep (1891–1955), physiologist at University College London who had worked with Pavlov. Crowther stereotyped Anrep as ‘the temperamental Russian. Sensitive, brutal, gentlemanly, treacherous, brilliant, lacking in character. He is small and moody’. During the Russian Revolution, Anrep fought against the Bolsheviks and, after their victory, came to England. He delivered lectures in Britain and the United States on conditioned reflexes in 1924; such were their popularity that he was asked to write a book on the topic. This forced Pavlov’s hand (as he was reluctant to publish). Pavlov subsequently wrote a monograph, which was sent to Anrep for translation between August 1925 and May 1926; the Royal Society funded the work.

*Conditioned Reflexes* appeared in 1927 to favourable reviews, but it was not an easy book to read and, at a costly 28 shillings, most would have obtained their information about conditioned reflexes from articles, such as those Crowther wrote for the *Manchester Guardian*, the *Sunday Worker*, and *Plebs*. In all these articles, Crowther emphasized that Pavlov’s research eliminated the ‘mystical’ element from thought. In March 1928, Fox, who worked at the *Sunday Worker* — the Communist Party organ — asked Crowther for articles about science, noting that they could not pay contributors. As the *Sunday Worker’s* scientific correspondent, Crowther showed how Pavlov successfully explained certain actions which were previously put down to mysterious mental factors.

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112 The neurologist Derek Denny-Brown (1901–1981) wrote that Pavlov’s work ‘though recognised to be of extreme importance by physiologists, ha[s] been known in England in only one or two of its aspects, as all the literature of the subject has been in Russian, except for some short accounts.’ *Nature*, 28.4.28, 662.

113 SxMs29/9/12/1, Notes on Anrep, 1928, 1–2.


115 SxMs29/12/2/1, Fox to Crowther, 20.3.28 and Monday [no date].
example, far from being able to “choose”, dogs ‘do what you would expect, if only you knew enough about them.’ Pavlov could explain intelligent actions in animals in terms of cause and effect, and so ‘it is not necessary to suppose they have a spark of a divine something which can exercise the supreme power, that is, can “choose.”’

He challenged his *Manchester Guardian* readers: ‘Why not assume that all so-called intelligent actions are ultimately describable in terms of a long string of reflexes all mixed up?’ The evidence for such an assertion did not yet exist, but Crowther encouraged his readers to infer that even the most intricate behaviours would eventually be resolved deterministically. Daniel Todes has argued quite convincingly that Pavlov was personally no behaviourist, as he did not deny — and tried to explain — the subjective elements of thought. Yet Crowther (like Anrep, who translated conditional as conditioned reflexes) led people in the West to understand Pavlov as a behaviourist.

However, in other respects the material demanded different treatment, depending on the newspaper. Crowther’s article in the *Guardian* appeared just over four months after Crozier told him that ‘vivisection is liable to great abuse, and therefore its operation has to be very carefully watched.’ Crowther subtly disabused his liberal readers of the notion that scientists were wicked men who inflicted pain on animals for no legitimate reason. He did so partly by portraying Pavlov as a genius and as someone who ‘resembles Tolstoy in his intense vivacity, and in his passionate love of sport.’ His athleticism improved his surgical skills by developing his muscles and ambidexterity, and his mastery with a blade enabled him to reduce the pain experienced by his experimental organisms. ‘His operations on the veins were so swift that the dog scarcely noticed them.’

Crowther in fact argued that Pavlov’s experiments were so successful because he had been kind to his experimental organisms. ‘Observation caused Pavlov to regard freedom from pain as one of the chief conditions of success in

116 *Sunday Worker*, 30.6.29.
117 MG, 10.5.29.
119 SxMs29/1/3/1, Crozier to Crowther, 30.12.28.
120 It is worth noting that portraying scientists as somehow superhuman was quite common: Marcel C. LaFollette, *Making Science Our Own: Public Images of Science, 1910–1955* (Chicago, 1990), 67, 71.
physiological investigation’, and he designed his laboratory in Petrograd with the ideal of minimum pain in mind. Later Pavlov eliminated pain entirely, with the use of ‘preliminary operations from which the animal could recover completely before the experiment. Consequently, in the experiment proper the animal was free from pain.’\textsuperscript{121} Crowther therefore partly used the \textit{Guardian} article on Pavlov as a way of disarming middle-class criticism of physiology and science — in doing so, he also undoubtedly helped to raise the \textit{Guardian’s} reputation amongst practising physiologists for responsibly expounding science.

\textit{Plebs} readers had different preconceptions. Crowther’s piece for the \textit{Plebs} appeared in September 1927 under the pseudonym “C-Three” (described by the editor as ‘a well-informed scientific authority and scientific writer’).\textsuperscript{122} Crowther placed great importance on this article, reminding Rowse that ‘The \textit{Plebs} had my article on Pavlov in this month.’\textsuperscript{123} It used Pavlov’s work to support an attack on capitalist exploitation of the working classes and to propose that the desire for freedom is instinctual. Pavlov’s discovery that stimuli such as a buzzer can be both excitatory (causing an external response such as salivation) and inhibitory (activating the cerebral cortex but not producing a response), provided ‘a footing... for an attack on mass-production labour conditions.’ Because the cortex could be stimulated by inhibitory stimuli, ‘being “bored” may be an active, not a passive condition; and may explain why it is so exhausting.’ Indeed, the brain continually fluctuated between excitation and inhibition, and the balance produced states of sleep, hypnotism, unconscious thinking and suggestion. ‘No matter how easy a machine-minder’s job may be normally, his brain can nevertheless be thoroughly exhausted owing to continued active inhibition, from lack of variety in the job.’ Pavlov’s experiments also pointed to an instinctual basis for the desire for freedom, and if this physiological reflex were frustrated in a worker, ‘reflex defence-actions’ would follow, ‘however comfortable his mere conditions of work may be.’\textsuperscript{124}

\begin{thebibliography}{99}
\bibitem{121} \textit{MG}, 10.5.29.
\bibitem{122} \textit{Plebs}, September 1927, 297.
\bibitem{123} EUL MS 113/3/1/c, Crowther to Rowse, 8.9.27.
\bibitem{124} \textit{Plebs}, September 1927, 300.
\end{thebibliography}
More significantly, however, Crowther mounted a defence of the importance of education: Pavlov provided the theoretical grounding for his own writing, and indeed for the Plebs’ project. The failure of the General Strike occasioned something of a crisis amongst Plebs. As syndicalists, they invested great hope in a General Strike, and when that hope was dashed, an explanation was needed. For the labour movement more widely, it soon became clear that it had been a mistake to call out the printers, which left their opponents with a near monopoly on the media. Labour’s failure to put its arguments across marked a turning point in the left’s view of mass communication. Failure of education concerned Plebs too — after all, they were responsible for instructing the trades union leaders who ultimately surrendered to Baldwin. Strangely, given everything, Crowther was in the minority amongst Hogben’s friends for not being ‘so completely overwhelmed with the inevitable disillusionment’ that followed the strike. Undoubtedly, Crowther probably saw the Strike as an essential step in the proletariat’s practical education, a common enough stance amongst Lenin’s followers. However, a number of writers associated with Plebs, as recently argued, attempted to ‘programme’ their working-class readers in preparation for another strike, particularly by writing about May 1926 in an emotive way. “C-Three” asked Plebs to

Consider a man reading a political pamphlet; he sees print, he reacts to the print as if he were denouncing the injustice described, yet it is the print he is seeing, not the injustice. He has a “conditioned reflex” based on his fundamental social reflexes or instincts. It is due to conditioned reflexes that words may be more stimulating than the experience of the events described, and conditioned reflexes are one of the factors that sometimes makes the pen quite definitely stronger than the sword.

The sword, in the form of a General Strike, had failed, and it could no longer be assumed that capitalism was on the verge of collapse. The onus now fell to

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128 SxMg29/11/5/1, Hogben to Crowther, 12.12.27.
130 Ferrall and McNeill, *Writing*, chap. 7. The authors make their argument about ‘programming’ by appealing to the theoretical criticism of Frederic Jameson, but such a circuitous route seems unnecessary.
131 *Plebs*, September 1927, 299.
political propaganda and education, which could press behaviour in certain directions; in the long-term, education could help to undermine people's belief in the sanctity of capitalism. Pavlov, Crowther wrote in his private notes,

found repeatedly that brains shying at adaptive tasks would in the end succeed in performing them, though their beginnings were never so unpromising. Perhaps there is encouragement here for those who are inclined to get fed up with mankin[d], seeing it follow Baldwins and Churchills and Birkenheads so persistently. We have Pavlov's word that even the most hopeless may learn in the end.132

In light of Pavlov's work, Crowther could conceive of his interpreting as a form of applied science. He was attempting to behaviourally modify the way people thought, so that they would be more scientific and — therefore — revolutionary. 'It is certain', “C-Three” concluded, ‘that the elimination of mysticism from the explanation of the behaviour of man will assist in the elimination of mysticism from the explanation of the nature of his social institutions.'133 A simple but powerful message about a rational approach to nature, constantly repeated, would translate into a rational approach to social affairs. It is worth noting here that Anrep himself, who read the Plebs piece, realized what Crowther was trying to do — and thought he succeeded. Anrep, quite astonishingly, did not detect political sentiments in the article, and questioned Crowther's assertion that 'the Bolshies apply Pavlov's ideas'. But he thought it was 'a very good article' — better than one of Anrep's own:

It is not in the least shallow — it is popular, but it describes the facts with that amount of psychological dressing which is helpful, as a lubricant, for the ideas in their penetration into the inflexible and inert substances of our brains.

As a piece of applied psychology, in other words, the article worked well.134

Over the following years, a number of left-wing interpreters — from Fabians to Marxists — saw Pavlov as Lamarck by other means, in the sense that his work justified environmentalism. Wells, Beatrice Webb and Needham all saw the

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132 SxMs29/9/12/1, Notes on Pavlov, [probably 1928], 3.
133 Plebs, September 1927, 301 (my emphasis).
134 SxMs29/1/3/1, Anrep to Crowther, 16.10.28.
potential in Pavlov to change human nature. But Hogben made the connection between Lamarck and Pavlov most obvious. In reviewing a book by the Nazi geneticist Fritz Lenz, which attacked the materialist conception of history for being “substantially identical with Lamarckism”, Hogben suggested that if Lenz had combined with the study of genetics some elementary knowledge of the physiology of the central nervous system he would be aware that a behaviouristic view of human history has no connection whatsoever with Lamarckism... Man is the only animal that can transmit its environment accumulatively.

There was no need to believe in the inheritance of acquired characters to make socialists — nor, for that matter, in eugenics — as humans’ minds were plastic. And contemporaries recognized the key significance of literature in the process of conditioning. In Aldous Huxley’s *Brave New World* (1932), the World State uses ‘Neo-Pavlovian Conditioning’ to ensure ‘lower-caste’ infants tremble before books because ‘there was always the risk of their reading something which might undesirably de-condition one of their reflexes’. For Huxley, as for Crowther, books could re-condition the reflexes established by a dominant social order and thereby destabilize that society. Conditioned reflexes provided a philosophical underpinning for the aim, in Stalin’s unsettling phrase, of engineering human souls.

Conclusion

At a time when many were becoming disillusioned with a science that was increasingly seen to be producing technologies to serve industry, Crowther’s *Tommy Hobson* showed how the education system, the need to make a living and sexual desire meant that even the most creative members of society ended up in

136 *Economica*, November 1931, 467.
an industrial laboratory, doing technical science to increase profits for an impersonal corporation. These scientists were not interested in politics, or indeed in anything outside their narrow technical expertise — they were, in their attitude to life, classicists. For Crowther, then, classicism was a general term of abuse, largely independent of disciplinary training, that signified an inability to appreciate the relevance of science for society. But this determination of roles within science created an opportunity for the invention of new scientific identities — in this case, that of the interpreter. This was true notwithstanding the minority of practising scientists who also interpreted, because — as we have seen — there were potential pitfalls for researchers who wrote for the press, as they were expected to be specialists. But there was also a widespread perception that specialization was harmful, which left an opening for Crowther. Indeed, Crowther laid claim to a role that practising scientists could not perform, largely related to his position as a commercial traveller, or flâneur. As science became more technical, Crowther and others looked back to aspects of nineteenth-century science with fondness.

In his description of himself as ‘not a research scientist in the ordinary sense’, and of his article writing as a ‘formula’ and as an attempt to ‘condition reflexes’, Crowther represented the continued sweeping aspirations for science; Pearson’s argument that there was no limit to science’s reach made a lasting impression. Crowther came to view his interpretations as a form of science in action, based in particular on Pavlov’s research into the nervous system. Pavlov, in a sense, reintroduced the possibility of a Lamarckian transformation in human character. Although, as we saw in the last chapter, Crowther rejected the inheritance of acquired characteristics, Pavlov’s experimental research indicated that the mind was pliable, almost entirely a result of environmental impressions and experiences. The environment was a potent force in the shaping of conditioned reflexes and, as a part of the environment, words could condition. Pavlov therefore offered a way out of the determined system that forced both Tommy

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and Jimmy into petit-bourgeois occupations, and provided a theoretical justification for the ‘slow road’ to revolution that a number of socialists went down after the General Strike. Here is an example, noted in the last chapter, of Crowther’s willingness to update his Marxism in light of new science and circumstances. We could see Crowther’s attempt to apply Pavlov as analogous to eugenics — neither were travesties of ‘real’ science, but sought to apply scientific findings to society, albeit in different ways. The political intention of Crowther’s interpretations is one important reason why the ‘popular science’ label is insufficient. Crowther did not merely write nor attempt to broadcast out of a desire to entertain or instruct his audience: he had a definite aim in mind, one that all of his activities attempted to fulfil. As mentioned in the introduction, most so-called ‘popularizers’ had an aim other than to entertain or instruct, but it is only by thinking about Crowther’s work in terms of interpreting that his scientific and political motivations are revealed. These motivations, in turn, shed light on the wider issue of the emerging role of interpreters in a rapidly changing mass-media culture.

How did people, especially scientists, respond to Crowther’s project? Did they regard him as an imposter, writing on subjects about which he knew little? How, for that matter, did Crowther establish his right to speak out about science, and distinguish his interpreting from that of others? In order to answer such questions, we need to examine his entrance into the book market, where responses to his work — in the form of reviews and letters — are abundant. As shown in the next chapter, in the genre of scientific journalism Crowther attempted to create a scientifically-informed and class-conscious aesthetic.

III

The Genres of Scientific Journalism

A new stage in Crowther’s career as an interpreter, when his name began to appear on book dust-jackets, came at an inauspicious time; the Great Depression. However, even as sales of books fell, it seemed more important than ever to shape the public consciousness of science: if citizens had a better appreciation of science’s possibilities, the situation could be improved. This belief underlay how Crowther shaped and re-shaped science in the process of interpretation in this period. And though it is hard to assess the reception of Crowther’s Manchester Guardian articles (and therefore their role in the shaping of the public sphere), Crowther’s books were widely — and prominently — reviewed, and he received many letters from individual readers; both sources testify to the contemporary significance of Crowther’s work and offer invaluable insights into readers’ responses. In this chapter, I suggest that Crowther’s books mooted a new, scientifically-aware and class-conscious notion of literary merit. He drew on the formal innovations of modernism, but his work remained socially engaged and accessible.¹ He then deployed claims about the nature and merits of this new literature — which he called ‘scientific journalism’ — to build his career and intervene in wider debates about education, policy and British identity.

This chapter is inspired by, and contributes to, work that examines important forms of writing that have not hitherto received appropriate analysis. News reporting, even as early as the seventeenth century, has been considered a lower form of culture than literature proper, with terms like ‘hack’ and ‘Grub Street’ identifying journalism with commercialism. Recently, however, the literary, creative aspects of journalism — and its proximity to fiction — have been stressed.² Similarly, prompted by the work of Gillian Beer and others, historians

¹ For the controversial argument that modernists were deliberately exclusionary, see John Carey, The Intellectuals and the Masses: Pride and Prejudice Among the Literary Intelligentsia, 1800–1939 (London, 1992).
of science have paid attention to how scientific writing adopted different literary techniques, as well as to the deep influence of scientific ideas on fiction. In recent research, different works are not pigeonholed as primarily scientific or literary, but placed within a wider marketplace of available knowledge. Within this marketplace, works on science sat alongside, drew upon and influenced other forms of literature. As such, interpretations of science for a wide audience took on many different forms, narrative techniques, analogies, and genres. Such an approach seems especially suited to the nineteenth century, a period when the fluidity was particularly apparent. As Gowan Dawson points out, however, the Victorian era was not unique, and thinking about the period in terms of a common culture is simplistic: the alleged single culture began to break up in the late 1800s, and early twentieth-century modernist literature could still interact with developments in physics. Interwar audiences were exposed to increasing volumes of printed matter, along with a proliferation of different styles and genres; though, as Hazel Hutchison points out, this meant that readers could jump between topics (and thereby potentially overcome specialization), they also had to understand the conventions and intertextuality common to each genre. By thinking about the writing of the interwar period in terms of genre — constantly changing categories that nevertheless provide comfort to readers due to the recurrence of familiar elements — it is possible to overcome the pigeonholing of works like Crowther’s as ‘popular science’, which — as we saw in the

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4 A recent example is Marsden, Hutchison, and O’Connor, *Uncommon Contexts*.


6 Hazel Hutchison, ‘“The Telegraph Has Other Work to Do”: Reading and Consciousness in Henry James’s *In the Cage*, in Marsden, Hutchison, and O’Connor, *Uncommon Contexts*, 171.
introduction — implies the existence of a stable ‘public’, outside of the scientific community.\footnote{Baldick, Modern, 253. For definitions of genre, see especially Adam Roberts, Science Fiction (London, 2006), 13; John Frow, Genre (Hoboken, 2013).}

To claim that a unified culture existed in the 1800s was, in Paul White’s words, a ‘polemical construct’ that enabled individuals to fashion their identity. T.H. Huxley and Matthew Arnold, for example, established their authority — and undermined that of clergymen — by working together.\footnote{White cited in Dawson, ‘Literature’, 312–14.} Crowther similarly fashioned his identity by claiming scientific journalism as a space where science and literature met; it was an art of synthesis in an era of specialization. Indeed, Jimmy made the claim that his writing possessed literary quality to establish his right to speak about science at a time when many interpreters of science were practising scientists. As we shall see, he further claimed — drawing on the psychologically-based literary criticism of I.A. Richards — that the literary qualities of his work meant that it was superior to that produced by research scientists (who wrote as a hobby). Hopkins’s comments, quoted in the introduction, and the reviews quoted in this chapter, suggest that he successfully convinced many of this. By attempting to deny scientists the ability to interpret science for a lay audience, Crowther was in fact reinforcing and developing the idea that C.P. Snow would make explicit in his 1959 lecture. Although creating a role as a scientifically-qualified interpreter who possessed literary ability would appear to bridge the arts/science divide, research scientists would — in Crowther’s ideal world — not actively engage in interpreting.

The genre-based approach to literature and science is explored in this chapter through Crowther’s books, which attempted to define a new form of communication — that of scientific journalism. For Crowther, modern civilization was witnessing a new renaissance, and ‘Those who drift through the twentieth century without noticing science are like Italians of the Renaissance period who never learnt there was a Renaissance and had never heard of Michael Angelo.’\footnote{Plebs, June 1929.} In order to prevent such ignorance and the consequent decay of civilization, Crowther drew upon the literary expectations of his readers to influence their
attitudes towards science. This chapter focuses on: two of Crowther’s books in his ‘Science for You’ series (*Science for You* (1928) and *Short Stories in Science* (1929)), which were republications of his articles that originally appeared in the *New Statesman* and the *Guardian*; an unpublished novel, *BISRA* (1929); and *An Outline of the Universe* (1931), a sweeping, epic overview of all the sciences. By innovating in form, Crowther obeyed the modernist call to ‘make it new’.

### Science for You

The ‘Science for You’ series, which consisted of books containing ‘short essays, understandable by anybody, on subjects from every branch of modern science’, joined a host of new series that appeared in the 1920s, all of which explored how to attract readers. Published by Routledge, which the publisher Frederic Warburg (1898–1981) remembered as ‘an old-fashioned firm, highly respected and of substantial size’, the series was backed by C.K. Ogden (1889–1957), ‘an extraordinary organiser of intellectual output’ (according to Rowse) who played an important role in the shaping of interwar British culture. It is revealing of that culture that Ogden studied classics at Cambridge, where he also edited the *Cambridge Magazine* and presided over the Heretics Society, before making original contributions to linguistics and becoming an energetic commissioner for Kegan Paul (which was ‘inseparable’ from Routledge). An eccentric figure, he was responsible for establishing Routledge’s reputation as a publisher of science, psychology and education. Ogden ran a number of series, including ‘Psyche Miniatures’, ‘The International Library of Psychology, Philosophy and Scientific Method’, ‘To-day and To-morrow’ — and ‘Science for You’. Historians have tended to underrate the importance of ‘Science for You’ in relation to these other series, especially ‘To-day and To-morrow’. But this is not to compare like with

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11 SxMs29/12/2/1, *Science for You* blurb; Bowler, *Science*, 114, 133–139.
14 Sleigh, *Six Legs*, 142.
like: ‘To-day and To-morrow’ publications were pamphlets, often dealing in fantastical visions of the future, whereas ‘Science for You’ mostly republished collections of short articles on contemporary science intended to inform the nonspecialist public about the science and technology that shaped their lives (table 1).\textsuperscript{15} Furthermore, ‘Science for You’ made an impact: Ogden wrote to Rowse after the publication of Crowther’s first book in the series, Science for You: ‘I am so glad the reviewers are so sensible about his book. It seems he has a possible “public.”’\textsuperscript{16}

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
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<tr>
<td>J.G. Crowther</td>
<td>Science for You</td>
<td>1928</td>
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<tr>
<td>Professor D.F. Fraser-Harris</td>
<td>Coloured Thinking, and other Studies in Science and Literature</td>
<td>1928</td>
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<tr>
<td>Professor H. Munro Fox</td>
<td>Blue Blood in Animals, and other Essays in Biology</td>
<td>1928</td>
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<tr>
<td>Professor D.F. Fraser-Harris</td>
<td>The Sixth Sense, and other Studies in Modern Science</td>
<td>1928</td>
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<td>C.M. Yonge, D.Sc.</td>
<td>Queer Fish: Essays on Marine Science and other Aspects of Biology</td>
<td>1928</td>
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<tr>
<td>Professor D.F. Fraser-Harris</td>
<td>The Rhythms of Life, and other Studies in Science</td>
<td>1929</td>
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<td>J.G. Crowther</td>
<td>Short Stories in Science</td>
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<td>J.G. Crowther</td>
<td>Osiris and the Atom</td>
<td>1932</td>
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\textit{Table 1: List of ‘Science for You’ books. Crowther, the physiologist D.F. Fraser-Harris (1867–1937), the zoologist Harold Munro Fox (1889–1967), and the marine biologist Charles Maurice Yonge (1899–1986) contributed volumes, and together their essays covered everything from}


\textsuperscript{16} \textit{EUL MS 113/3/1/O}, Ogden to Rowse, 1.7.28.

Science for You appeared in a significant year for the book trade: in retrospect, Warburg dated the death of publishing as ‘an occupation for gentlemen’ to 1928, when Victor Gollancz was founded and introduced sensation, brash advertisements and colourful dust-jackets. Before then, Warburg wrote, ‘Book jackets were optional and were called dust wrappers, merely because they served to keep the dust off the books, not to fascinate potential readers with dazzling if misleading designs.’18 ‘Science for You’ casts doubt on this romanticized portrayal of a pre-modern book trade; more importantly, perhaps, it shows that Crowther was willing to design his books to appeal to the large novel reading public.

Crowther designed the physical form of the books, which differed from other books published by Routledge & Kegan Paul (as well as from books from other publishers), thereby creating new expectations amongst readers.19 Ralph Fox thought that ‘Routledge have certainly made a good job’ of Science for You and Jimmy’s sister, Dodo, joked that she received it like ‘a bolt from the blue’ (fig. 3), and commented on the ‘sociable’ orange colour of the binding.20 Overall, she found the book more attractive than Rowse’s ‘turgid manual’ On History: A Study of Present Tendencies (1927) — a defence of the Marxist conception of history — that appeared in the ‘Psyche Miniatures’ series. If Psyche Miniatures were small, short publications with cream boards, red cloth spines and a modest price to match (2/6d.), Science for You was larger, completely covered in cloth and, though costlier (5/-), was still ‘marvellously cheap’ according to Humphrey Milford (Publisher to the Oxford University Press).21 In fact, that description was probably best suited to Benn’s Sixpenny Library or Watts’s recently launched

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17 A.G.N., ‘The Late Professor D.F. Fraser-Harris’, Canadian Medical Association Journal, 36 (1937); see the ODNB for details on Munro Fox and Yonge.
19 Crowther chose the octavo format, the typeface, the cloth for the binding and the artist for the dust-jacket. He also wrote the publisher’s ‘puff’. See SxMs29/1/3/1, Crowther to Secretary of Institute of Physics, 10.3.29; SxMs29/9/2/2, Crowther to Jonathan Cape, 30.12.28.
20 SxMs29/12/2/1, Fox to Crowther, Monday [1928] and Dodo to Crowther, Easter Monday [1928].
21 OUR, Milford’s Letter Book vol. 129, Milford to Crowther, 17.3.28 (p. 453).
Forum Series (1/ in cloth, 7d. in paper). Yet size and cost did not necessarily mean that Psyche Miniatures were more accessible: Crowther thought On History ‘a hard little pebble that will stick in the throats of the reactionaries’: indeed, it was ‘a little too hard to be a great seller’.  

Maurice Dobb marvellled at how Jimmy managed to ‘make Routledge venture on anything so good & attractive? Quite the opposite pole from their usual textbooky-style.’ Dobb added that this ‘admirable introduction to a most exacting series’ had a ‘binding & cover-wrapper [which] are a joy & delight to the eye.’  

Though paper covers for protection of cloth bindings had a long history, as late as 1910 they remained relatively plain; it was not until the 1920s that the tendency to employ up-and-coming artists spread. Crowther chose Montagu Phillip Mendoza (1898–1973) to illustrate the covers of Science for You and Short Stories in Science (fig. 4). Over the course of his career Mendoza’s illustrations

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22 EUL MS T15/3/1/c, Crowther to Rowe, 8.9.27.
23 SxMs29/12/2/1, Dobb to Crowther, 29.3.28.
embraced a range of styles, from comics in the *Sunday Express* and the *Evening Standard*, through political cartoons and fantasy works, to dust-cover illustrations for thrillers and science fiction. At the time of his commission for Crowther’s books, Mendoza was producing political cartoons under the pseudonym “Flambo”. Most of these were associated with the ILP’s organ, *The New Leader* (“Flambo” illustrated its cover from 1925 to 1929).\(^{25}\) Though most contemporaries may not have picked up on this political link, Crowther’s dust-jackets were attractive and elaborate: they would have been suitable covering novels and provided an indication of his intention to make science a material for literature.\(^{26}\)

![Image of book cover](image)

**Figure 4:** Mendoza’s dust-jacket for *Short Stories in Science* (SxMs29/12/3/2)

The link between science and literature was also established through Crowther’s writing style, described by R.M.F (Richard Michael Fox) in the *Irish Statesman* as ‘ideal for the accurate presentation of knowledge… There are no

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\(^{25}\) Little is known about Mendoza: see [http://bearalley.blogspot.co.uk/2007/03/philip-mendoza-montague-philip-mendoza.html](http://bearalley.blogspot.co.uk/2007/03/philip-mendoza-montague-philip-mendoza.html) (accessed April 2013)

\(^{26}\) Whitworth, *Einstein’s Wake*, 51 for the importance of ‘marginal’ features of texts.
superfluous words in these essays; the language is firm and simple.’

As a working-class socialist who left school at fourteen and a prolific journalist who contributed to the *New Statesman* at the same time as Crowther, Fox appreciated the importance of clear language when writing for laypeople and was himself a model reader. Jimmy described his ideal audience to his American publisher: ‘I am aiming at the educated reader who seriously wants to know something about science and is yet not a scientist.’ This was ‘the middle-distance between the low-brow popular book and the more definitely technical book which expects, for example, the reader to know some mathematics.’ This audience — not large, but ‘dependable’ — wanted ‘something plain and accurate.’ At the beginning of 1927, Crowther was gratified that Rowse had detected ‘some glimmering of a style’ in his articles, because ‘they seem to be rather a collocation of words to me… I don’t know a word of grammar & my spelling is uncertain’. Crowther was plagued by a self-doubt that did not come through in his later accounts of his “invention” of scientific journalism.

In the development of a writing style, Crowther learnt from authorities as varied as William Cobbett (1763–1835), Arthur Quiller-Couch (1863–1944), and the Bible. In 1924, according to the socialist G.D.H. Cole, Cobbett’s *A Grammar of the English Language* (1818) was ‘still the best introduction to a knowledge of the language for the type of readers he had principally in mind’. Cobbett intended his grammar to be read by the working classes; it was ‘a weapon against his country’s system of government and its rulers’. Crowther also read Arthur Quiller-Couch, novelist and professor of English Literature at Cambridge University. In *On the Art of Writing* (1916), Quiller-Couch advocated ‘straight prose’ which avoided abstract words and circumlocution and employed direct, short words. Quiller-Couch particularly admired the King James Bible, and

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27 *Irish Statesman*, 27.7.29.
29 SXM29/1/3/1, Crowther to Brentano, 11.3.29.
30 EUL MS113/5/1/c, Crowther to Rowse, 28.2.27.
stood ‘humble and aghast’ before its wonder. Crowther too took inspiration from the Authorized Version of the Bible, as he acknowledged in a letter to Ernest Rutherford in 1929. Crowther wanted a reference for a Kahn Travelling Fellowship, which would have allowed him to spend a year travelling: in such ‘easier conditions I might do much more towards extending the public understanding & appreciation of science.’ As he lacked a degree — a requirement for the scholarship — Crowther outlined in detail the rationale behind his writing. Rather than representing science ‘as a collection of clever and amusing tricks’ Crowther wanted to ‘indicate by the dignity of [his] literary style the spiritual exaltation of the scientific spirit’ and clothe ‘its powerful ideas in simple but dignified language.’ It seemed to Crowther that

a writer truly inspired by modern science might perfectly well use an English as fine as that of the Authorised Version of the Bible (in the writers inspired by the Reformation). So I started definitely with the idea of trying to use science as a material of literature. The simpler and more rounded theories were to be expressed in a style which enabled the reader to realise he was in the presence of great achievements, and that the age he lived in was at least as distinguished as any other, but that the source of this distinction must be found in the development of scientific ideas.

Crowther, then, saw himself as constructing a Bible for the modern age: science, rather than miracles, explained natural phenomena, and science was the salvation and inspiration for humanity. Crowther often drew directly upon Biblical turns of phrase in order to update religious stories in light of modern knowledge. He enjoyed subverting the opening of Genesis by putting a materialistic universe in place of God’s guiding hand: ‘In the beginning was the cloud, and out of the cloud nebulæ condensed, and out of the nebulæ stars, and out of the stars planets, and out of the planets satellites.’ For readers used to religious rhetoric, these analogies — written in the ‘plain, honest, even artless prose’ of the Bible — would

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have been immediately recognizable and would have made Crowther’s explanations more intelligible.  

Crowther reflected on the difficulty of imparting scientific knowledge in the final, concluding, chapters of *Science for You* and *Short Stories in Science*, which are key to understanding Crowther’s project. These articles were Crowther’s manifestoes: they defined his form of scientific journalism against other ways of interpreting science, and aimed to convince readers that he was capable of writing about science. In ‘Science and Journalism’, for example, which appeared at the end of *Science for You* (but first drafted at the end of 1926), Crowther argued that in order to make the public think scientifically, interpreters must avoid jargon, use plain reasoning and search for vivid illustrations and analogies. In this way, the abstract concept could be brought down to earth.

Because it was hard to find analogies that were not misleading, scientific journalism was more difficult than other types of writing. Indeed, Crowther occasionally lapsed into what Wells called in 1894 ‘vulgar wonders of the “millions and millions and millions type”’. In 1920, J.W.N. Sullivan disparaged attempts to amaze readers as ‘marvel-mongering’. One of Crowther’s readers, Alfred Jordan from Hull — likely a member of the city’s Literary Club who delivered a lecture on ‘Literature in Relation to Science’ in 1891 — wrote to Crowther to criticize him for marvel-mongering. Crowther’s article on ‘The Universe: How Big is It?’ confirmed Jordan’s suspicion that since Einstein, the principles of astronomy ‘can no longer be apprehended by the common man’ without the construction of ‘some bridge between the mathematician and the less gifted student’. Crowther’s article was useless: ‘384 billion miles repeated five times might be repeated a thousand times for any effect they leave on the mind.’

Crowther acknowledged that ‘the position is now very difficult for any simple

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37 Whitworth, *Einstein’s Wake*, 50–51 for the importance of final chapters.
40 Quoted in Lightman, *Victorian Popularizers*, 424.
42 SxMs29/9/2/2, Alfred Jordan to Crowther, 25.7.28.
conceptions or images to be put forth in modern science.’ Partly, this was due to humans’ evolutionary limitations. Although ‘our imagination evolved to fit only the grosser aspects of the world’ and ‘the finer ones revealed by modern science depend on the logic of mathematics’, it seemed to Crowther ‘necessary to tell the intelligent reader of the kind of thing the scientist is saying about the world, even if it isn’t very intelligible.’ He hoped, perhaps as a result of conditioning, that ‘our children or grand children will find the new ideas more natural.’

As Jordan’s letter indicates, developments in modern physics especially were seen to be counter-intuitive and difficult to explain. Crowther therefore most admired the physicists James Jeans (1877–1946) and Arthur Eddington (1882–1944) for their artistic writing style and ability to explain their research. In notes dated 1927, Crowther assessed these ‘twin stars of modern astrophysics’. Eddington’s ‘mild and gauche appearance’, his inability to speak cogently without preparation, his possession of ‘the hard “a” of the northerner’s speech’ contrasted with his ability to ‘explain his discoveries, and other people’s, not only in intelligible, but in delightful language.’ Crowther considered Eddington a poet in his ability to make ‘apt and shining similes… out of fashionable oddities of dress and common trivial details of daily life.’ The succession of pertinent analogies in Stars and Atoms (1927) rendered it probably the best popular science book ‘that has been published in this century’. Eddington’s prose was occasionally clumsy, but only because ‘his power of writing comes from the extreme clearness of his ideas, which cannot help often expressing themselves brilliantly.’ If Eddington’s style was ‘inspired’, Jeans’s was ‘cultivated’. This ‘compact’, ‘downright and impatient’, beaky man could also explain his researches well, in ‘a prose style, learnt by literary aptitude from the ancient classics.’ In a review of Jeans’s Astronomy and Cosmogony (1928) in the Sunday Worker, Crowther saw scientists’ ‘sensitiveness to cultivated exposition’ as a sign ‘that the awaited synthesis between science and art is beginning to bloom.’ Ultimately, Crowther

43 SxMs29/9/2/2, Crowther to Jordan, 28.7.28.
could not decide who was the greater man — they spurred one another on and
‘perhaps neither would have been so great’ without the other.  

Science as a Material for Literature

The ability of Jeans and Eddington to describe their research was perhaps
unsurprising because, as Crowther argued in the concluding chapter of Short
Stories in Science (‘Science as a Material for Literature: the Psychology’) there
was a common imaginative basis to science and art. In its attempt to theorize
about the psychology of the interpreter of science, this essay was more outlandish
than ‘Science and Journalism’. Drafted at the beginning of 1929, Crowther
initially tried to have the article published in T.S. Eliot’s Criterion, sending the
manuscript via Rowse, who knew Eliot (Rowse informed Eliot that though ‘a
clever man’ who ‘has many things worth saying’, Crowther ‘writes
unprofessionally’). Crowther’s choice of journal is instructive, as it suggests a
desire to reinstate the apparent ‘common culture’ that had existed in Victorian
literary periodicals, but Eliot rejected the article because ‘although it is interesting
it seems to me a little thin for our purposes.’ In the essay, Crowther suggested
that success in both art and science depended on a powerful imagination; it was
absurd to propose that scientists lacked imagination. Here, Crowther deviated
from scientists’ established fear of the imagination, which was seen to entangle
practitioners in the scientific process, thereby corrupting its objectivity.
Crowther described how a physicist might use their imagination to assess the
accuracy of a theory of atoms. First, they learnt ‘the facts already known about
matter, the story or the drama of matter’, before casting ‘his image of the atom as
the hero in this drama’. If the atom succeeded in ‘impersonating every part, the
image of the atom is considered to be “correct”.’ If not, and it failed in particular

44 SxM$29/12/2/1, notes on Eddington and Jeans, 1927; Crowther, Science, 46; Sunday
Worker, 24.6.28.
45 Eliot to Rowse, 21.3.29, in Valerie Eliot and John Haffenden (eds.), The Letters of T.S.
The Criterion: Cultural Politics and Periodical Networks in Inter-War Britain
(Oxford, 2002).
acts, ‘it is only “approximately correct”’ and needed to be modified. Niels Bohr’s model of the atom could be ‘articulated at will. He made it perform, and it danced to the score of the spectra as no other image had done before.’ And, when he wrote down mathematical equations to express what he had seen in his imagination,

He was making literature, a written record of the contents of his imagination, and the greatness of his literature is measured by the success of his images in performing the drama of matter, as the greatness of Hamlet lies in the successful performance by that imaginary figure of the spiritual drama of humanity.\(^\text{47}\)

As this comment indicates, a difference did exist between the ‘drama of matter’ and the ‘spiritual drama of humanity’: though Crowther later claimed to have argued ‘that science and literature are different aspects of one more fundamental thing, and at a sufficiently deep level there is no fundamental difference between them’, this obscures his original intention for the essay, which was to justify his own work and suggest that the conjunction of science and literature occurred in its highest form in the writing of those dedicated solely to science exposition.\(^\text{48}\) Though scientists and humanists both used their imaginations, they imagined different things. Writers of humane literature usually thought of people, whereas scientists dealt with things. Even when imagining people, scientists lacked an emotional response: their images ‘are objective, even when of persons, since the imaginer is not concerned with his own reactions to the images but to the relations between the parts of the images.’\(^\text{49}\)

Significantly, Crowther put this difference in imagination down to instinct; as such, it bore the mark of the literary criticism of I.A. Richards and Ogden himself. Broadly speaking, Richards attempted to make literary criticism scientific, by drawing on instinct theory to explain people’s automatic and emotional responses to reading literature. Intellect, absent the vital flame of instinct, was insufficient to benefit from, still less create, art and literature. Those who lacked the decisive (vague, but certainly not brutish) instincts were doomed forever not to appreciate

\(^{47}\text{Crowther, }\emph{Short}, 201, 202.\)
\(^{48}\text{Crowther, }\emph{Fifty}, 45.\)
\(^{49}\text{Crowther, }\emph{Short}, 200–1.\)
literature. On the other hand, those with a dearth of learning (particularly of biology) were liable to be unable to discern between rational argument and beliefs based on feeling.\(^50\) In his article, Crowther attempted to delineate the instincts that distinguished humanists and scientists, and those able to appreciate humanistic and scientific literature respectively. Humanists, with a tendency to think in wholes, were stimulated by the herd and sex instincts; scientists, tending to imagine the external world, were motivated by self-preservation (‘Knowledge of the external world’, Crowther explained, ‘obviously helps towards survival’). Literature could be further classified into objective, herd-literature like that of Tolstoy and Shakespeare on the one hand, and subjective, sex- and ego-literature like that of Shelley and George Bernard Shaw on the other.\(^51\)

History supported the idea that scientists could summon things easier, whilst artists could more easily summon people. Charles Darwin, for example, could not appreciate poetry in his old age because the relevant instincts had atrophied from underuse; poetry ‘raised no images in his mind.’\(^52\) Crowther used this example to supplement Aldous Huxley’s insight that poetry had traditionally been concerned with wholes rather than abstractions.\(^53\) ‘If poets had not been so nervelessly tied to the “wholes” of herd, sex and inanimate objects, they would have written a poetry of parts and abstractions which might have raised the most brilliant images in Darwin’s supreme imagination.’ Scientists unable to appreciate literature and humanists unable to understand science both had ‘lop-sided’ imaginations, a result of their drawing on different types of instincts.\(^54\)

Because ‘the awakening of a general interest in science is one of the chief problems of the day’, science had to be made interesting to those used to exercising the literary part of their imagination by relating science to more well-known, literary images: this required a balanced imagination that most scientific practitioners lacked. Writers ‘must always be hunting for exciting implications’

\(^{50}\) For the instinctual basis of Richards’s approach, see Sleigh, Six Legs, 145–153; LeMahieu, *Culture*, 135–156. Crowther would almost certainly have read I.A. Richards, *Science and Poetry* (London, 1926).


\(^{52}\) Ibid., 208.


\(^{54}\) Crowther, *Short*, 209, 205.
and express these ‘as clearly as possible’ with ‘picturesque similes [sic] frequently interspersed’. If scientists tried to link science to ordinary affairs of life, they would waste their energy and neglect their research. Or they would produce ‘flat, patronizing accounts for the “layman”’, even though the layman might be Proust or Shakespeare, ‘or any other genius whose imagination was supreme though non-scientific’. Scientists who attempted to write in a non-technical way tended to fall back on ‘personal anecdotes to supplement dry descriptions’, the intention being ‘to give the “human touch” to inhuman science; the graceful declension from Sciencehead to humanity.’ Effective interpretations of science, like Crowther’s, were therefore impersonal and relied on the writer’s ability to conjure and connect ‘both literary and scientific images’: such writers resided at the juncture of science and literature. So, where Richards confined the appreciation of literature to those who were blessed with the relevant instincts, Crowther’s move was more complex. Most people had imaginations, but only a few truly exceptional individuals were blessed with the relevant instincts to engage in scientific journalism. Implicitly, Crowther publicly presented himself as such a prodigy; he had the necessary learning, and was in touch with the instincts that underlay the humanistic and scientific imaginations (which he kept alive by dipping his toes in both worlds).

Crowther deployed this argument to carve out a position for himself. In 1927, Julian Huxley resigned from the King’s College Chair of Zoology to write The Science of Life in collaboration with H.G. and G.P. Wells. Crowther reported the news in the Manchester Guardian and although none of the other major dailies did so, a report in Nature appeared on the same day. Nature was surprised by Huxley’s move, but saw it as symptomatic of the emergence of

a large body of the general public which desires further knowledge, but also, in the shape of cheap printing, broadcasting, instructional films, and the systemisation of popular lectures, the means for gratifying this desire without recourse to formal lectures at a college or university.

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55 Ibid., 210–211.
56 Huxley, ‘Subject-Matter’, 37; Crowther, Short, 212.
Sufficient demand, and the means for satisfying that demand, made Huxley’s resignation possible. But these developments were also significant to teachers, because individuals were now able ‘to make a livelihood without lecturing to students in a college or university.’ Attachment to an academic institution would still be an advantage, though (Huxley retained an honorary position that allowed him to research), ‘with their facilities for research and study and their atmosphere of learning.’ The institution would benefit, too, from being ‘associated with any new means of spreading knowledge, and with any one, whatever his method of obtaining a livelihood, who desires to devote his energy to pure research.’ Nature concluded by wondering how academic organization would adapt to the new situation. Huxley’s resignation, then, was potentially symptomatic of a new era in the scientific career, where individuals would derive their main income from interpreting rather than academic teaching, whilst doing research on the side. Interestingly, Nature seemed confident of ‘the success of this new and courageous venture’, presumably predicting that Huxley’s arrangement would become increasingly common.\(^\text{57}\) Crowther was not so optimistic, but not because he did not recognize the significance of the widespread desire for scientific knowledge and the multiple means of satisfying that desire. ‘Scientists will watch the progress of his experiment with the keenest interest. It has long been felt that the present combination of academic teaching with research is not the only possible one.’ In his draft of the article, Crowther had inserted the word ‘courageous’ before ‘experiment’, perhaps betraying his belief — and hope — that few scientists would imitate Huxley.\(^\text{58}\) If he succeeded ‘in inventing a new vocation for scientists he will certainly have added to the interest and variety of life but he will probably not have many followers. The combination of research ability and fluency with pen and speech is too rare among scientists.’\(^\text{59}\) Two years later, Crowther made sure to send Huxley a complimentary copy of Short Stories, where Huxley would have read:

> It is difficult to pursue two great arts successfully at the same time; the art of exposition and the art of discovery. Those interested in the creation of

\(^\text{57}\) Nature, 14.5.27, 722.
\(^\text{58}\) SxMs29/9/2/1, ‘Huxley’ draft.
\(^\text{59}\) MG, 14.5.27, 12.
literature through the exposition of science should realize the danger and make a choice. A prodigy may successfully create literature out of the science he is continually creating, but the great feat is very rare. The majority of scientists should avoid non-technical exposition.  

One only had to read Huxley, Crowther thought, to see that he was no such prodigy. Huxley’s ‘rather journalistic prose’ dealt ‘with the interesting details of biology admirably, but washes superficially over any idea which is really difficult.’ Crowther contrasted his own non-journalistic and non-superficial style with Huxley’s; articles dealing with profound problems required more than Huxley’s ‘gifts of simple narration and imaginative speculation’.  

Some readers of Short Stories were convinced by Crowther’s argument, precisely because he had successfully made science a material for literature in his short stories. Eva Hibbert, a chemist from the College of Technology in Manchester, thought that ‘In your lucid exposition “science becomes a material of literature” and each article creates further interest in its subject.’ Similarly, Crowther’s friend William Kerr (1886–1959), associate Professor of Mechanics and Mechanical Engineering at the Glasgow and West Scotland Technical College, was so engrossed in the book that he was late to a lecture and a lunch appointment; he thought Crowther’s ‘art is rising to quite considerable heights’. Kerr had ‘dabbled so long in highly specialised work that I find a very great need for such an expositor as yourself to describe the really great things that are going on in advanced physical science.’ But, as well as praising the usefulness of Crowther’s work to specialists, Kerr also enjoyed the final chapter, where Crowther — instead of using ‘his art to expound other peoples’ work’ — ‘with directness and force expressed his own opinions.’ Though Crowther spent most of his time ‘explaining difficult things’, his ‘powers are most clearly manifested in this last section.’ Kerr urged Crowther to do more along these lines, because ‘the exponent of modern science for the general reader is compelled to select those aspects with which he can deal in a somewhat sensational fashion’ and it therefore ‘helps to balance his efforts when he seeks to claim for science that place

60 Crowther, Short, 213. For the list of complimentary copies, see SxMs29/12/3/2.
61 SxMs29/9/3/4, ‘If We Were the Size of Atoms’.
62 SxMs29/12/3/2, Hibbert to Crowther, 21.10.29.
in literature which it deserves — but does not get." The success of Crowther’s attempt to carve out a niche for his work is also seen in a review of *Short Stories* in *Nature*. Entitled ‘Popular Science under Discussion’, the review was framed as a conversation between the reviewer, the agricultural scientist Bernard Augustus Keen (1890–1981), and ‘an educated man disclaiming any special knowledge of science’. They discussed eight recent books in turn, four of which were authored by practising scientists. The literary device used by Keen was a way of imagining how the layman might respond to each of these books. As a result, literary style was a topic touched upon throughout. Keen was particularly eager, given that ‘Crowther implies in the preface that he is a layman in science’, to discuss whether ‘the discoverer [is] the best man to explain his own discoveries, and those of others, to the educated public?’ Neither provided an answer to this question, but both agreed that they ‘thoroughly enjoyed’ Crowther’s book, with Keen adding that ‘If every layman-author understood as much of science and wrote as well as he does my question would be answered.’ Keen was swayed by the ‘cogent’ argument presented in the final chapter, which ‘merits the careful attention of all scientific workers who hanker after the fleshpots of journalism.’ ‘F.W.A.’ in the *Cambridge Review* similarly thought the chapter ‘an amusing account of some of the pitfalls awaiting the writer of popular books on science.’ Crowther’s ‘cultivated exposition’, then, helped to establish his claims to speak out about science, and perhaps exploited a more widespread perception that research scientists should not interpret.

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63 SxMs29/12/3/2, Kerr to Crowther, 16.10.29.
64 *Nature*, 23.8.30, 266.
65 The books in question were *The Pastures of Wonder: the Realm of Mathematics and the Realm of Science* by Professor Cassius Jackson Keyser, *Modern Science: a General Introduction* by Professor J. Arthur Thomson, *The Rhythms of Life, and other Essays in Science* by Dr. D.F. Fraser-Harris (a Science for You book), and *Science and the New Civilisation* by Robert A. Millikan. *Popular Research Narratives: Fifty Brief Stories of Research, Invention or Discovery, directly from the ‘Men who did it’*, could be added to this list. The remaining three — Crowther’s *Short Stories*, Amabel Williams-Ellis’s *Men Who Found Out: Stories of Great Scientific Discoverers* and Commander Bernard Acworth’s *This Bondage: a Study of the ‘Migration’ of Birds, Insects and Aircraft, with some Reflections on ‘Evolution’ and Relativity* — were not written by practising scientists.
66 Melinda Baldwin has pointed out to me that the editor of *Nature*, Richard Gregory (himself not a practising scientist) may have passed Crowther’s book on to a sympathetic reviewer. This is surely true, but it is still notable that Keen praises Crowther’s book in particular.
67 *Cambridge Review*, 20.11.29.
It was not just scientists who could draw lessons from Crowther’s books, though; writers of fiction could, too. According to the *Bookfinder Illustrated*, *Short Stories* was indeed as interesting as a novel, though to say so was a ‘poor compliment’ to Crowther. The review recommended that ‘many of our new fiction-writers would do well to read these *Short Stories in Science* to learn how short stories (and long ones, too, for that matter) should be written.’ To provide such a recommendation was ‘far fairer’ to Crowther ‘and also a great kindness to the novel-reading public’. In fact, Crowther had already tried to provide such a kindness himself, by writing his own novel that was informed by the literary techniques and arguments he had developed in the Science for You series.

By republishing his articles in book form, Crowther and the other authors in the Science for You series were succumbing to the demands of readers. According to the astronomer George Ellery Hale (1868–1938), it was not worth writing full length books in the United States: instead, Hale preferred to write magazine articles (largely for *Scribner’s Magazine*) which could then be republished as small books such as *The New Heavens* (1922), *The Depths of the Universe* (1924) and *Beyond the Milky Way* (1926). This reflected wider trends in the literary market: most readers sought out magazines and newspapers, which meant that writers of books relied upon journalism to make a living. For many intellectuals, newspapers, magazines, the cinema and radio were forms of entertainment for the mindless masses; universal education was a disaster that had cheapened culture. As Crowther noted, D.H. Lawrence was ‘driven almost mad at the thought of’ modern literature, and his disciple Aldous Huxley ‘deprecates its condition in pessimistically pullulating phrase.’ Such ‘avant-garde’ authors, though they reluctantly engaged in mere journalism, regarded themselves as holding back the

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68 *Bookfinder Illustrated*, February 1930.  
71 *Sunday Worker*, 20.10.29.
tide of commercialism. Crowther accepted the situation, and tried to adapt to it. In terms of books about science, if Hale was right, Crowther concluded that ultimately ‘very few books on science will be written’ in America, and those ‘published would consequently be collections of republished articles’, exactly like his own. But rather than abandon the writing of scientific books, Crowther considered ‘the literary technique of constructing books out of articles.’ In doing so, he betrayed his desire not to abandon the masses — as practising scientists seemed destined to — but rather to draw them back to reading books. Indeed, his reflections on Hale’s comments appeared in the preface to an unpublished novel, BISRA, drafted around the same time as Short Stories was being prepared for press. Crowther drew upon his experience as a scientific journalist to create a new type of novel, which was innovative in form, blurred the distinction between literature and factual writing about science, and attempted to exploit the popularity of novels for educational purposes. Crowther hoped to rescue literature by injecting it with a healthy dose of science.

As ‘A Novel of the scientific life, directly narrated… in 99 articles’, Crowther presented BISRA as simultaneously a natural development of the articles he was used to writing, and as a radical innovation in narrative form. The individual ‘articles’ were about 1,200 words each, because Crowther found he had ‘the habit of thinking and writing in sections of about twelve hundred words.’ He therefore wondered whether ‘sections of article-length can be constructed into complete studies of a theme?’ If so, ‘literature might be able to exploit for creative purposes the skill of journalists.’ This technique had several benefits. Firstly, it drew upon an existing method of writing, ‘just as the design of gothic stone pillars naturally evolved out of the shape of bundles of tree-trunks used as pillars in wooden early gothic churches.’ Secondly, individual article-chapters ‘should be specially easy to serialise for newspaper publication.’ There were, then, several practical reasons for adopting this method, including the ability to reintroduce novels into newspapers, thereby securing a wider readership. He was unaware of anybody having used ‘precisely this technique in writing a novel, though doubtless it has

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72 SxMs29/12/39/3, ‘Notes for Preface to BISRA’, 2.
often been used.’ Indeed Crowther mentioned the ‘modern literary impressionism’ of John Dos Passos’s *Manhattan Transfer* (1925), the cinema and ‘contrapuntalism’ — ‘whose works consist of series of significant aspects arranged to cause a general effect’ — as similar to his own ‘article technique’. But it also owed much to Aldous Huxley’s *Point Counter Point* (1928), formed of chapters of interwoven storylines that, when combined, created a harmonious whole. Huxley was partly trying to musicalize fiction; one character, a writer, concludes that by alternating themes, novelists could match the feeling and thought contained in something like Beethoven’s Diabelli variations. However, the form of BISRA differed from that of *Point Counter Point* in that it was self-consciously modelled on scientific journalism, and Crowther hoped readers would ‘find some originality in the technique of writing it, or if they cannot do that, they may at least consider it was worth while recalling attention to this technique.’

Crowther believed that BISRA’s story also had some quality, though. It dealt with science, sex and capitalism, though the reader from Curtis Brown (Crowther’s literary agent) suspected ‘that the love story has only been put in to make a novel out of a scientific tale.’ Crowther had two main aims in writing the book: ‘to show scientific discovery as a sort of force which may transform and upset the social order’ and to accurately portray ‘the scientist and his mentality’. The narrative resembled that of Wells’s *Tono-Bungay* (1909). Set in the very-near future, BISRA focused on a number of people associated with British Industries Scientific Research Association (BISRA) limited, a scientific research institute founded during a period of economic decline, when ‘the body of the nation began to breathe heavily, and pant, foreshadowing convulsions... It was then that Science got its chance.’ Eventually, BISRA develops a cancer palliative — marketed and patented as ‘BISRA Cancer Cure No. 1’ by the director — which it administers to patients at a resort. This leads to an industrial revival in Britain, as people come from all over the world to be treated; their healthy relatives ‘turned England

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73 Ibid., 4–6; SxMs29/11/3/11, Crowther to Brentano, 29.7.29.
74 Aldous Huxley, *Point Counter Point* (London, 1928), 408; see also Peter Firchow, ‘Mental Music: Huxley’s “Point Counter Point” and Mann’s “Magic Mountain” as Novels of Ideas’, *Studies in the Novel*, 9 (1977), 533–535.
75 SxMs29/12/39/3, ‘Notes for Preface to BISRA’, 5.
76 SxMs29/12/5/3, Higham to Crowther, 10.2.30.
into a fashionable holiday resort. The French Riviera was badly hit.’ Doctors were the new social ideal: dummy stethoscopes became voguish and ‘The jargon of medicine invaded the language of advertisements and the press’. But the revival, like the Ponderevos’ wealth derived from sales of the fraudulent Tono-Bungay, was founded on an illusion of effective marketing. bisra’s patients’ tumours soon became malignant and secreted a fluid that ‘attacked those parts of the cerebral tissue associated with the mental processes underlying the moral judgment... their behaviour terrified their attendants, several of whom escaped murder by luck.’ Shares in bisra fall, its staff become discontented due to the marketing of the ‘cure’ and potential wage cuts, and Harry Stothers, the most politically-aware of the scientists, eventually takes over bisra.77

Though the plot was Wellsian, Crowther deployed his experience as a scientific flâneur to claim that he could better Wells in the depiction of the scientific life. Hyman Levy (1889–1975), the Marxist mathematician and Crowther’s friend, had written in Nature in 1927 that

> the psychological behaviour of the scientist, his interest, his urges, the material he handles, and the stage he treads, constitute a region into which none other than Wells has dared to enter. Coming to literary work from the field of technical knowledge, Wells has made the amazing discovery that a scientific training, far from being a handicap, is a positive blessing.78

Crowther thought otherwise. Wells ‘was really interested in’ his scientist characters ‘as ordinary humans and not as scientists. They might perfectly well have been plumbers or financiers.’ Even Sinclair Lewis’s recent Pulitzer Prize winning Arrowsmith (1925) was on Crowther’s reckoning ‘written by an author outside the scientific life.’ These authors had failed to capture the distinctiveness of scientists’ psychology. Crowther’s ‘long and wide experience of dealing with scientists’ allowed him more realistically to depict scientists’ ‘real psychology than most other writers on this narrow field of the novel about scientists.’79 So, whereas Crowther may have drawn on Tono-Bungay’s plot, bisra devoted more attention to scientists’ work, describing their laboratory, thoughts and

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77 SxMs29/12/39/2, bisra Ts, 2, 48, 75, 317, 321, 348.  
78 Nature, 8.10.27, 503.  
79 SxMs29/12/39/4, Crowther to Unwin, 21.8.29; SxMs29/11/3/11, Crowther to Brentano, 29.7.29.
motivations in third-person direct narration of the type favoured by Henry James, rather than Wells’s deliberately unreliable first-person. Crowther considered himself well-placed to ‘interpret the scientists [sic] as he is, not as the literary man thinks he is… In short, I have tried to introduce the scientist and his mentality into the novel more fully than has been done before.’

As a format, the novel allowed Crowther to portray the spirit of science and the attitude of scientists in a way that a wholly non-fiction work could not. The omniscient narrator could reveal his character’s thoughts, as when the protagonist notices his female colleague’s ear: ‘definitely more delicately shaped than his memory’s schematic ear.’ Other long, didactic, expository paragraphs describing experiments or scientific equipment could, however, have come from a Manchester Guardian article. The novel was distinctive because it allowed Crowther to show scientists to be uninterested in social affairs or, indeed, general life: Jack Smith, the main character, is someone who has had easy success in life and science, which makes him ignorant of social and sexual questions. His character stood for the ‘Weakness of specialism’; his interest in pure science alone means he is content for non-scientists to run bisra. ‘He stands aside in the struggle.’

The counterpoint to Jack is Harry, a former proletarian who becomes lower-middle-class when he is promoted from the instrument shop to be Jack’s laboratory assistant. Harry is politically aware, and speaks in favour of Indian independence (whereas Jack, revealingly, rarely reads a newspaper). Harry is not just a political contrast to Jack: counterpoint is also used to highlight their contrasting fortunes and lives. Harry’s promotion causes discord in his family life: his wife, Janet, is resentful of him spending so much time on politics, and he has difficulty studying mathematics in his spare time, whereas Jack and Mary do not have domestic chores to worry about. Science, then, is portrayed as a social force

81 SxMs29/12/39/4, Crowther to Unwin, 21.8.29.
82 SxMs29/12/39/2, BISRA TS, 75.
83 SxMs29/12/39/3, Notes.
that upsets the social order in many ways, but scientists largely fail to recognise this.

But was it science itself, or writing about science, that changed society? This question is explored by the introduction of a character, Dawes, who writes for the *Weekly Review*. This technique, of putting a novelist in a novel, who could then channel the author’s opinions, was again clearly borrowed from *Point Counter Point*.84 Dawes discusses science and literature with Jack and Mary at the BISRA health town at Chesil Beach. He notes the difficulty of balancing the ‘lean efficiency’ of weekly essay writing with the desire to write ‘a book which will make an evident deflection in the stream of civilisation.’ As more attention is devoted to the latter, the weekly essays suffer and slacken, until the editor ‘allows you to know your essays have lately not been quite up to the mark’ and Dawes is forced to abandon ‘the wide imaginative continuum’ in favour of ‘the technique of the weekly quantum’ (which supports a house and family). Of course, this critique is embedded in a book that attempts to resolve the dilemma by being based on the technique of essay writing. Similarly, BISRA itself is an answer to Jack’s (and Aldous Huxley’s) criticism that writers usually confine themselves to ‘the same old facts, rattling away with the old dice of sex, career and murder.’ Significantly, though, Jack the scientist and Dawes the journalist agree that writers (such as Rousseau) can indicate the direction of social change, and thereby speed it up. Writers can ‘make an unconscious movement conscious, “Consciousness the Will informing till it fashion all things fair.”’85

In the event, BISRA did not have a chance to make a deflection in the stream of civilization because publishers considered the depiction of the scientific life to be unmarketable; it seemed, with its intrusive, didactic narrator, more like scientific propaganda than a novel. Allen & Unwin, Brentano’s (who published *Science for You* and *Short Stories* in America), and more avant-garde publishers like the Hogarth Press and Victor Gollancz all rejected it.86 Crowther’s literary agent, Curtis Brown, summarized the problem: ‘it is too impersonal and too scientific

85 SxMs29/12/39/2, BISRA TS, 335–346. The quote is from Hardy’s *The Dynasts*.
86 SxMs29/12/39/4, E.L. Skinner to Crowther, 5.9.29; SxMs29/11/3/11, Brentano to Crowther, 1.11.29; see also the correspondence in SxMs29/12/39/4.
and full of scientific detail to interest the average reader. Crowther anticipated this judgement: it was, he said, ‘about what I expected.’ After all, capitalism divided knowledge, as well as labour: in June 1928, Crowther conceded that a civilization based upon the synthesis of art and science ‘may never burst into flower unless it takes root in a better social order than ours.’ Only in a socialist society, where the importance of science was recognized, and where nonspecialists took an active interest in science, would science be seen as a legitimate subject of literature.

But Crowther would have a chance to successfully combine ‘the wide imaginative continuum’ with ‘the technique of the weekly quantum’. *An Outline of the Universe* combined the impressionistic, contrapuntal technique of BISRA with a Constructivist aesthetic, in an attempt to overcome the ‘weakness of specialism’ that BISRA had condemned.

An Outline of the Universe

The manager of Routledge and Kegan Paul, William Swan Stallybrass, commissioned Crowther’s first original book at the end of 1929, after unsuccessfully offering Jeans £750 advance royalties for *The Universe Around Us* (1929). *An Outline* has therefore rightly been regarded as a materialist response to mystical interpretations of science advanced by the likes of Jeans and Eddington. *An Outline* was published under the Kegan Paul imprint, was larger in format than Crowther’s previous books and, at 12/6, more expensive. As the first of Crowther’s books not composed of reprinted articles, he had high hopes for it. He apparently came up with the idea for the book a few years before and had discussed it with ‘a friend at Oxford’ (probably Rowse); he therefore told

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87 SxMs29/12/9/3, Higham to Crowther, 10.2.30.
88 SxMs29/12/9/5, Crowther to Higham, 20.2.30.
89 *Sunday Worker*, 24.6.28.
90 Crowther, *Fifty*, 50.
Curtis Brown it would ‘be the freshest I shall ever write.’\textsuperscript{93} Having a book commissioned and obtaining an agent evidently boded well for Crowther’s writing career, and he immediately reduced his appointment with OUP to half time, to devote more time to writing and travelling. ‘Writing articles in hotel bedrooms, lounges, railway trains, etc. is possible, but a continuous ms would be more difficult to write under these conditions.’\textsuperscript{94} Crowther received £75 advance for the British and American rights each.\textsuperscript{95} An Outline drew upon \textit{BISRA}, and made similar points albeit in altered tones. Jack’s aesthetic opinion in \textit{BISRA} that

> the sight of heaven’s vault dusted with twinkling lights can cause intense feeling for a few moments, but the sight soon satiates me from lack of intellectual variety.\textsuperscript{96}

becomes the narrator’s opinion in An Outline:

> ... the vault of stars is much less aesthetically fascinating than is commonly admitted. How many persons of sound taste could really spend hours every clear night enjoying such vision of the stars perceptible to the naked eye?\textsuperscript{97}

\textit{An Outline} was an epic, a genre well-suited to the impressionistic style of scientific journalism, and contemporaries noted that it had a wider scope than comparable books. In the latter part of the 1800s, the evolutionary epic was one of the more significant narrative forms, one that had been defined by such works as the \textit{Vestiges of the Natural History of Creation} (1844). Nineteenth-century evolutionary epics were sweeping, in terms of their chronological range and (or) the number of disciplines covered, and sometimes contained heroic characters.\textsuperscript{98} \textit{An Outline} similarly began with the creation of the universe and ended with modern society, and covered physics, biology, chemistry, psychology, archaeology and modern society. As advertisements boldly asserted: ‘J.G. Crowther has put the whole universe successfully between the covers of one large volume’.\textsuperscript{99} It was more sweeping than the cosmological epics of Eddington and Jeans, which most

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\textsuperscript{93} SxMs29/12/5/3, Crowther to Curtis Brown, 13.1.30.
\textsuperscript{94} SxMs29/1/3/2/1, Crowther to Milford, 2.1.30.
\textsuperscript{95} See the correspondence in SxMs29/12/5/3.
\textsuperscript{96} SxMs29/12/39/2, BISRA TS, 244.
\textsuperscript{97} Crowther, \textit{Outline}, 9.
\textsuperscript{98} Lightman, \textit{Victorian Popularizers}, 220–1.
\textsuperscript{99} MG, 7.6.31.
\end{flushright}
captured the public imagination in the interwar period, but which generally excluded biology. The reviewer for the *Manchester Guardian* remarked upon the *Outline*’s wide sweep, ‘wider even than that of Mr. Wells and his latest collaborators’ (referring to *The Science of Life*). The chapters of the *Outline* were correspondingly short (54 chapters made 365 pages), like the Science for You series or *BISRA*. The book was explicitly ‘an essay in a craft still sufficiently new to be ill-defined, the craft of scientific journalism.’ By starting with an epigraph drawn from the prose version of Dante’s *Divine Comedy* — ‘I cannot make record of all in full, seeing that my long theme drives me on, so that oftentimes speech comes short of the fact’ — the *Outline* announced the close fit between scientific journalism and the epic. Allying the epic with scientific journalism suited Crowther’s desire to impart the aura of scientific discovery in one impressionistic sweep. Indeed, in scientific journalism, which Crowther defined in one of two prefatory notes, ‘Accuracy of fact is desirable but less important than accuracy of atmosphere.’ Some reviewers saw this as a convenient excuse for inaccuracy, and took the opportunity to point out errors in fact. As in *BISRA*, then, short chapters worked together to produce a bigger theme.

As a work of synthesis, *An Outline* attempted to overcome specialization. As the *Listener* reviewer, the physical chemist A.S. Russell, noted, Crowther looked ‘forward to a time when interests will broaden; when a physicist will be able to express informed views on biology or art and when there will be no tail to the England cricket eleven because bowlers can bat.’ People in Dante’s Middle Ages had a comprehensive view of the world, Crowther thought, and were therefore able to say ‘fairly confidently and clearly’ what the universe was. However ‘During the last four hundred years there has been a reaction from the general to the particular’, so much so that there existed an ‘inco-ordinated pile of knowledge gained by specialization.’ This was no celebration of narrow expertise. Rowse

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101 MG, 26.5.31; see also Nature, 10.10.31, 627.
103 See for example, *The Spectator*, 27.6.31, 1024.
104 *The Listener*, 24.6.31.
105 Crowther, *Outline*, xi.
reminded Crowther that he could have ‘slipped in’ a related point ‘of a Marxist character... it is really your own, wh. came up in conversation here’. The Outline attributed the dominance of ‘the analytical, the concentration on the particular, & in method empiricism’ to the ‘rapid evolution of civilisation’, but Rowse reminded Crowther that it was ‘bound up with the rise of capitalism... with its absolute dependence on specialisation, and its repudiation of a comprehensive view of things.’ The division of labour, the diversification of the economy, had led to the necessity of specialization and technical education. Journalism, Rowse thought, was a reaction against specialization, and Crowther concurred.\(^{106}\) The Outline would therefore help people ‘to relearn the habit of trying to see the Universe. Their data are incomparably richer than those of the Middle Ages and should inspire a more wonderful vision.’\(^{107}\)

This vision emphatically differed from the religious one of Dante, or the likes of Eddington or Jeans. In the nineteenth century, evolutionary epics were either written to endorse religion or secularism, and this remained true in the twentieth. Crowther adopted the epic in order to subvert the idealistic goals of Jeans, Eddington and others, just as writers used it in the nineteenth century to subvert the non-religious aims of the scientific naturalists.\(^{108}\) As Matthew Stanley has argued, debates over mysticism and naturalism had important political implications, and An Outline supports his reading.\(^{109}\) Everywhere Crowther looked, interpreters were referring to the universe, ‘but few have a clear idea what they mean by it.’ Most recently, Jeans had spoken of a mysterious universe, one whose underlying mathematical laws indicated that it was designed. Elsewhere, J.B.S. Haldane spoke about the queerness of the universe.\(^{110}\) Scientific journalists knew better because, once again, their proximity to active researchers allowed them to see that ‘however vitalist distinguished experimental biologists pretend to be, in the laboratory where their fame was achieved they are observed to be

\(^{106}\) SxM\textit{29/12/5/3}, Rowse to Crowther, [1931].
\(^{107}\) Crowther, \textit{Outline}, xii.
\(^{108}\) Lightman, \textit{Victorian Popularizers}, 222.
strictly mechanist.’ When writing BISRA, Crowther’s contact with scientists helped him to understand their psychology; here, familiarity enabled him to understand their metaphysics. ‘The revolutionary, hard and brilliant intellects of Heisenberg and Dirac do not yield mysticism; that is a spurious growth stimulated in uncreative by creative minds.’ As Rowse noted, this was the true intellectual significance of An Outline: ‘you get in a salutary shrewd blow at this bollocks of scientific mysticism’. Throughout, Crowther accordingly dispelled the mystical in terms of natural processes. For example, ghosts were tricks of the mind and matter and mind had a common origin. In obtaining ‘a lucid, accurate, and up-to-date account of the Universe’, readers may form ‘a clearer view of social affairs.’ (fig. 5)

Figure 5: the promotional leaflet for the Outline.

111 Crowther, Outline, xi, xiv, xiii–xiv.
112 SxMs29/12/4/3, Rowse to Crowther, [1931].
113 Crowther, Outline, 344.
An Outline introduced two, related, innovations intended to condition its readers: the Bauhaus aesthetic and Basic English. Crowther began writing the Outline during a lengthy visit to Berlin, where the metallurgist Paul Rosbaud (1896–1963) introduced him to Walter Gropius (1883–1969) and László Moholy-Nagy (1895–1946), respectively founder and former professor of the Bauhaus school of art and design. Boris Jardine has painstakingly unearthed the links between Constructivism and the social relations of science movement, focusing particularly on Bernal and the mid-1930s, remarking — for instance — on the parallel between the srs movement’s equation of pure and applied science and the Bauhaus’s fusion of fine and applied art, and pointing to the shared socialism and functionalism of the movements. However, he overlooks Crowther’s earlier contact with Gropius and Moholy-Nagy, which came (crucially) before 1931, when the Left scientists heard Boris Hessen’s paper and came to regard science as deeply embedded in society (see chapter 4). Crowther’s contact with the Bauhaus, and his integration of its aesthetic in An Outline (fig. 6), suggests that in 1930 Crowther already regarded Constructivist architecture as a prototype of a socialist society. In 1929, Crowther first visited the USSR, shortly after the First Five-Year Plan had inaugurated a period of collectivization and rapid industrialization, which was to be accompanied by a reconstruction of life along socialist lines. Ralph Fox reported from Moscow early in 1930 (six months after Crowther’s visit) on the new communal towns and buildings that were springing up. He predicted that the effects of such a re-ordering of life would be profound: ‘All this means the growing up of completely new kinds of men & women, such as have never before existed. It means the final destruction of the family, religion, drink & prostitution, & it is already beginning to happen.’ A few months later, Fox reported that Hannes Meyer (1889–1954), another Bauhauser, had arrived to superintend construction of the cities. Gropius described his own approach to ‘Democratic House Design’ to Crowther, noting that, in a pre-democratic age, homes were fortresses; in a democratic era,


115 SxMs29/1/4/3, Fox to Crowther, 9.2.[30] and 17.10.[30].
houses should be as open as their inhabitants desired. A few days after Crowther’s article on Gropius appeared in the Guardian, a section on the ‘Miscellany’ page made the link between the Bauhaus and politics explicit. The paper had received a letter from an ‘indignant’ correspondent who suggested that modern architects and artists, like Gropius, should be sacked until they started to use capital letters in their names. In a surely deliberate play on words, the paragraph appeared under the heading ‘anti-capitalists’. Gropius believed that the prospects for the new style of housing were inauspicious in the ‘individualistically conservative’ Western Europe, and he predicted that ‘the Americans will develop this style of modern architecture most successfully.’ The Bauhaus aesthetic, of which architecture was the epitome, promised to condition people with socialist reflexes — by promoting sociability and democracy — in the Pavlovian way that Crowther found so convincing as a method of Socialist renewal.

116 MG, 17.6.30.
117 MG, 13.6.30.
Figure 6: Moholy-Nagy’s dust-jacket illustration. Moholy-Nagy used photography to invoke forms that existed in nature.\textsuperscript{118} The sphere could be a planet, with the lines resembling orbits, or the lines could represent the path of electrons round a nucleus. Crowther thought Moholy-Nagy’s early sketches of the cover were ‘very interesting and in fact more distinguished than the book they are intended to show into the world!’\textsuperscript{119}

The Bauhaus aesthetic had much in common with Basic English, Ogden’s simplified language of 850 words that aimed to improve communication within science and between nations.\textsuperscript{120} Both made scientific journalism ‘impersonal’: Moholy-Nagy’s belief that photography would become the storytelling device of

\textsuperscript{119} SxMs\textsuperscript{29/12/5/4}, Crowther to Rosbaud, 23.1.31.
\textsuperscript{120} Sleigh, \textit{Six Legs}, 154–158 provides a summary of Basic.
the future was embodied in the many photographs and illustrations in An Outline; Basic, meanwhile, reduced language to its barest elements. In an article written on Basic (and in Basic), Jimmy said that all interpreters of science ‘are at pains’ to write in a style similar to Basic ‘more or less unconsciously’ when putting ‘into the limited number of words used by the public ideas for which the language of the expert is normally used.’ A Guardian correspondent thought that the ‘fluency’ of Crowther’s article formed ‘an eloquent tribute to the success of Mr. Ogden’s experiment.’\footnote{MG, 14.7.31.} The Outline also promoted Basic as the attainment of a true plain style, the sort of thing he had been advocating years ago in the Plebs League. Basic was based on the premise that most of language was fictional. Originally, language developed as a replacement for physical reactions to stimuli, but ultimately superseded these reactions to take on a life of its own. Ogden aimed to do away with the ‘fictional’ parts of language, to retain only those words that attached to concrete entities.\footnote{George Wolf, ‘C.K. Ogden’, in Roy Harris (ed.), Linguistic Thought in England, 1914–1945 (London, 1988).} The behaviouristic basis of this should be clear, but the important point is that, by paring language down to its most concrete words it was possible to write clearly, and therefore think clearly. Psyche, the journal that Ogden edited, predictably welcomed the Outline as ‘one of the few works of its kind which stresses the language factor in Life and Science on the lines advocated by Psyche’. The Outline, then, was in harness with the aims of Basic, and Crowther was now the interpreter, the specialist generalist, par excellence: his previous books ‘put him in the front rank of expert interpreters of the experts, and the present work will still further enhance his reputation with the serious public.’\footnote{Psyche, July 1931, 96. Adelyne More, the reviewer, was Ogden’s pseudonym, and I suspect that most of Psyche’s 200–250 subscribers would have known it. For Ogden’s authorship, see W. Terrence Gordon, C.K. Ogden: A Bio-Bibliographic Study (Metuchen, 1990), 96; for subscription figures, see Sleigh, Six Legs, 143.} Concrete language, like concrete buildings, could condition reflexes.

However, we should not assume that the shared aesthetic of the Bauhaus, Basic and the Outline constituted a narrow promotion of science. Though Gropius had called for an ‘architecture adapted to our world of machines, radios,
and fast motorcars, an architecture whose function is clear’, it is important not to neglect the anti-technological roots of the Bauhaus.\textsuperscript{124} Rather than allowing the machine to control humanity, they sought for ways to control the machine. So did Crowther: as he wrote in 1932,

modern industrial society resembles a collection of wonderful engines, all liable to whirr away on their own, without any general control. The present industrial depression is due to defects in the co-ordination of production and consumption; it is a symptom of the engines racing out of control.\textsuperscript{125}

\textit{Psyche} saw Crowther performing an act of benevolence for the sake of humanity: his ‘interests are invariably human, and his humanity is further in evidence whenever technicalities have to be explained to the uninitiated.’\textsuperscript{126} This was no machine-made language, then, but rather the opposite — the return to a humane, natural, down-to-earth form of communication, one that might stop uncoordinated activity from spinning out of control.

For this reason, the third-person impersonality of Crowther’s writing was rhetoric: a plain style got no closer to the transparent truth than one laden with flourishes. As rhetoric, effacing his own authorial presence allegedly let the science speak for itself, which would command assent amongst his readers. However, Crowther’s message on this point was in fact contradictory. If the title of \textit{An Outline of the Universe} was meant to conjure in readers’ minds Wells’s \textit{The Outline of History}, the use of the indefinite article (‘an’) rather than the definite article (‘the’) left room for different interpretations. John H. Bradley Jr., a reviewer for the \textit{Saturday Review}, warned any readers ‘ingenuous enough to hope for an impersonal account of anything’ that they were ‘headed for disappointment here.’ An authentically impersonal book would

\begin{itemize}
  \item \textsuperscript{125} J.G. Crowther, \textit{Industry and Education in Soviet Russia} (London, 1932), 85.
  \item \textsuperscript{126} \textit{Psyche}, July 1931, 96.
\end{itemize}
probably employ symbols rather than words; it will deal little with the rare accidents of life; it will contain no assumptions and no conclusions; it will be so dull to the egocentric minds of men that few if any will care to read it.'

It was because *An Outline* was personal that readers liked it. Rowse noticed ‘all the old humorous touches, distinguished & from an individual angle of vision — as I have always noticed — are there and work in more naturally... They’re worthy of B. Russell!’ According to the *Guardian* reviewer, ‘… art as well as philosophy’ went into the arrangement of the book, the result being ‘creative as well as interpretative. As individual essays his chapters reveal qualities in the author which we have come to expect.’ Together the chapters were ‘an organic sequence, that gave Mr. Crowther his aim and gives the book its chief value.’ Whatever the reader’s ‘scientific attainments’, they would ‘find in this sketch a first-rate provocation to clarity’.

In the final chapter, the pretence of objective impersonality is dispensed with. Adopting an organic metaphor that was prevalent in the early twentieth century, especially amongst socialists, Crowther concluded the cosmic epic by urging humanity ‘to emulate nature and organise his society as efficiently as nature has organised the community of cells in his own body.’ Readers would imagine a clean, non-mystical society in which everyone lived in sanitary Bauhaus-like buildings, which had conditioned reflexes accordingly. For Fox, who had encouraged Jimmy to write a book on science and socialism, Crowther’s ‘plea for a “scientific” outlook isn’t enough. You have to explain what you mean by that, & there the trouble begins.’ The *Outline* lacked ‘a complete philosophy of your own which would give the necessary unity to the book’, though Fox acknowledged that ‘your task is a terribly difficult one. To be a scientific journalist is a cruel task.’

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128 SxMs29/12/5/3, Rowse to Crowther, [1931].
129 MG, 26.5.31, 5.
131 SxMs29/1/4/3, Fox to Crowther, 26.6.[31].
Conclusion

In September 1930, Crowther had a nightmare. Somebody told him what Professor Robert Robinson, the Oxford University chemist, thought about him. ‘I was ridiculed as one of those who talked science without understanding it… “Such Cattle”… he [Robinson] said.’ Crowther noted the dream down, along with others he had that summer, but it would not have taken a psychoanalyst to reveal that it pointed to one of Crowther’s fears: that research scientists thought he merely regurgitated information, a ruminant incapable of ruminating on science — not, in other words, the interpreter he aspired to be.\footnote{SxMs29/9/5/13, “Anyone who attempts to keep a record of his dreams will be surprised by their frequency and variety”, Crowther wrote in An Outline, 343.}

He need not have worried; with the publication of the *Outline*, Crowther had ‘arrived as a writer of popular science’ according to Hogben, writing anonymously in *Nature*. This recognition was not reflected in his financial situation however, which remained precarious.\footnote{Nature, 9.4.32, 525.} Though he claimed not to feel the effects of the depression, copies of the *Outline* languished in shop windows.\footnote{Crowther, Fifty, 68.}

Having sacrificed half of his salary from the OUP, Crowther now had to search for alternative ways to supplement his income. Working full-time for OUP, he had been paid £388 per annum, a salary boosted by £200 from his *Guardian* work and Dora’s £250 per annum school-mistress salary: in all, a comfortable middle-class income.\footnote{McKibbin, Classes, 45.} By 1931, Crowther got £220 per annum from the OUP after reducing his appointment with them, which became his ‘rock-bottom income’.

Thanks to the financial crisis, it was also harder for Crowther to make money by writing. On top of this, Dora and Pauline were unwell which ‘makes risks all the more dangerous, and not fair to them.’\footnote{Dora suffered from ‘two fibrous tumours one large on the outside of the womb & one small inside’ for which she required an operation: SxMs29/1/3/1, Dora to Crowther, 13.2.29. Rowse mentioned Pauline being ill: SxMs29/1/4/3, ‘Friday’. Crowther provided details of his income to Rutherford: SxMs29/1/3/2/3, Crowther to Rutherford, [1931].} Crowther therefore searched for a ‘pot-boiler’, and applied to be Secretary of the Institute of Physics, so that ‘my family and I could face next year with less anxiety.’ Despite his rising reputation as an
interpreter of science, ‘high-grade scientific journalism’ was ‘laborious’ and ‘worse paid than scientific research, which is a surprise to many.’

This chapter has shown how Crowther attempted to define scientific journalism as a distinct specialism that came in many different guises — as edited collection, as novel, as epic. All of these, I have argued, mooted a new, scientifically-aware and class-conscious notion of literary merit. In their innovation, particularly of form, they expressed what it meant to be modern, but they remained socially engaged and accessible — indeed the relentless insistence on simple, concrete language harks back to Crowther’s Plebs days. As we have seen, Crowther then made claims about the merits of his interpreting — that he had a privileged insight into the scientific world and kept his humanistic instincts alive — to build his career. Active researchers should stick to the laboratory, he suggested: if they did not, they risked their scientific careers or gave a wrong impression of what science was about. Scientific journalism required a balanced imagination, one that could translate difficult scientific topics into understandable prose. As we have seen, research scientists and artists both appreciated the literary quality of Crowther’s work, and at least some scientists were swayed by his arguments. Hopkins’s comments, with which we began this dissertation, echoed Crowther’s. From the other side, the Bauhaus artist György Kepes (1906–2001), who assisted Moholy-Nagy in the design of the Outline’s dust-jacket, later claimed Crowther as his mentor, and expressed themes that the Outline enunciated, particularly the inability to see reality as a whole (thanks to specialization). Later, Moholy-Nagy, Gropius, Kepes and Breuer would meet other scientists through Crowther. Overall, then, Crowther put himself in a privileged position at the vanguard of the synthesis between art and science: though he claimed to look forward to a time when physicists could discourse about art, such a comprehensive view on the part of men of science would potentially put Crowther out of a job.

Perhaps unsurprisingly, despite Crowther’s talk of the objective nature of scientific journalism, it was deeply political. Crowther drew on the Bauhaus and

137 SxMs29/1/3/2/3, Crowther to Rutherford, [1931].
Basic to further his project of conditioning, and to promote a wider, non-specialized but materialistic education that was a precondition to remedying social dislocations. Though he dispensed with the jargon of Marxism, this was an attempt to appeal to readers, not an abandonment of politics. However, Crowther largely assumed that science was a force that acted on society: by rendering the forces and the changes they produced in dignified language, he could help to speed up social change. There was little indication as yet of the idea that society could act on and change the character of science. That realization occurred a few months before the publication of the *Outline*, as discussed in the next chapter.
In 1933, Special Branch thought they spotted Crowther at the announcement of the result of the Reichstag fire counter-trial. Contrary to the Nazi narrative, the Communists were exonerated on 20th September in Caxton Hall, and regarded as scapegoats for a crime the National Socialists had committed themselves in order to consolidate their grip on power. This was the line taken by Georgi Dimitrov (1882–1949), one of the accused, at the real trial in Leipzig. He undermined the proceedings and, the charges against him dismissed, he went on to announce, in the summer of 1935, a new line for the Communist Party.¹ To defend the world against fascism, Dimitrov said, ‘popular front’ alliances of anti-fascists of different political outlooks had to be formed. Culture was key to the anti-fascist struggle, and the radical heritage of particular nations was rescued. People like Ralph Fox and the poets Jack Lindsay and Edgell Rickword rehabilitated the British past to show that ‘Communism is English’.² In this chapter, I show that Crowther had an important role to play in the creation of the cultural popular front, particularly through his histories of science, British Scientists of the Nineteenth Century (1935) and American Men of Science (1937). Like scientific journalism, the history of science was to be a guide to action; it could overcome the limits of specialization and assist in the creation of a cultural front against fascism. With Hogben, Crowther sought to rescue an Anglo-American cultural heritage that they thought essential to an English-speaking socialism, distinct from the jargon-laden, Soviet-style Marxism.

The 1930s were a period of ‘increased visibility’ for left-wing scientists, a period inaugurated by the 1931 International Congress on the History of Science. The narrative of the Russian delegation, whose speeches inspired contemporaries including Bernal, Hogben, Levy, Needham and Crowther, has been related in detail elsewhere. Together, the talks exposed Britons to the ideas of Soviet Russia; what was known about the country before 1931 came, as Bernal said, from ‘incomplete or mendacious accounts in the Press and the reports of more or less unqualified travellers’. Those who accepted Marxism in the 1920s, including Crowther, were forced after 1931 to think more about the relations between science and society. Hessen’s paper, which suggested that the social and economic context of the seventeenth century motivated Isaac Newton’s science — that ‘It was the age that formed and found the man rather than the man who made the age’, as Bernal pithily put it — was particularly influential. It was ‘the starting point of a new evaluation of the history of science’, which paid attention to ‘men’s social and economic background’. Following the Congress, Crowther and Hessen corresponded, and Crowther acknowledged his debt to Hessen in his histories of science. Contemporaries came to regard Crowther as a pioneer of the new approach to the history of science.

Historians’ focus on Hessen’s (undeniable) influence is symptomatic of the focus on the appeal of the Soviet Union to the left in the 1930s. Many scientists came to admire Stalin’s approach — based on the planned application of science to social affairs — which meant that the USSR seemingly thrived while Europe succumbed to economic depression and fascism. Crowther in particular has been portrayed as an uncritical devotee of Communist Russia. Less is said here about

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5 *Spectator*, 11.1-31, 43.
6 Ibid.
9 According to Paul Thomas, the economist Geoffrey Crowther lived a double life as ‘Science Correspondent of the *Manchester Guardian* (who was also a de facto member of the CPGB, and who proselytized shamelessly on behalf of science in the Soviet Union’): Paul Thomas, *Marxism and Scientific Socialism: From Engels to Althusser* (London, 2008), 80; ‘a de facto
Crowther’s glorification of the USSR, and more is made of the fact that he chose to write about British and American scientists. Indeed, whereas British scientists’ fascination with Russia in the interwar period has been much commented on, historians have missed the hopes they placed in the USA. Crowther regarded the USA as having promising prospects for science, for his career, and therefore for the future. Symbolically, these hopes were represented by the sociologist Thorstein Veblen (1857–1929) taking a seat beside Hessen as one of two main influences for *American Men of Science*. This ‘Western turn’ is surprising and significant, because the interwar left tended not to think highly of America: on the whole, socialists condemned the country as an example of laissez-faire capitalism gone wild. Critics also commented on the Americanization of culture, and not in positive terms. Even the New Deal was more likely to be admired by liberals (like John Maynard Keynes) and advocates of a ‘middle way’ than by Marxists, who largely scorned attempts to reform capitalism and saw the risk of the New Deal sliding into fascism. There were exceptions, such as Harold Laski, a Marxist who also had complimentary things to say about the New Deal (especially after its more radical shift from 1935, and after Roosevelt seemed willing to resist fascism). Crowther’s ‘Western turn’ therefore complicates our understanding of his politics, as we see him contemplating an alternative to Communism on the one hand and Fascism on the other. It can be dated quite precisely: in January 1936, he began to read about the USA in the British Library. Not coincidentally, over the previous few months, Crowther had begun to feel disillusioned with the USSR’s treatment of scientists.

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10 Werskey, for example, does not mention the USA.
12 There are many examples. See Chris Waters, ‘Introduction: Beyond “Americanization”: Rethinking Anglo-American Cultural Exchange Between the Wars’, *Cultural and Social History*, 4 (2007), 451–454 for a summary. As Waters notes, Anglo-American cultural exchange in the interwar period was more complex than is commonly portrayed; Crowther’s engagement with the US and his attempts to shape British perceptions of American science confirms that people made engaged attempts to understand the country, beyond negative stereotypes of ‘Americanization’ and gangsters. For a summary of English perceptions of America in the period, see McKibbin, *Classes*, 523–527.
No matter how inspiring Hessen’s paper, a four-year gap existed between the 1931 Congress and Crowther’s first history of science — he wrote two full-length books, edited a further two, and wrote numerous articles in the meantime. These years saw Crowther consolidate his reputation amongst practising scientists. Before turning to Crowther’s assassination of nineteenth-century British scientists and his appreciation of America, the first section of this chapter therefore traces Crowther’s rising prominence in the period between 1931 and 1934, which mirrored, and shaped, the rising acceptance of Marxism and the corresponding decline of idealism (as purveyed by Jeans and Eddington). This section also demonstrates that Crowther was unwilling to adhere to the CPGB’s class-against-class policy. Hogben is a point of contrast throughout — though he and Crowther had similar beliefs on the form that political activity should take, their conduct totally differed. Despite having, by 1934, confirmed his career and reputation as a scientific journalist, Crowther still felt the need to mask the subversiveness of British Scientists when it appeared in 1935.

Crowther’s Rising Reputation

By 1931, Crowther’s old Marxist friends were gravitating towards London. Rowse, now Labour Party Parliamentary candidate for Penryn and Falmouth, became a lecturer at the London School of Economics (LSE) in 1930. Hogben had been in Canada and Cape Town since 1925. He and Crowther stayed in touch, with Hogben confiding to Crowther that he hated South Africa: ‘a semifeudal society with a white “Labour” bureaucracy’ where ‘any sentence which I might write to any body involving the word native lays me open to deportation’.¹⁵ Out of all the Visible College members, Crowther was arguably closest to Hogben who also joined the LSE in 1930, to take the Chair of Social Biology. Rowse and Hogben arrived at the height of the class-against-class period (1928–1935), when the CPGB denounced all others on the left as social fascists. There is no evidence that Crowther was a party member at this time, and he freely consorted with

¹⁵ SxMs29/1/3/1, Hogben to Crowther, 12.12.27.
non-Communists. Even some paid-up members, notably Dobb, pushed against the walls of party policy, for example by speaking on the BBC and writing about agricultural collectivization for the *Manchester Guardian*.16

In 1931, Rowse wrote to Crowther that the combination of Crowther, Dobb, Hogben and himself would form ‘a not inconsiderable brig’ for Marxism.17 Rowse’s own contribution, *Politics and the Younger Generation*, appeared in the same year, and Crowther’s reaction to it, detailed in a letter to Rowse, is instructive. According to Crowther, revolution might have suited the unsophisticated Russians, but it was beneath the British. Indeed, from Crowther’s point of view *Politics* dealt with British life in a way that was ‘exceptionally exact and free from phantasy.’18 In other words, from the psychoanalytical perspective that Crowther’s language implied, Rowse did not indulge in daydreaming.19 For the ‘outstanding merit’ of *Politics* lay

in the determination to discuss all facts rationally, and avoid repeating the accepted abstract cliches. This realism leads to conclusions which will disappoint many readers. The rational insistence on the strength of Britain and the cool discussion of the facts will be disturbing to pacifists [sic] and abstract revolutionaries. [sic]

Crowther predicted that ‘pacifists and communists’ would ‘roundly abus[e] the book’, and he was right. Prince D.S. Mirsky (1890–1939), Communist and sometime lecturer of Russian literature at the University of London, denounced the intelligentsia of Great Britain in his book of the same name, written during the class-against-class period but not published until 1935.20 In this ‘viciously malignant book’ (Orwell), Mirsky regarded Rowse as ‘a right social fascist’ who advocated ‘a labouristic fascism.’21 There was no indication here, at least, of

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17 SxMs29/12/5/3, Rowse to Crowther, [1931].
18 EUL MS 113/3/1/C, Crowther to Rowse, 29.11.31.
19 According to the OED, in *Psychoanalysis for Normal People* (1926) Geraldine Coster defined phantasy as ‘a day-dream in which desire, unfulfilled in the world of reality, finds an imaginary fulfilment or satisfaction.’
Crowther’s forecast that Rowse’s detractors would soon realize ‘that new lines of attack’ had been opened, and would therefore borrow ‘a lot of particular arguments from it.’ Though Crowther did not think Rowse’s diagnosis was perfect — Rowse had been in Oxford for almost a decade, and it showed — it is clear from these comments that Crowther did not associate himself at this juncture with Communists, whom he conflated with abstract revolutionaries who were unable to face up to the facts. In particular, they were unable to acknowledge, as Crowther could (in private, if not in public) the continued strength of Britain. This strength conflicted with the Communist International’s confident belief, advanced during this period, that the global economic crisis had left the door open for revolution. But a sober assessment of the situation revealed to Rowse and Crowther that revolution was hardly feasible.

Though the Visible College did not become prominent as the voice of the scientific left until the latter half of the 1930s, some attempted to come together as early as 1931, when Dobb tried to unite the left, and the sciences and the arts, under the banner of a new journal. By August, the prehistorian Vere Gordon Childe, D.S. Mirsky, Bernal, Piero Sraffa and Ivor Montagu had joined the advisory circle of contributors, and Haldane and Hogben had, as Dobb told Rowse, ‘expressed a provisional sympathy.’ Dobb hoped to include Crowther, and approached Levy, Tom Driberg, Bronislaw Malinowski, Peter Kapitza, G.P. Wells, Blackett, and Rowse. Publication was pencilled in for January 1932, and may have included an article by Mirsky on aesthetics, something by Haldane or the Russian physicist Joffe on science and planning, and an article on Jeans and Eddington or the History of Science Congress. Dobb also asked Rowse to ‘do a brief survey of the bankruptcy of most current historiography, critically mentioning the falsifying of historical & political theory by authoritarian concepts & notions’. A regular section of “Reviews and Chronicles” would

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22 EUL MS T 3/3/1/c, Crowther to Rowse, 29.11.31.
24 Werskey, Visible, 149–150.
feature ‘one person (or a pair) to each section (biology, physics, art, theatre, film, history etc.) developing a viewpoint through a series of critical notes.'

Dobb thought that the journal had ‘a very definite role... to play at the present juncture.’ Discussions about the journal occurred as the British economic crisis turned to political crisis over the summer of 1931. At the end of August, after disagreements over reductions in spending on unemployment benefits in order to deal with the deficit, the Labour Government collapsed, and MacDonald formed a National Government, a move widely seen as a betrayal by the Left. In this context, Rowse told Crowther that the journal was ‘terribly badly needed, to stay something of the dry-rot of this sentimental religiosity that spreads over the contemporary mind.’ The journal had the potential to rally the left, and provide rational Marxist insight into contemporary affairs. For now, however, Crowther held aloof — he was in discussions with Heinemann about starting a scientific journal along the lines of the Realist (which had folded in 1930) and worried about backing a loser.

As it turned out, the composition of the editorial board proved a stumbling block. Crowther wanted Hogben to be sole editor, and Rowse agreed that ‘he’s much more the sort of mind with the flash, more independent and would give the thing a real character.’ Rowse clearly worried that Dobb’s CPGB membership would make the journal subservient to the Party. Dobb assured Crowther that it would not be an outlet for a clique: presumably, he meant neither for the CPGB nor for scientists. This was disingenuous, because though he certainly wanted to avoid the scientists dominating the project, he also worried about CP members losing control. As he said to Rowse, the scientific group

rather want to have it all in their own hands, fear that science will be too little represented etc. This is untrue of course — scientists will have a big pull in the thing, & among the names of supporters, they bulk very large at present. And I certainly don’t think they ought to have the major pull, because after all they are inclined, like Plymouth Brethren, to think they’re the only people in heaven & earth — rather more than most of us do.

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25 EUL MS113/3/1/1, Dobb to Rowse, 10.8.31.
26 Ibid.
27 Clarke, Hope, 150–159.
28 SxMs29/1/4/3, Rowse to Crowther, [September 1931].
Hogben had ‘many excellent qualities; but he’s inclined to turn down anything as “metaphysics” that hasn’t got a statistical correlation on each page; & if he could help it, he wouldn’t have truck with us Oxford & Cambridge folk who don’t work with our hands (by which he means dissecting rabbits).’ When Dobb met up with Hogben, Levy, Crowther and A.L. Bacharach at the beginning of September, ‘an editorial triumvirate’ of Mirsky, Levy & Dobb was proposed. Dobb considered Levy ‘the most catholic of them… & therefore easiest to work with.’

It also possibly helped that he had recently joined the CP.

Dobb wanted Crowther to be involved in the project, as he told Rowse, ‘both for the value of his scientific contacts & his expository style.’ But Crowther outlined to Dobb ‘3 serious practical weaknesses’ to the project and made ‘inside hints about some of the collaborators’. None of these objections were made explicit, but Crowther evidently wanted more well-defined plans before committing to the project, so he pulled out. Such disagreements must have confirmed Dobb’s belief that he could not ‘see myself quite working in harness with’ Crowther as editor (an alternative Rowse proposed). Besides, Dobb confided in Rowse:

> I don’t think his standing among scientists is quite strong enough as yet. I may be unduly influenced by the attitude of one certain Cambridge scientists who are undoubtedly giving vent to professional snobbery. But I gather they still regard him a little as merely a scientific journalist & the representative of a publishing firm.

The word ‘merely’ here is revealing of the wide scope of Crowther’s ambitions, that were not accepted by all Cambridge scientists, influenced perhaps by the irritation he had caused as an OUP editor. Nevertheless, if Crowther’s standing was not strong enough for him to be editor, Dobb realized that Crowther’s contacts, such as they were, were invaluable. By November, ‘In view of the differences of opinion as to the nature & role of the magazine, e.g. Hogben etc’, Dobb informed Rowse that he had decided to postpone publication of the

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30 Werskey, Visible, 144.
32 SxMs29/1/3/2/3, Dobb to Crowther, 15.9.31.
33 SxMs29/1/3/2/3, Dobb to Crowther, 22.9.31.
journal. The CPGB also criticized it, as they did Dobb’s other suspiciously bourgeois actions, and the idea came to dust.

Dobb’s remark indicates that some of the Oxbridge old guard continued to look down on Crowther, but his wider reputation was rising. The working-class author Lionel Britton (1887–1971), who had just published *Hunger and Love* (1931), complimented Crowther for the *Outline*. More significantly, Julian Huxley acknowledged Jimmy’s expertise when he asked him to ‘look over the articles I have been writing for the *Times* and *Nash*’s. One is so likely after such a short time to make some stupid mistake, and I do not want to be taken to task over trivial matters. In 1932, Crowther’s early announcement of the discovery of the neutron proved a boost: he seemed to Anna Kapitza to have ‘a marvellous intuition about scientist. [sic] The article about Chadwick was the one that all the newspapers of the world could do nothing but copy!’ Meanwhile, Ogden reported that ‘your fame as Basic Scientist is also spreading.’ Ogden duly rushed *Osiris and the Atom*, the final book in the ‘Science for You’ series — which included Crowther’s articles on the neutron and Basic English — through the press. *Osiris* also aimed to plug the gaps in Crowther’s circle of science contacts.

When Rowse received the book he wondered whether an article on the Siberian meteorite, which ‘was a good deal noticed’, would have been better as the title piece. Crowther admitted that ‘From the selling point of view’ Rowse was ‘probably right’, but explained that the title had done its job:

> It has hit [Grafton] Elliot Smith in the eye. [Solly] Zuckerman told me Smith asked him the other day: “Do you know anything of a man named J.G. Crowther. I want to know more about him.” “Do I know C.” Zuckerman replied: “Why, he is the man who knows all the scientists in Europe!” Hogben is giving a dinner party for me to meet Smith. So the “Osiris” part of the title has had its effect.
The intended outcome was to solidify Crowther’s reputation as someone who specialized in being a generalist, able to write about physics and archaeology under one cover.

At such meetings, Crowther evidently tried to impress: Hogben did not, and reactions to his behaviour highlight the importance of Crowther’s tact and sensitivity when it came to associating with practising scientists. Hogben’s problem was that he exposed himself, whether literally or not: the physicist C.G. Darwin (1887–1962) told Rowse that ‘everybody’s objection in Edinburgh for him, was that he wd insist on taking down his trousers in public: a very exact description of Hogben’s progress through life.’ Hogben revealed his state of mind at Edinburgh, which perhaps contributed to his strange behaviour, to Huxley in a torrent of near-suicidal emotion. His social marginality had forced him ‘to the edge of a nervous breakdown’. Only Enid knew how the loneliness had ‘eaten me away’; there was nobody with whom he could be ‘spiritually — I am too miserable to be a behaviourist tonight — intimate’; ‘every single individual seems so utterly foreign and hostile’; he felt ‘hunted down and backbitten because [he] privately entertained views in 1918 that most people were accepting from their daily papers in 1924.’ Shunned, perhaps, as a conscientious objector, Hogben showed his buttocks to what he later described as ‘a highly inbred élite which preserved… a social tradition of pervasive Victorian propriety and Victorian pomposity’. Now that Hogben was in London, he was testing Rowse’s patience. At a ‘Zuckerman dining-chat’ Hogben ‘annoyed’ Rowse ‘intensely’ by taking him up ‘for bad grammar or using slang.’ Rowse ‘determined to say nothing at all; and then Hogben wouldn’t speak! He is a childish person’. Hogben was also ‘a damn sight too interested’ in Rowse’s politics, a lapse of etiquette too far: ‘I know perfectly clearly what I am doing in that respect, and also, rather more clearly than he does, why I am doing it.’ As far as Jimmy was concerned,

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42 SxMs29/1/4/3, Rowse to Crowther, [1932].
43 JHP, Box 8, Hogben to Huxley, 2.4.25.
44 Hogben, Hogben, 80–81.
45 SxMs29/1/4/3, Rowse to Crowther, [1932].
a person of such emphatic psychological personality as Hogben is bound to be odd. I find the best way of dealing with him is just to ignore his fantastic performances. These occur when he is self-conscious: when he forgets himself & becomes interested in something he suddenly changes into a natural & charming being. Besides, his gifts are so great that patience with his weaknesses is worth while. Tough consistency is not his quality: he is a sort of journalist of the scientific intellect as Shaw is of the social intellect.

Hogben had reviewed Crowther’s *Industry and Education in Soviet Russia* in *Nature*, and ‘many people have spoken to me of it, & even written from America about it.’ Here was evidence of his ability to successfully convey ideas. To claim, as Rowse did, that Hogben was ‘incorrigible implies that he ought to be turned into something else, but if he were he would probably lose his good besides his bad qualities.’ Hogben’s uncouth behaviour, then, was a problem independent of his politics, since Rowse — who was in broad sympathy with Hogben’s politics — complained about his conduct. It stemmed, as Crowther’s comment about Hogben being ‘self-conscious’ implies, from his social and working-class background.

In this exchange about Hogben, Rowse had enquired after Dora. Crowther overlooked the query: perhaps he forgot, or maybe he did not want to discuss his failing marriage. A few months later, at the end of 1932 during a visit to Kharkov, Crowther met Franziska Zarniko (1907–1983?). Franziska, an aspiring German filmmaker and brother-in-law to the physicist Kurt Mendelssohn, knew Moholy-Nagy and lived with the chemist Martin Ruhemann (1903–1994) and his wife Barbara as a nanny. Jimmy was immediately struck by Franziska’s ‘eyes & charm’, as he recorded in his notebook, when she opened the door to Martin and Barbara’s flat. Crowther made a comparable impact on Franziska, disrupting her life as “aunt” to the Ruhemanns’ child:

> Before you came here, I was quite calm, because I had forgotten, that I had an own life, but now, I am so restless and nervous, my work don’t employ my mind, I am ever alone and must think too much and that is so bad for me.

46 EUL MS115/3/1/c, Crowther to Rowse, 30.6.32.
47 SxM529/2/3/2, Notes Oct 26–Nov 9.
48 I have left Franziska’s imperfect English intact, rather than pepper each quote with [*sic*].
She thought that ‘this everyday-the-same-life is so tedious — that is good for old people!’ After Crowther left Kharkov, they got to know one another from afar: Franziska could be found in the evenings ‘deeply engrossed’ in the literature Crowther sent from England, and Franziska soon got used to the nickname ‘Jimmy’.\(^\text{49}\) In Crowther’s letters Franziska found ‘much what I like and I think I know you much better now and also I think I would be glad to meet you again.’ She kept a picture of Jimmy but returned one of Dora and Pauline. Dora looked ‘like a very good mother and housewife, but I understand that you dont very harmonise.’ Crowther soon invited Franziska to England, ostensibly to help with his German correspondence, but shortly after she arrived in February 1933, Dora and Jimmy divorced.\(^\text{50}\) One benefit of not being a Cambridge don now revealed itself: rather than having to deal with the prospect of losing institutional positions, Crowther merely had to cope with Anna Kapitza’s quip that he had ‘acquired really Russian habits. Well I hope you both will be happy together.’\(^\text{51}\)

They clearly were happy. When Crowther was away travelling they corresponded, and Franziska derived comfort from his letters. They shared a commitment to left-wing politics, and discussed developments in Europe. Franziska thought the Austrian Civil War ‘shameless, although I must say I rather admire the Socialists for not being such cowards as the German ones.’\(^\text{52}\) Franziska and Jimmy married in March 1934.\(^\text{53}\) Hogben was delighted that Franziska had ‘conferred on my native country the distinction of accepting its citizenship by marriage (a Yorkshire man is near enough to an Englishman to be taken for one)’ and noted that ‘Jimmy has looked much happier and more carefree since you started organising his morals. So as I love Jimmy I hope you will go on doing so.’\(^\text{54}\) Franziska managed much more than Crowther’s morals. She taught him German; translated German and Russian books; and proof-read, typed and

\(^\text{49}\) SxMs29/2/3/2, Ruhemann to Crowther, 7.11.32 and Franziska to Crowther, 9.12.32.
\(^\text{50}\) SxMs29/2/3/2, Franziska to Crowther, 15.12.32 and 9.12.32.
\(^\text{51}\) Haldane and Dobb both experienced difficulties due to divorce: Werskey, \textit{Visible}, 84; Shenk, \textit{Maurice}, 67; SxMs29/1/3/2/5, Kapitza to Crowther, 17.5.33.
\(^\text{52}\) SxMs29/1/3/2/6, Franziska to Crowther, 14.2.34.
\(^\text{54}\) SxMs29/1/4/3, Hogben to Franziska, 10.2.34.
prepared the indexes for his books (for which he paid her).\textsuperscript{55} There is fragmentary evidence that her contributions were even more substantial than this, and from 1933 Crowther’s work bore her elusive stamp (as Crowther privately admitted, as we shall see).

Meanwhile, Crowther kept his pen to paper. Reviewers saw his \textit{Progress of Science} (1934) as pointing to the eclipse of Jeans’s and Eddington’s idealism and as a clear example of the full-time scientific journalist tending his craft with more skill than dilettantish research scientists. Levy, reviewing in the \textit{Literary Guide}, thought it was Crowther’s ‘best book’. Science conquered mysticism, but it was only possible to ‘appreciate how great are the inroads man has made on the uncharted territory that surrounds him’ after ‘scientific surveyors like J.G. Crowther set up their scientific theodolite and range the boundaries’.\textsuperscript{56} Other Marxists praised \textit{Progress} for uncovering the flaws in Nazi science. ‘The chapter on heredity is particularly important’, the \textit{Daily Worker} reviewer said, ‘because it is on a basis of the theory of hereditary superiority, which is here shown to be scientifically untenable, that is built the Fascist justification for capitalism and war.’\textsuperscript{57} \textit{Plebs} predicted that ‘the sections on Biology, and the essay on Science in the USSR will be of especial interest’ to socialist readers, as the discussion of heredity ‘shows clearly how, in such a question, scientific opinion is influenced by class interest.’\textsuperscript{58}

Praise was not confined to radical readers, though. Even the \textit{Spectator} wondered whether a better popular science book had ever been written: it was a ‘Grade A’ egg.\textsuperscript{59} In the \textit{Listener}, the physical chemist A.S. Russell called it ‘an important and valuable book’ that displayed ‘talent and experience’ in discussing latest research. \textit{Progress} was not ‘over “popular”; it is, indeed, still a little too much on the academic side.’ Crowther was nevertheless ‘clear, accurate and fair… Chiefest of all he has real perceptions of what is important.’\textsuperscript{60} The physical chemist Michael Polanyi (1891–1976), whom Crowther had met in Berlin and

\textsuperscript{55} EUL MS 113/3/1/c, Dorothy Crowther to Rowse, 13.3.62.\textsuperscript{56} \textit{Literary Guide}, June 1934.\textsuperscript{57} \textit{Daily Worker}, 25.4.34.\textsuperscript{58} \textit{Plebs}, May 1934, 114.\textsuperscript{59} \textit{Spectator}, 27.4.34.\textsuperscript{60} \textit{The Listener}, 11.4.34.
since become friendly with, wrote in a letter that the book was ‘marvellous’. He suspected that Crowther got

out more fun of science than we specialists do prodding along some narrow and steep line. Perhaps you feel that you have to make up for this advantage by letting me have your book. I will derive consolation from it on evenings when I feel depressed about the limitations of spezialisten-zum.\(^{61}\)

Here, once again, we see the defects of specialization, and Crowther’s role in overcoming them; this shared worry was common to Crowther and Polanyi, despite their differing politics.\(^{62}\) William Kerr informed Crowther that he had ‘heard others talk in a high spirit of admiration for your powers’ — with Progress Crowther had ‘now fully achieved your ambition to create a place for yourself as an exponent of scientific work and results — and their meaning.’\(^{63}\) As W.T. Astbury, Lecturer in Textile Physics at Leeds University, put it, ‘At this rate you are rapidly becoming the liaison-officer “par excellence” between high-class science and the yearning multitude.’\(^{64}\) But W.H. McCrea, astronomer and mathematician, expressed scepticism in the *Mathematical Gazette* over Crowther’s aim of making people think scientifically: this goal ‘cannot be attained by means of popular accounts such as this book provides, but only through the discipline of a full scientific training.’\(^{65}\) Only the bracing, direct experience of a laboratory could inculcate scientific ways of thought. Nevertheless, several universities recommended *Progress* as reading to students, presumably as a way for them to become up-to-speed on recent research — but if this is a mark of Crowther’s rising reputation amongst practising scientists, the 12/6 price made it too expensive for most students (and, we may assume, many others).\(^{66}\)

The *Daily Worker* detected hints of ‘dialectical materialism applied to scientific discovery’ in *Progress* — that universities recommended such a book indicates that left-wing opinions were aired more freely in the 1930s.\(^{67}\) Indeed,

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\(^{61}\) SxMs29/12/8/2, Polanyi to Crowther, 8.3.34.

\(^{62}\) Nye, *Polanyi*, 218–221 for other commonalities between Polanyi and Left scientists.

\(^{63}\) SxMs29/12/8/2, Kerr to Crowther, 19.3.34.

\(^{64}\) SxMs29/12/8/2, Astbury to Crowther, 8.1.34.

\(^{65}\) *Mathematical Gazette*, October 1934.

\(^{66}\) Records of Routledge & Kegan Paul, University of Reading Special Collections (henceforth RKP) 38/2/1, David Higham to T.M. Ragg, 27.5.36.

\(^{67}\) Thomas, *Marxism*, 78.
thanks in part to Nazi persecution of Jewish scientists, the likes of Bernal and Blackett came to argue that scientists should attend to the social responsibilities of their work. Hogben committed himself to undermining the scientific basis of eugenics in these years, which left him vulnerable to attack on the grounds that he neglected scientific research. Indeed, Crowther thought ‘that there seem to be some misconceptions about Hogben’ after a conversation with A.V. Hill at the end of 1934. Crowther therefore wrote to Hill in a letter marked confidential, to reassure him that though interested in politics, Lance gave ‘virtually no time to it.’ He spoke on politics rarely, though ‘when he does speak, he usually says something that is remembered,’ giving people the wrong impression. In fact, Hogben was more interested in mathematics:

I may mention in confidence (because he would be furious if he knew that I had told anyone) that he has written during the last six months a large book on the history of mathematics & its relation to social & biological history. I feel I must tell you this, as the belief that he gives much time to politics may be doing him harm.

Indeed, Hill had noted in 1933 in *Nature* that politically-engaged scientists were rarely elected Fellows of the Royal Society. Jimmy also evidently thought that Lance’s behaviour might be harming him. Tantalisingly, he wrote, but subsequently struck out, that ‘I have had special opportunities of seeing him at close quarters, & I know he can be…’

Hill was relieved to hear that Lance’s ‘heart is still in science’ and ‘that he avoids getting mixed up’ — here Hill added ‘too much’ in pen — ‘in politics, and I only wish he could get back to a position in which he could devote himself to what he is good at, namely experimental zoology.’ For Hill, scientists should stick to science: ‘scientific distinction does not give a man any qualification at all for pronouncements on politics, any more than distinction in politics gives a man a right to lay down the law about science.’ Of course, as citizens scientists could have political views, but Hogben risked his scientific reputation by yoking his politics to his science. ‘… we should not mortgage our scientific reputations to claim an importance for our views on politics which they don’t possess.’ Hill

69 SXMS29/1/3/2/6, Crowther to Hill, 25.10.34.
urged Crowther to persuade Hogben to get back to experimental zoology. Lance was ‘out of place at the LSE’ and ‘His amateur interest in genetics is no doubt praiseworthy but I don’t gather that it is regarded very seriously by the professionals.’

For Crowther, Hogben’s genetic work was an example of how socialist scientists should behave; his work exposed ‘errors in science which are quoted in support of reactionary politics’, thereby undermining those politics. Crowther considered other scientists, who were turning to active politics in their spare time, to be ‘juvenile.’ So, in some respects, Crowther agreed with Hill. But something deeper was at issue here. The necessary qualities of a social biologist that Crowther publicly cited in *Progress of Science* — namely wide knowledge and experience of different classes — were precisely those that Crowther wished to inculcate in himself and, by implication, in other scientists. They were the opposite of narrow specialism, and this disagreement over the character of a scientist would come to a head during World War II, as we shall see in the next chapter, where Hill was one of Crowther’s main opponents. For now, as Crowther’s acting as an intermediary between Hogben and Hill demonstrates, Crowther had successfully negotiated his professional and his political commitments. By 1934 Crowther had established himself amongst scientists (of varying political stripes) and more widely for his interpretations. At least part of the explanation for this rests on Crowther’s conduct, which contrasted with that of someone like Hogben, whose behaviour acted as a magnet for controversy. As I have argued, Hogben’s behavioural issues were a problem independently of his politics, as he managed to irritate leftists like Rowse; they stemmed instead from his social and class background. Crowther’s good manners and relatively muted politics combined to allow him to curry favour with eminent scientists.

However, the rise of fascism demanded a response. As Hogben worked on *Mathematics for the Million* (1936), Crowther also turned his pen to a ‘Solid and scholarly’ demonstration ‘of the relations between science and social affairs, so

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70 SxMs29/1/3/2/6, Hill to Crowther, 26.10.34.
72 Quoted in ibid., 149.
that scientists may be convinced of the need for taking an active and progressive interest in politics for the sake of science.\textsuperscript{74} It was time to shake scientists out of their complacency.

Assassinating British Scientists

Crowther had been thinking of writing a history of science for years. In 1931, he told Rutherford that he would need at least two years, though ‘the subject is worth twenty.’ Before the financial crisis in August of that year, he may have secured £300 advance from ‘an enterprising publisher’, but that was now out of the question. He also had in mind, amongst other things, ‘a book on the Personalities of Science’; nor had he given up on producing a study of ‘the psychological atmosphere of a laboratory.’\textsuperscript{75} The history of science, though, came first on his list of prospective projects.

Biography could potentially draw together all these interests. By the mid-1930s, biographies modelled on Lytton Strachey’s sardonic Eminent Victorians (1918) had become an established, and quite popular, genre. Authors like Virginia Woolf and E.M. Forster attempted to make biography into a more artful endeavour, distinct from the monotony of Victorian biography.\textsuperscript{76} In Orwell’s Keep the Aspidistra Flying, ‘smart pseudo-Strachey pre-digested biographies’ occupied the shelves at eye-level in the bookshop in which Gordon Comstock worked, suggesting that they were popular but slightly hackneyed by 1935. Comstock sneered at these ‘Snooty, refined books on safe painters and safe poets by those moneyed young beasts who glide so gracefully from Eton to Cambridge and from Cambridge to the literary reviews.’\textsuperscript{77} Crowther’s biographies would buck the trend: snooty, certainly; refined, probably; but the subjects would be far from safe, and the author hardly glided gracefully from Oxbridge to literary fame.

\textsuperscript{74} Quoted in Werskey, Visible, 153.
\textsuperscript{75} SxMs29/1/3/2/3, Crowther to Rutherford, [1931].
\textsuperscript{77} George Orwell, Burmese Days, Keep the Aspidistra Flying, Coming Up for Air (New York, 2011), 258.
Above all, the predictability of these biographies provided a wonderful disguise for the subversive Marxism of British Scientists. As Gerald Heard — interpreter of science and former editor of the Realist — said in the Sunday Times, on first appearance the book ‘exhale[s] stability’. It dealt with distinguished physicists — Humphry Davy, Michael Faraday, Lord Kelvin, James Joule and James Maxwell — rather than controversial biologists, and Heard could see an uncle giving the book to a youngster whom he ‘would like to interest in truth and also guard from subversive enthusiasms.’78 The octavo book, published by Kegan Paul, certainly appeared to be respectable, and in line with Crowther’s previous books: it cost 12/6; the dust-jacket featured a modest illustration of scientific apparatus; and the text was jargon-free and contained portraits of its upright subjects. The list of further reading recommended W.C.D. Whetham’s History of Science (1929) and Philip Lenard’s Great Men of Science (1933). Both of these authors believed in genius: Whetham voiced opposition to Hessen at the 1931 Congress and his book contained traces of its author’s former role as proselytizer for eugenics; Lenard was a Nazi.79 Crowther’s inclusion of these books did not signify support for their theories. Given its packaging, topic and marginalia, then, readers would not have expected the book to be subversive. However, it was. Crowther, like Bernal, took from Hessen the idea that science was immersed in, and connected to, other aspects of culture, such as art and religion.80 Hence Crowther drew upon R.H. Tawney’s thesis on religion and the rise of capitalism, and devoted attention to contemporary developments in art. This was not, in other words, the primitive determinist history of science as portrayed by Cold War conservative historians.81 Indeed, contemporary reviewers noted that Crowther had an equivocal relationship with Marxism. Heard wrote that readers would soon find that the book was not simply ‘Science without tears’, but ‘even more Biography without Smiles.’ Where once there was ‘Catholic

78 Sunday Times, 19.5.35.
81 Mayer, ‘Setting’, 50.
Truth’, ‘the other side’ promulgated ‘Marxian Truth.’ Crowther’s book ‘does not maintain that, but it is greatly influenced by such advocates.’ C.H.L.’ wrote in the Guardian that ‘The author’s view on the contributions of science to industry and to social life appear tinged by opposition to capitalism’; Crowther’s ‘view appears to be that any contact of science with capitalism is bad for science, for scientists, and for humanity.’

The Marxist influence, for Heard, meant that Crowther turned Samuel Smiles’s concept of self-help upside-down. Crowther was morally censorious, and none of the physicists were portrayed in a positive light: ‘It is not a scientific, but a moral work.’ Indeed, reviewers commented on the morally judgmental aspect of British Scientists as much as its Marxist slant. David Garnett, for example, an eccentric member of the Bloomsbury group (who had studied botany), writing in the left-of-centre New Statesman, compared Crowther with the character Eugene Lvov from Anton Chekhov’s Ivanov (1887). Lvov constantly moralizes and judges other characters, especially Ivanov. Garnett wanted to echo Ivanov’s words to Crowther, a modern Lvov: ‘there are too many wheels and screws and levers in any one of us for us to be able to judge each other from two or three external signs…’ Crowther was ‘absorbed by blaming vice and praising virtue’ according to Garnett, particularly when it came to social and economic injustice; hence Crowther did not reprimand Davy for using nitrous oxide on his own toothache without realizing its wider application, because it only resulted in human suffering. But even Garnett admitted that Crowther’s Marxism brought ‘out fresh and interesting angles in his subjects’.

British Scientists was therefore subversive due to its Marxist flavour, and because it undermined the sacred status of men of science, who were after all merely humans, conditioned by their environment.

Garnett’s choice of language, when talking about judging people from external signs, was revealing, and points to the continuity between Crowther’s histories of science and his previous work. Crowther constantly had recourse to psychoanalytical language in British Scientists, though by 1935 he had rejected

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82 MG, 23.4.35.
83 Sunday Times, 19.5.35.
84 New Statesman, 20.4.35, 555.
psychoanalysis as a pseudoscience. Terms such as ‘Oedipus complex’, he said in 1931, were ‘picturesque and stimulating terminology for phenomena and mechanisms equally describable in terms of the prosaic processes of excitation and inhibition.’ He was therefore seeking a behaviouristic, Pavlovian account of his scientists’ behaviour, and sought to show how they and their science had been conditioned by industrial society. This inevitably brought science and its practitioners down from the clouds, showing that they were normal human beings, influenced by their psychology and the world in which they lived. If scientists were not superhuman, then neither were other divine representatives, such as the Royal Family. (fig. 7) When considered from this perspective, *British Scientists* fitted into Crowther’s longstanding project of encouraging his readers to think more rationally about society.

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85 Crowther, *Outline*, 344.
Indeed, for other readers, *British Scientists* seemed more like Lytton Strachey than Boris Hessen. Both took an irreverent approach to established Victorian figures, speculated on the psychology of their subjects, and emphasized interpretation over fact. The resulting accounts were entertaining, even amusing. Hogben privately told Crowther that he lost a night’s sleep reading ‘the most notable thing of its kind for years and years’ and thought it would mark ‘a new stage in your career as a writer.’

Publicly, he supported Jimmy, who:

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87 SxMs29/12/9/6, Hogben to Crowther, 17.4.35; SxMs29/1/4/3, Hogben to Crowther [1935].
provided us with some first-rate entertainment. In a book which is a notable contribution to the *belles lettres* of science he has presented us with a picture of eminent scientific Victorians hardly less amusing than Lytton Strachey’s masterpiece and far more significant as a commentary on the effective social forces of the period.

The book had ‘real literary distinction’, and despite Crowther’s claim to the contrary, ‘much genuine scholarship has gone to its making.’ By affirming *British Scientist*’s scholarly nature, Hogben perhaps pre-empted criticism that the book was merely a piece of Marxist propaganda.

Anna-K. Mayer notes that deterministic histories tended to place discoveries and discoverers at the margins: Crowther’s, by contrast, devoted much space to accounts of discoveries, and reviewers who could not swallow Crowther’s Marxist speculations were grateful. In *The Spectator*, C.P. Snow compared the book to

> a conversation with someone of a provoking but interesting mind, well equipped with his scientific facts, rather uncritically acceptant of their Marxian interpretation — but when away from his textbooks full of ingenious ideas... The scientific discussions and descriptions are as lucid and reliable as one would expect from one of the best scientific journalists of the day.

Snow was evidently influenced in his comments by Crowther’s previous reputation as an interpreter. Amongst practising scientists, A.S. Russell noted that Crowther tended to stress — ‘some of us think unduly’ — the sociological aspect of scientific work in his journalism. Because it was a new perspective, ‘it may seem perverse to many of us.’ Trying to ‘explain sociologically why Davy was a snob’ was interesting, ‘but a reader gets a distinct impression that if things had been quite otherwise the explanation would have been just as pat.’ The *Times Literary Supplement* reviewer similarly gave a backhanded compliment to Crowther’s ‘ingenuity [which was] at times worthy of Macaulay’, because he took the opportunity to suggest that science was a social product ‘on every possible occasion, but he does not provide an adequately reasoned argument.’ The

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90 *Spectator*, 17.5.35.
91 *Discovery*, November 1935.
reviewer agreed with ‘the old-fashioned view that great science transcends all boundaries, whether of class or race’. Ultimately, ‘for all its stimulating suggestions, Mr. Crowther’s book must be judged as a record of the lives and works of the scientists under review’, and he had done it well. reviewers agreed with ‘the old-fashioned view that great science transcends all boundaries, whether of class or race’. Ultimately, ‘for all its stimulating suggestions, Mr. Crowther’s book must be judged as a record of the lives and works of the scientists under review’, and he had done it well.92 Russell agreed. Few biographers attempted ‘brightness or readability at the expense of fact’, as did Lytton Strachey. ‘Mr. Crowther’s book is a real contribution to biography’. If readers wearied of Crowther’s ‘“bourgeois” emphasis’ they would ‘enjoy the book… learn a lot from it… be stimulated by it. It should be widely read.’93 Other reviewers, such as J.W.N. Sullivan, while sceptical of Crowther’s interpretation, went on to recommend the book for its ‘account of the scientific work of these men’.94

If British Scientists was acceptable to supporters of the conventional approach to history of science, it was not acceptable to class-against-class warriors. Hogben privately complained to Crowther in 1936 that he was used to ‘getting kicked on both sides’, right and left, after the Labour Monthly criticized his Nature and Nurture (1933) for its ‘mildly ironic and diffuse style’ which blunted ‘the edge of his criticisms’ and because it did not view environment and genes as dialectically related.95 British Scientists had received a similar treatment. The Daily Worker reviewer read the book as attacking the myth of pure science, which was one of the “defence mechanisms” that capitalist society had developed in order to conceal the revolutionary implications of science. Though Crowther deconstructed the pure-science myth by linking ideas to practical concerns, he was no Hessen: the book contained ‘a great deal of excellent Marxist analysis’ but was ‘marred by frequent silliness at which one pulls up in amazement.’ Crowther was ‘terribly confused’ about ‘the nature and development’ of capitalism because he failed to mention imperialism, and the class struggle was not to the fore. Nonetheless scientists and workers could use it ‘with caution, in the revolutionary education of their fellow-workers’.96

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92 Times Literary Supplement, 18.4.35.
93 Discovery, November 1935.
94 Observer, 16.6.35; see also British Medical Journal, 27.7.35.
95 SxMs29/1/3/4/1, Hogben to Crowther, 28.8.36; Labour Monthly, February 1936.
96 Daily Worker, 28.8.35.
This reviewer was evidently stuck in the class-against-class era, when Comrades were expected to attack bourgeois intellectuals as representatives of social fascism. Hitler’s assumption of power in January 1933 demonstrated to Communists the futility of fighting with other left-wing parties, and CPSs across Europe therefore slowly retreated from class-against-class policies in favour of pragmatic pacts against fascism. The Comintern only unambiguously endorsed the Popular Front in the summer of 1935, however, with Dimitrov’s speech. Popular Fronts now celebrated national democratic traditions, such as Britain’s Leveller and Chartist movements, and reached out to bourgeois intellectuals.97 The Daily Worker review of Crowther’s book, coming as it did so soon after the Popular Front policy and in the CPGB’s main organ, exposed itself to being attacked for expressing an outdated dogmatism.

Ralph Fox seized the opportunity, using the review of Crowther’s book as an excuse to reflect on ‘Communism’s Fight on the Cultural Front’. For Fox, the review of British Scientists was symptomatic of British Communists’ inability (or unwillingness) to create a Popular Front as vigorous as that in France. As a loyal Communist, Fox had argued as recently as May 1934 that ‘capitalist “democracy” is also a form of dictatorship and one, moreover, which prepares the way for fascism’.98 By September 1935, though, Fox had changed his tune: now interested in how to unite cultural and manual workers, he endorsed collaboration with left-wing intellectuals and retrieval of Britain’s cultural heritage. British Scientists seemed like a good tool for the job: had not Crowther, on the very first page, quoted Davy as having anticipated ‘Marx’s conception of social development as a process motivated by the struggles of social classes for power’, thereby squaring Marxism and Englishness?99 But in Britain, in contrast to France, Communists continued to attack intellectuals for such attempts. ‘How do we receive this book’ about ‘the lives and work of British scientists in the nineteenth century’, written by ‘a well-known popular writer on science’ who

98 Communist Review, May 1934, 66, 65. Crowther had a copy of this issue: see SxMs29/2/3/5.
'tried to view these men from the standpoint of Marxism', Fox asked. The reviewer failed to say what the book was about, writing ‘a prosy column’ at the end of which he accused ‘the author… of “silliness” because he does not understand Marxist teaching on imperialism.’ That was no way to treat ‘this honest intellectual who, however weakly, has tried to give us a true picture of some of the most important Englishmen of our age, men whose lives have been neglected by the bourgeoisie as “dull.”’ The attitude of the reviewer would have to be ‘crush[ed] relentlessly if our Party is to become a leading force in cultural work.’ Rather than criticizing the likes of Crowther, Communists should recognize that ‘A writer who can influence thousands through his work, if he comes ever so little towards the working-class, even if only to understand that Fascism and war are evils, is a valuable ally.’ This was a far cry from Fox’s denunciations of intellectuals in the 1920s: now Crowther was one of them, and Fox was on the defence.

Crowther approved of the United Front policy. He joined For Intellectual Liberty (FIL), an organization formed in February 1936 that aimed to overcome the bickering of party politics and worked ‘for the defence of culture and the maintenance of peace (the first condition of intellectual liberty’). It approached well-known intellectuals, and secured the support of both artists and scientists such as Bernal (on the executive committee), Blackett, the sculptor Barbara Hepworth, Aldous Huxley (president), Julian Huxley, Hyman Levy, Joseph Needham, Charles Singer, Stephen Spender, Olaf Stapledon, R.H. Tawney, C.H. Waddington, Dorothy Wrinch and Solly Zuckerman. Seven months after its foundation, however, FIL could only boast the support of 325 individuals. Some thought the name of the organization unsuitable: for Crowther, it was too defensive: ‘it should be For the Advancement of Culture’, he told Aldous. Culture could ‘flourish in societies which do not include intellectual liberty among their first principles.’ Why allow ‘persons the intellectual liberty of not thinking’?

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100 *Daily Worker*, 11.9.35.
101 SxMs29/11/6/3, Aldous Huxley to Crowther, 10.3.36. For the history of FIL: Overy, Morbid, 300–301.
102 For Bernal’s involvement, see Brown, Bernal, 126–127.
103 Overy, Morbid, 302.
Instead, ‘intellectual parasites’ should be compelled ‘to do useful intellectual work’, and FIL should ‘protest against interference with those who are doing good work.’\textsuperscript{104} Liberty was a frivolity in times of crisis, if it was not used to present solutions to that crisis. Nevertheless, Crowther signed a FIL letter, published in October 1936 in the \textit{Guardian}, appealing for the ‘Divided Forces of Democracy’ to cooperate: ‘the forces of reaction are strong because they are united; the forces of progress are weak, in spite of their numerical superiority, because they are divided.’ The solution was for ‘the scattered forces of progress’ to ‘call a truce to the civil war that now divides them and co-operate for the defence of those democratic principles which are common to them all.’\textsuperscript{105}

Though Crowther’s remarks to Aldous Huxley may seem like a vindication of Stalinism, Crowther knew — long before Hessen’s disappearance at the end of 1936 — that the USSR also interfered with those doing useful intellectual work.\textsuperscript{106} Trials and investigations into suspected disloyal scientists were common from 1928, leading to arrests, exile or imprisonment.\textsuperscript{107} Whether or not Crowther knew of these, it was when Peter Kapitza did not return to Cambridge in April 1935 after a visit to the USSR that Crowther criticized the government in measured tones in the \textit{Guardian}. Though he agreed that ‘As a loyal Soviet citizen in a period of national crisis it seems clear that when his Government has invited him Kapitza should work in Soviet Russia’, Crowther doubted ‘whether his abilities, which were of a peculiar type, could be as fruitful in any other environment’ than Cambridge. He criticized the Soviet Government for not issuing ‘its invitation in a form that could not be misunderstood either by Kapitza or the rest of the world.’ They had ‘made a psychological mistake’ that could harm Kapitza’s research or

\begin{footnotesize}
\begin{enumerate}
\item[105] MG, 2.10.36.
\item[106] Chilvers, ‘Dilemmas’, makes much of Crowther’s contact with Hessen. The point about Crowther erasing any reference to Hessen from his books after the latter’s death in 1936 due to fear of being associated with him is, however, ultimately unconvincing (p. 434). A reference to Hessen appears in \textit{Famous American Men of Science} and in the republication of his \textit{British Scientists} in its Pelican edition (1940).
\end{enumerate}
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‘Anglo-Soviet scientific relations.’\textsuperscript{108} Stalin, of course, was meant to be infallible: this was an attack, albeit a restrained one, on the USSR in support of Crowther’s old friend.

Crowther’s criticism of Kapitza’s treatment joined the chorus, but it took ‘quite a bit of courage’, as Kapitza’s wife, Anna (still in Cambridge) acknowledged. She knew Jimmy had a ‘close connection’ with people in the USSR and ‘that by your action you could make yourself quite unpopular there, and this is a difficult decision to take.’ Since ‘No one wants or likes to be told the truth’, telling it ‘requires courage’ as ‘the result is not always a pleasant one for the man who does it.’ Anna hoped ‘our people at home would take the chance which is given them at the moment’ and let Peter return to Cambridge, but their response was unpredictable: ‘no one can say how they will react to it all.’\textsuperscript{109} In the event, Kapitza was forced to stay in Russia.\textsuperscript{110}

Michael David-Fox shows that Western reactions to the USSR were often more mixed (particularly in private), even amongst its most ardent admirers, than is assumed — and Crowther was no exception.\textsuperscript{111} Kapitza’s ordeal informed the writing of Crowther’s next book on Soviet Science, which he was working on in the middle of 1935. In the draft of the preface he frankly acknowledged that ‘Persons who do not fit in with the accomplishment’ of the USSR’s attempt to create a new civilization ‘are treated unsympathetically.’ Scientists had been ‘treated stupidly & harshly, and in some cases cruelly, by administrative superiors who were not qualified to understand their difficulties. Some scientists have suffered extreme penalties for pointing out technical truths that happened to be unpalatable.’ These were odd words for an alleged Stalinist: they conceded the existence of a higher scientific truth that was flouted in favour of the Communist line. Admittedly, Crowther shifted the responsibility from the system by blaming ‘administrative superiors’ — and the scientists themselves, who ‘exasperated the leaders of the construction by harping on details of secondary importance, and

\textsuperscript{108} MG, 25.4.35.
\textsuperscript{109} SxMs29/12/9/6, A. Kapitza to Crowther, 26.4.35.
\textsuperscript{110} See the \textit{ODNB} for Kapitza.
\textsuperscript{111} Michael David-Fox, \textit{Showcasing the Great Experiment: Cultural Diplomacy and Western Visitors to the Soviet Union, 1921–1941} (Oxford, 2012), 3, 23, passim.
failing to respond to the grandeur & correctness of the general lines of the plans of construction.’ But he also attributed the situation to the backward state of Russia in 1917 and its shortage of experts, which meant that ‘many half-trained persons were placed in responsible directive positions’, some of whom ‘have caused much suffering.’ Soviet Science showed, nevertheless, that a ‘colossal’ amount had been achieved since 1921. With that in mind,

one may devote a sympathetic thought to the many individual scientists, who, through their own fault, or that of others, have not been able to find their proper place in the scheme. May those scientists, who have the wrong point of view correct it, and the government discover the best way of encouraging those scientists they have failed to understand.\footnote{112}

All these comments were, however, removed in proof stage in January 1936, and the preface instead stated that the book aimed to give information about the sort and conditions of research in Soviet scientific institutes. It contains little discussion on the relation of political freedom to scientific research and discovery. Before this problem may be discussed profitably, it is necessary to see what can be done under the conditions of a working-class and communist dictatorship.\footnote{113}

In public, perhaps aware of the need to encourage a United Front, Crowther toed the Party line.\footnote{114} As Oren Harman has shown, even the geneticist Hermann Muller was reluctant publicly to reveal facts about the terror; negative facts had to be taken, he said, alongside favourable facts.\footnote{115} There are hints of this attitude in Crowther’s attempt to balance the ‘grandeur’ of Soviet achievements against individual suffering. But perhaps he decided that it would be better not to give ammunition to right-wing critics of Soviet Russia, particularly as Muller had informed him in the same month that the country was witnessing ‘progress and rapid improvement of the standard of living, that is acting as an encouragement and stimulus to every one. If only war can be staved off for a few years more the

\footnote{112}{See the ms and proof contained in SxMs29/12/4/6 and SxMs29/12/4/14.}
\footnote{113}{J.G. Crowther, Soviet Science (London, 1936), ix.}
\footnote{114}{Later in 1936, support for the United Front prevented others from speaking out: Paul Corthorn, ‘Labour, the Left, and the Stalinist Purges of the Late 1930s’, The Historical Journal, 48 (2005).}
\footnote{115}{Oren Solomon Harman, The Man Who Invented the Chromosome: The Life of Cyril Darlington (Cambridge, 2004), 164.}
gain will be tremendous.'\textsuperscript{116} Perhaps he feared the regime might give the wrong sort of ‘encouragement’ to scientists; or maybe he read Sidney and Beatrice Webb’s \textit{Soviet Communism: A New Civilization}— which had appeared in the meantime — and decided his book ought to match its zeal.\textsuperscript{117} In fact, contemporary reviewers did not read \textit{Soviet Science} as propaganda for the USSR. C.P. Snow, writing in \textit{The Spectator}, thought it ‘informed, fresh and stimulating’; it bore the marks of Crowther’s ‘scholarly’ and ‘fair’ journalism. It prompted more questions than it answered, and one had to conclude that

Just as in literature there has been no creative work of a high order, in the exact sciences there have been very few important discoveries... there is still a great distance before Russian physics catches up that [sic] of England, America, even Scandinavia or Holland.\textsuperscript{118}

By January 1936, Crowther had in fact diverted his attentions to America, the alternative to the USSR’s version of modernity. It was not just that the USSR had treated scientists badly. The \textit{Manchester Guardian} had returned Crowther’s articles on Russia because they could ‘only take a certain amount’ and in any case it seemed to Crowther ‘as if many of the new Soviet constructions will soon be blown up by the Germans and the Japanese.’\textsuperscript{119}

Looking West

As Crowther ascended the podium in Harvard University’s Hunt Hall to deliver his lecture on ‘Science and the American Constitution’ on 3\textsuperscript{rd} March 1937, he may have reflected on how fortunate he had been: fortunate that the new President of Harvard University (and organic chemist) James B. Conant (1893–1978), had read Crowther’s \textit{British Scientists} in October of the previous year and, on the

\textsuperscript{116} SxMs29/1/3/4/1, Muller to Crowther, 6.1.36.
\textsuperscript{117} Crowther made ‘a great effort to finish the ms’ because he wanted it published in November 1935 — amongst other reasons, because ‘the Webbs’ book comes out in the autumn.’ Warburg convinced Crowther to delay until January, but it did not appear until March. See RKP 42/18, Crowther to Warburg, 19.8.35, Warburg to Crowther, 20.8.35, Routledge to Crowther, 8.2.36.
\textsuperscript{118} \textit{Spectator}, 27.3.36.
\textsuperscript{119} SxMs29/9/2/6, Crowther to Crozier, 30.7.34 and Crozier to Crowther, 31.7.34; SxMs29/12/9/8, Crowther to Crozier, 14.3.36.
strength of it, invited Crowther to deliver a series of lectures at the university; fortunate that, ten months before Conant’s letter, Crowther had become interested in the history of American science, had decided to write a book on it, and therefore had a topic for the lectures; fortunate that he was being paid $850 to give the lectures, which compared favourably with book royalties; fortunate that he had the opportunity to see the country that had long fascinated him.120

As Hobsbawm writes, after World War 1, people looked to science, American capitalism and the Russian Revolution for progress; after America stalled in the Great Depression, science and the USSR remained.121 But as early as 1926, in Tommy Hobson, Crowther’s fictional self had said that the ‘genii of the twentieth century are the capitalist undertaker and the scientist. England and America are their home’, adding that ‘the ugly and the virile has more possibility than the beautiful and sterile.’122 As it turned out, with the New Deal America was reintroduced into Hobsbawm’s progressive triad. Just as the Soviet Union borrowed from Henry Ford in its early years, so America now seemed to be returning the favour. The New Deal vindicated Crowther’s 1932 prediction that the USSR’s importance lay in the ‘invaluable data’ it provided ‘for those who must sooner or later devise a satisfactorily organized industrial society’; he was prepared to believe that ‘Western countries could be shocked without revolution into reforming their social organization.’123 Roosevelt himself confessed that the New Deal drew on ‘some of the things that were being done in Russia and even some of the things that were being done under Hitler in Germany’, but it was a pragmatic, experimental venture rather than Communist.124 The federal government intervened to combat the depression by stabilizing banks, providing work for the unemployed, and taming industrial competition. Moreover, only a few months after Crowther’s British Scientists was published, Roosevelt signed a charter for trade unions, which were fostered as a way of redistributing wealth

120 SxMs29/2/5/I, Conant to Crowther, 16.10.36.
122 SxMs29/12/30/I, Hobson MS, 353.
123 Crowther, Industry, 85, 88.
without the intervention of the state.125 This followed an upswing of worker coordination in the wake of the 1933 National Industrial Recovery Act, which itself resulted in general strikes the following year.126 Membership of trade unions burgeoned, increasing over fivefold; by the late 1930s, the industrial and political strength of workers compared favourably with the British labour movement.127 A cultural front, composed of radical modern artists such as Jon Dos Passos, Orson Welles and émigrés from Nazi Germany, flourished.128 By 1936, with the softening of the Party line, even the Communists supported Roosevelt’s re-election.

Scientists who were sympathetic to the USSR looked to the New Deal for many of the same reasons: it was the experimental nature of Roosevelt’s politics, and the planned application of science to solve social needs, that appealed. Julian Huxley was one of the earliest to cast his eyes west. He was particularly enamoured of the Tennessee Valley Authority (TVA), and reported on it in 1935 in The Times and The Listener. In modernizing the valley, Huxley wrote that administrators had to deal with similar problems as the USSR: poor agriculture and a ‘backward’ (but not genetically inferior) population. For Huxley, the TVA served as an example of social engineering in the absence of dictatorship: it was in the process of uplifting the ‘hillbillies’, of educating them and improving their health. The planning was interconnected, and covered ‘all aspects of life.’ Overall, Huxley saw ‘the early growth of a new and hopeful type of social organism’, one that combined science and vision on a large scale. He hoped that a similar experiment could be introduced in Britain: ‘If one has got to try some sort of planning, the methods employed by the TVA are adapted to a democratic regime.’129 This ‘valuable American belief in political experimentalism’ was also attractive to Crowther, and he saw it as ‘due in part to the influence of science and of the broad teaching of science, which is such an excellent feature of

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125 Crowther’s archive contains pamphlets from the American Labor Union on the prospects for an American Labour Party, amongst other things: SxMs29/2/5/3.
128 Denning, Cultural, xiii–xvi.
129 The Times, 22.5.35, 18; The Listener, 20.11.35, 897–900.
American education.” Furthermore America, like Russia, encouraged scientific research; as European war looked increasingly likely, science — and hence progress — resided in the USA. ‘The decay’, Crowther noted, ‘of international relations in Europe has enhanced the importance of the progress of science in the United States.’ In the event of European war, culture would be ‘retarded’, but in the impregnable and self-contained USA, science could continue.

So Crowther began reading American history to attempt to understand why ‘Scientific ideas have had an exceptional influence on the history of America, more, perhaps, than on the history of any other country, except the USSR.’ He expressed approval of Thorstein Veblen’s ‘brilliant writings’. Veblen had inspired the recent technocracy movement, whose advocates argued — not unlike Crowther — that science could bring abundance and technology salve the depression. Crowther intended, as he wrote his publisher, ‘to look at [William] James from the standpoint of Veblen’s Theory of the Leisure Class. I notice that Stephen Spender has had a roughly similar idea in his essays on Henry James, the brother of William.’ In his notes, Crowther paraphrased Veblen’s argument that the ‘aberrant scions of leisure class produce science, but more from middle-class persons who have risen into leisure class’. Franklin was a perfect example — whereas the researches of the leisure class were usually non-practical, Franklin came from the lower-middle-class and inherited their industrious talents. Meanwhile, Thomas Edison was not ‘the inexplicable wizard of invention’, as traditionally portrayed; the masochistic Joseph Henry, as Secretary of the Smithsonian Institution, represented ‘a distinguished forerunner of the modern social planners, who wish to integrate science into the machinery of society’; and Josiah Gibbs remained under-appreciated because, though his science had social use, he was at Yale where most of his peers saw science as an offshoot of

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131 SxMs29/2/5/3, ‘Science in USA’ ms.
132 Crowther, Famous, 135.
133 Ibid., 22–23.
134 Segal, Technological, 120–124.
135 SxMs29/9/1/4, Crowther to Warburg, 21.5.36.
136 SxMs29/1/2/2, notes on Veblen.
137 Crowther, Famous, 22–23.
curiosity. As in *British Scientists*, Crowther did not attribute scientific developments merely to material need, noting — for example — the importance of climate to the success of Franklin’s electrical experiments.

As Crowther became interested in the USA, so American readers became interested in Crowther’s works. The American edition of *British Scientists, Men of Science*, was the principal selection of the Scientific Book Club: as Crowther’s American publisher, William Norton, said, this entailed extra sales of around 300 copies and ‘ought to be very good for this book and for your future work in America.’ Unfortunately, comparative sales figures with the British edition are not available, but by the end of December 1937, *Men of Science* had sold 1064 copies, not a terribly encouraging figure. However, those who read it were positive. The Nobel Prize winning physicist Robert Millikan told Crowther that it was ‘exceedingly valuable for everybody who is at all concerned with the development of modern civilization through the advances in science.’ Muller revelled in the book: he usually avoided biographies, he admitted to Crowther — ‘so often mere jumbles of detached facts’ — but Crowther’s ‘narratives and accompanying analyses of the lives of these keystone figures’ were ‘most absorbing and enlightening.’ Reviewers were also flattering. Clifford Furnas, Professor of Chemical Engineering at Yale, believed that even if the science were left out, ‘it would have been a book of biography which would have been comparable in interest if not in brilliancy to Strachey’s important work.’ Crowther banished the notion of scientists as mythical, and ‘after all, we would probably prefer to have our scientists as human beings like the other people whom we know, rather than as little gods.’ The historian of technology Lewis Mumford had some criticisms. Most notably, Faraday’s focus on electricity disproved Crowther’s theory because the chief problems of the early 1800s related to mechanics and metallurgy.

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138 SxMs29/12/9/7, Crowther to Norton, 3.12.36.
139 SxMs29/11/3/11, Norton to Crowther, 25.2.36.
140 SxMs29/2/5/3, Norton to Crowther, 18.1.38.
141 SxMs29/12/9/6, Millikan to Crowther, 2.6.36.
142 SxMs29/12/9/6, Muller to Crowther, 3.5.36.
143 *Saturday Review*, 14.3.36.
By refusing to respond to the limited demands of the Victorian manufacturer, Faraday enabled society to take a short cut that led beyond these activities into the new world of neotechnics. It was a victory of the cloister over the marketplace.

In *Technics and Civilization* (1934), Mumford’s three phases of history — the eotechnic, paleotechnic and neotechnic — overlapped, and Faraday was an example. But if Crowther had not quite worked out how ‘to follow through the delicate personal and social threads that bind a theory in physics to the current life of a community’, it was only because he was attempting something new: ‘if one finds his social interpretation sometimes strained, sometimes muddled and inconclusive, one must in all fairness grant to him the leniency one accords to the work of a pioneer.’ Mumford had long harboured contempt for university scholars, and he possibly saw in Crowther a fellow generalist, attempting to bridge the arts-sciences divide.

Conant, whose interest in the history of science had been nurtured by the historian of science George Sarton (1884–1956), was another appreciative reader, and so it was that Crowther found himself on the *SS Paris* in 1937, drinking the inferior coffee and imbibing the ‘democratic’ atmosphere that ‘reflected the French popular front’. He decided to wire for Franziska to join him; she ‘would be able to advise me on how the audience was reacting to my lectures’ and ‘it might be to our advantage, if Harvard was thinking of giving me a job, if they had seen us together.’ Perhaps Crowther hoped to secure one of Conant’s wide-ranging professorships, that he later described positively in the *Guardian*, which aimed ‘to achieve that synthesis of modern knowledge which the world demands’. Franziska had also ‘made a definite contribution to’ the lectures ‘in ordering & criticising... The lectures were partly hers.’ Upon landing, the ‘beautifully clean & well-ordered’ New York created ‘a lively impression’. Its ‘light & charming’ modern architecture was, however, nowhere to be seen in

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144 *The New Republic*, 3.6.36.
147 MG, 21.4.37.
148 SxMs29/2/5/1, Feb/March 1937 notebook i, 3–15.
Boston and Harvard, which were ‘rather cold & forbidding’ in comparison. But it was not so much aesthetics as politics that interested Crowther. On the first night, he dined with Norton, the geneticist L.C. Dunn and the virologist Francis Peyton Rous: all were anti-Alexis Carrel (the French eugenicist), and all supported the Spanish government. So far, so good. But the biochemist Lawrence Henderson was conservative. Nor did the socialists at a Science & Society party wholly satisfy. Most seemed intolerant, and there were ‘several pretty bitter men, perhaps party members.’ (This private comment incidentally illuminates Crowther’s political allegiances in the 1930s.) The Marxist writer Henry Hart, on the other hand, ‘was quiet, polite, & charming... He seemed an exceptionally attractive man’, and he and Crowther struck up a friendship. Hart updated Crowther on conditions in the USA in the following years, and reassured Crowther that his work was valuable: ‘Capitalist politics and economics are so irrational that I don’t see how your own work can seem minor — for long. Believe me, it is even more vital than left politics, in the long run.’ Overall, Crowther thought progressive views were in the ascendant at Harvard.

However, when Vere Gordon Childe visited Harvard in May 1937, he reported that Crowther’s lectures ‘provoked controversy among historians.’ Childe did not elaborate, but the American historical profession was entangled in debating the uses of history in the 1930s. One Harvard historian, C.H. McIlwain, disparaged the subjective, utilitarian approach in his Presidential Address to the American Historical Association in December 1936. Already, McIlwain worried, ‘there are more than hints in certain parts of the world that all past history must be rewritten for a present purpose.’ Crowther’s lecture on ‘Science

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149 Ibid., 30, 31. Crowther was captured by the ‘technological sublime’: Nolan, Transatlantic, 124.
150 SxMs29/2/5/1, Feb/March 1937 notebook II, 22, 23, 44.
151 Science & Society was a recently-established Marxist journal.
152 SxMs29/2/5/1, Feb/March 1937 notebook II, 3, 5, 30.
153 SxMs29/1/3/4/3, Hart to Crowther, 15.8.38 (my emphasis).
154 SxMs29/2/5/1, Feb/March 1937 notebook II, 31.
155 SxMs29/1/3/4/2, Childe to Crowther, 6.5.37.
and the American Constitution’ must have seemed particularly disconcerting. A month earlier, frustrated by the Supreme Court’s unwillingness to pass New Deal legislation, Roosevelt had announced his plan to change the composition of the Court. Crowther aimed to shed some historical light on the blockage. The link between the ‘checks and balances’ embedded in the constitution and Newtonian physics had already been noted by Woodrow Wilson, an author Crowther read at the beginning of 1936.¹⁵⁸ Crowther fleshed out the idea, and showed that the only scientist amongst the Founding Fathers — Franklin — opposed the Constitution. The rest were lawyers, attracted to an outdated Newtonian physics (which made the universe work by laws), and so they introduced checks and balances into the makeup of the government. These lawyers were members of Veblen’s leisure class, ‘not in direct contact with machinery’. Since those who worked with machines had ‘to study sequences of phenomena… to understand power-machinery’, the Founding Fathers preserved ‘the archaic belief in animism & religion’. ‘The respect of lawyers like J. Adams for Newton’, Crowther wrote in his notes, was ‘due to Newton’s magical law-giving to nature: not to his power of discovering new truth by experiment.’¹⁵⁹ Science — as manifested in disagreements between the executive, Congress and the Supreme Court — therefore ‘had a part in the rejection or delay, for good or ill, of social plans such as the New Deal.’¹⁶⁰ Here was another example ‘of the dangers of the misapplication of scientific ideas by politicians who do not properly understand them.’¹⁶¹ In recent years, us politicians admitted that they wanted to experiment in politics, as Franklin did in science, without knowing the answers. Crowther’s message — an endorsement of the New Deal and a censure of the backward Supreme Court — was clear.

Franklin’s willingness to experiment, like Roosevelt, was not the only reason for Crowther’s admiration. Franklin embodied the model ‘politician-philosopher-journalist’, a ‘model to which modern men must return if contemporary problems are to be solved’: for all his admiration for Veblen and science, Crowther did not

¹⁵⁸ SxMs29/12/10/11, British Library ticket, 6.1.36.
¹⁵⁹ SxMs29/12/10/1, notes on Beard’s Economic Interpretation of the Constitution of the United States, 68.
¹⁶⁰ Crowther, Famous, 135.
¹⁶¹ Ibid., 140. See also SxMs29/12/10/10, ‘Science and the American Constitution’ lecture Ts, 7a.
agree that specialists alone could solve humanity’s problems. Specialists tended to exaggerate the importance of their own subjects, and could easily be misled by quacks on other topics; the lawyer Founding Fathers were an example of this. Specialization was a ‘centripetal force... driving inward to dictatorship’. The solution, as the Harvard Crimson reported on Crowther’s lecture, ‘philosophic journalism’, required ‘breadth of understanding, fertility of mind, and coordination of walled-in ideas.’ Franklin ‘was one of the first and greatest of the philosophic journalists’. He taught people about ‘the possibilities of society and nature... He put a vast range of human knowledge within the reach of the people. Until the people have knowledge they will not know how to avoid dictators.’ Wells was an example of a modern ‘member of the same class.’ Yet informing the public about nature’s promise was only one half of the attempt to help people see that better alternatives to dictatorship existed: people also needed ‘some general idea of the system and tendencies of the forces that govern society.’ Franklin and Wells had ‘optimism and love of novelty’, but were ‘weakest in analysis of historical forces.’ Crowther’s ‘philosophic journalism’, an elaboration of scientific journalism that took the form of histories of science, tried to be strong in both. It was as if, as the world slipped closer to war, Crowther had further to broaden the scope of his writing to compensate.

Crowther’s project amounted to a merging of journalism and history of science into one single role — a role that could assist in scientific progress. This is significant because, as Anna-K. Mayer has argued, scientist-historians saw history of science as integral to science itself: a sophisticated understanding of the history of science could lead to new developments in science. In his final lecture on the significance of the history of science, Crowther argued for the closeness between journalism and history, and saw the emergence of history of science and the formation of Science Service as pointing to the same social developments.

‘Journalism is a form of written history. The events of the last moment belong to

163 The Harvard Crimson, 3.3.37.
164 Crowther, Famous, 43–44.
history just as much as the Great Pyramids of Egypt.’ Journalists were ‘in more direct contact’ with their material than historians. This allowed them to have insight into the past: ‘a scientific journalist who systematically studies the work and personalities of scientists, and tries to see their relation with their environment, may acquire an insight into the significance of the history of science in other periods.’ Practising scientists, who worked ‘intensively in one place for long periods’ were not ‘as closely in contact with the nascent spirit of discovery as the scientific journalist who has to interview a discoverer of new knowledge almost every day.’ The scientific journalist saw many different researchers, laboratories, intellectual and social environments, and so on, whereas an individual scientist may only have experience of one of each. Aspiring historians of science should therefore receive a training in scientific journalism, so they would see science as ‘a living activity, necessarily connected with the social environment and the personality of scientists’.166 In this way, Crowther justified his incursions into history as a natural development of scientific journalism.

Interestingly, more traditional historians of science, who focused on the internal development of science, supported Crowther. George Sarton ‘was very flattering’, and found this lecture interesting (although he arrived too late to hear Crowther’s ingratiating tribute).167 Back in England, Crowther sent the typescript to Charles Singer, who discussed it with Richard Gregory. Singer thought Crowther had ‘an entirely new method of approach and your treatment of the subject is most convincing.’168 Crowther took the opportunity to re-iterate his opinion that ‘the history of science must become a very big and important subject, if civilization is to advance’.169

As British Scientists was used by Fox to argue for a cultural popular front, so American Men of Science was used by Hogben to argue for an Anglo-American
Marxism. Werskey suggests that Hogben was ideologically astray in this period, but the evidence indicates that he and Crowther were — despite Crowther’s more fervent defence of the USSR — close, at least to readers.\(^{170}\) Hogben wanted *Mathematics for the Million* to be produced by Routledge, Crowther’s publisher, and they were ‘particularly anxious to publish... it fits very well into our list.’\(^{171}\) They entertained the possibility of a smaller edition, to be published later and written in cooperation with Crowther.\(^{172}\) In his next ‘Primer for the Age of Plenty’, *Science for the Citizen* (1938), Hogben specifically recommended Crowther’s two books in the preface, and Allen and Unwin hoped that Crowther would contribute a volume to the series. Hogben wrote a two-page gushing review of *American Men of Science* for *Nature*, in which he again compared Crowther to Strachey for the ‘faintly ironical flavour of the author’s style’. The book could assist scientific progress, by equipping ‘scientific workers as citizens... with understanding of agencies which decide the stability of a social culture. Only as an integral part of the story of man’s social relationships can the history of science give them this understanding.’\(^{173}\) For his part, Crowther’s *Guardian* review of *Mathematics* explained that — like Cobbett’s writings on grammar — Hogben’s book could help citizens in the assertion of liberty. Only mathematics, and not ‘ancient linguistic modes of expression’, could handle ‘the complexities of modern life.’ Since fear of complexity and mathematics prevented the solution of social difficulties, ‘the destruction of the common fear of mathematics is a social task of prime importance.’ Hogben hoped to destroy fear by showing the origins of mathematics as a concrete, experimental science, before ‘the scaffolding of discovery is thrown away’.\(^{174}\) Thus, as in Crowther’s work, demonstrating the origins of science or mathematics in agriculture, trade, artillery or navigation (for example) was a pedagogical technique to make science understandable. As Hogben wrote to Crowther: ‘I do *entre nous deux* think I have shown that Marxism can be applied as an instrument of pedagogics and why the hell Levy

\(^{170}\) Werskey, *Visible*, 165.

\(^{171}\) RKP 11/3, Routledge to Hogben, 8.7.35

\(^{172}\) RKP 11/3, undated note on ‘Mathematics for the Masses’.

\(^{173}\) *Nature*, 11.9.37, 439, 441.

\(^{174}\) MG, 9.10.36.
doesn’t do it better instead of talking generalities about science as a social venture
I don’t know!"\textsuperscript{175}

Hogben contributed an article to \textit{Science \& Society} which suggests why he valued Crowther’s histories so highly. ‘Our Social Heritage’ maintained that Anglo-American Marxists should pay attention to their past:

\begin{quote}
… no helpful contribution to the social culture of a rationally planned economy of human welfare will be made by missionary zeal for a foreign creed unfortified by sympathetic appreciation of the contribution which our Anglo-American heritage has made and can still make to the commonwealth of knowledge.
\end{quote}

Adopting dialectical jargon — rejecting ‘the social realities of language’ — was ‘neither good Marxism, good history or good salesmanship in the realm of propaganda.’ Unlike Dobb’s \textit{On Marxism Today} (1932) or Mirsky’s \textit{Intelligentsia}, Crowther’s books were ‘brilliant’. Indeed, Hogben’s examples of how the legacy of English-speaking countries could be rescued came from Crowther. The natural philosopher William Petty (1623–1687) and the social reformer Robert Owen (1771–1858) came up with the Labour Theory of Value before Marx, for example, and Franklin ‘subscribed to Petty’s view that human effort is the only rational basis for costing a scientifically organized society’.\textsuperscript{176} Crowther had mentioned to Hogben ‘the germs of the Labour Theory of Value in Franklin \& Petty’ a few months before.\textsuperscript{177} In short, in order to ‘play a fruitful part in a popular intellectual front’, advocates of Marxism had to ‘emphasize its historical role as custodian of the positive cultural achievements of the English and American Revolutions’.\textsuperscript{178}

Helpfully, \textit{American Men of Science} was published by Secker and Warburg, which was as anti-Communist as it was anti-Fascist; Hogben therefore used it as a tool with which to bash the ‘College of Communist Cardinals’ at the Left Book Club. Launched early in 1936 by Victor Gollancz, a Communist sympathizer, in

\begin{footnotesize}
\textsuperscript{175} SxMs29/1/3/4/1, Hogben to Crowther, 28.8.36.
\textsuperscript{177} SxMs29/1/3/4/1, Hogben to Crowther, 24.9.36.
\textsuperscript{178} Hogben, ‘Our Social Heritage’, 151.
\end{footnotesize}
an attempt to bring the progressive left together against fascism, by December 1936 the club had 35,000 subscribers.\footnote{179} In 1938, Hogben attacked Gollancz in \textit{Plebs} for monopolizing the socialist book-market, and encouraged readers to buy Crowther’s books. ‘Crowther justly won for himself a position of distinction as a writer, an interpreter and an historian of science’ with the publication of \textit{British Scientists}, Hogben wrote. Both Crowther’s histories ‘would deserve to be read widely for their literary merits alone. What makes them specially noteworthy is that they embody the view of adult education for which the \textit{Plebs} stands.’ Given the books’ merits, Hogben wanted their author to survive:

\begin{quote}
I say advisedly, and with full responsibility for my words, that Crowther’s books on the history of science mark a new phase in the history of scientific popularisation, and I prophesy that they will live. What I cannot prophesy with equal conviction is that Crowther will also continue to live.
\end{quote}

Hogben understood that most working-class students could not afford fifteen shillings for a single book, but they could purchase it by instalment, and

\begin{quote}
the worker who pays seven and six or fifteen bob for a book which gives him the guts of a whole library is making a far better investment than he would do if he bought fifteen sixpenny or shilling books cheaply produced.
\end{quote}

Hogben’s argument was based on the intellectual and material longevity of more expensive books. But he also objected politically to Gollancz’s cheaper productions. ‘It has always been difficult for a left-wing author to live’; it was now even harder without ‘an \textit{imprimatur} from the College of Cardinals over which Mr. Victor Gollancz presides in papal magnificence’.\footnote{180} Gollancz defended his venture in the next volume: he had in fact commissioned a book from Crowther which would appear in the Left Book Club.\footnote{181} On this occasion, Hogben’s attack on inflexible Communists backfired.

When Hogben visited America a few years later, he recalled seeing ‘the New Deal through rose-coloured spectacles.’\footnote{182} He was not the only Marxist scientist

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\end{flushright}
to visit the US after Crowther’s reconnaissance, and when the American social relations of science movement was emerging.\textsuperscript{183} Blackett visited and, thanks to Crowther’s intervention, delivered a lecture on the history of science at Harvard.\textsuperscript{184} In a sense, we can see these visits in the context of broader trends: thanks to the Great Terror, travel to the USSR decreased dramatically from 1937.\textsuperscript{185} But Conant’s invitation to Crowther came before the Great Terror, and Crowther’s interest in the USA before Conant’s letter. Crowther regarded the New Deal as a hopeful experiment in politics, and saw political experimentation as inherent in their society, based as it was on an appreciation of science. Unearthing and reinterpreting their scientific past could place the New Deal within the US political tradition. Certainly, Crowther also placed his vocational hopes in the country, particularly as many of his friends and Nazi refugees — such as Gropius and Moholy-Nagy — were making their way across the Atlantic, but this should not blind us to the appeal of Roosevelt’s USA as an alternative form of planning. Crowther’s world seemed to be shifting west.

Conclusion

Crowther’s lectures at Harvard were the high point of his career as an interpreter of science, and indicated how far he had come since dropping out of Cambridge. Brayshaw, Crowther’s childhood friend, was astonished ‘To know I had a friend who was to lecture at Harvard! Wow.’\textsuperscript{186} As I have argued, Crowther’s interest in the USA preceded both his visit to the country and Hessen’s disappearance in the purges. It followed a growing disillusion with the USSR in the months before January 1936, related to Kapitza’s detention and rising Soviet-Japanese tensions (which had the potential to destroy the USSR’s constructions). I have also shown that the Communist class-against-class policy held little attraction for Crowther — contrary to usual portrayals of his politics — which may have influenced his

\textsuperscript{183} Peter J. Kuznick, \textit{Beyond the Laboratory: Scientists as Political Activists in 1930s America} (Chicago, 1987).
\textsuperscript{184} SxMs29/1/5/2, Crowther to Conant [undated] and Blackett to Crowther [undated].
\textsuperscript{185} David-Fox, \textit{Showcasing}, 303.
\textsuperscript{186} SxMs29/2/5/1, Brayshaw to Crowther, undated.
attitude to the USSR. Meanwhile, exciting social and scientific experiments were happening in the US. Crowther regarded the quality of scientific research in America as having risen swiftly in the twentieth century, as indicated by the number of Nobel prizes awarded in that period. Roosevelt’s New Deal seemed to be achieving a workable balance between freedom and planning but, above all, Roosevelt seemed willing to experiment in politics. Ultimately, Crowther ended up somewhere between the USSR and the US; once again, he was caught in the middle.

More broadly, Crowther’s histories of science were regarded as a contribution to the cultural popular front. Ralph Fox defended British Scientists against critics in the Daily Worker, and used the book as a tool to reinforce the CPGB’s new line of not attacking cultural workers. Hogben, though not a Communist, also saw Crowther’s histories of science as examples of how to create an Anglo-American Marxism. It was crucial, he thought, not to reject the cultural heritage of English-speaking countries: though drawing on Hessen’s ideas, Hogben and Crowther also thought it important to show that Marxism had Anglo-American roots. This places them firmly within the attempt to show that ‘communism (with a small c) is English’, an attempt usually associated with poets and novelists. But the continuities with the Plebs perspective as discussed in chapter 1 are also conspicuous, especially the insistence on a jargon-free style and opposition to dogma.

Indeed, the continuities with Crowther’s previous interpretations were clear, and they force us to revise our understanding, largely formed by the Cold War ‘winners’ in the history of science discipline, of so-called determinist histories. Crowther explicitly pitched history of science and scientific journalism as complementary, presenting their union as ‘philosophic journalism’ and as the necessary antidote to such diverse evils as overspecialization, fascism and the blocking of New Deal legislation. While Crowther’s enthusiasm for the USA represented a new direction, his writing demonstrated that there was considerable continuity with his earlier views. As we have seen, even readers who objected to Crowther’s Marxism enjoyed the accurate (and lengthy) expositions of scientific theories and experiments, something that ‘determinist’ histories are assumed to
have lacked. Mary Jo Nye suggests that left-wing interpreters failed to reshape the history of science in part due to Marxist jargon and ideals, but Crowther’s work received complimentary comments from more traditional historians like Singer and Sarton.\textsuperscript{187} Lack of institutional support for new approaches is a more concrete explanation, and we can only speculate on how the history of science — or ‘philosophic journalism’ — might have developed had Harvard offered Crowther one of Conant’s wide-ranging, synthetic professorships, as Crowther had clearly hoped.

For around fifteen years, Crowther had built up a career and gained a reputation as an interpreter of science, so when he became Director of the British Council’s newly created Science Department in 1941, it perhaps seemed a vindication of his work so far. However, rather than easing Crowther’s concerns about his position within science and society, his time at the British Council brought them into sharper relief.\textsuperscript{188} With the coming of war, Crowther had put his personal philosophy down on paper; the ensuing controversy coloured debates about the future and function of the British Council, and therefore of interpreters like Crowther. World War II strained Crowther’s position at the edges of the scientific community.

\textsuperscript{187} Nye, \textit{Polanyi}, 221–222.
\textsuperscript{188} For a similar point applied to a different context: Endersby, \textit{Imperial}, 275.
V

That Changing World

In 1940, with Britain failing to halt the dark cloud of Nazism, commentators critiqued the war effort, and contemplated thoroughgoing reform as crucial to the country’s survival. Historians have debated the extent to which Britain was radicalized between 1940 and 1941, arguing over whether the rhetoric was temporary hot air, but there can be no doubt about the existence of the effusion.¹ The press and publishers were the main outlets for political debate, with the progressive authors of Pelican Books selling in big numbers, and reaching a wider audience than the Left Book Club.² Left-wing scientists had their part to play in the criticism, arguing — despite Britain’s considerable war machine — that the government needed to make better use of science and scientists in the waging of war.³ Members of the Tots and Quots — Crowther, C.D. Darlington, Julian Huxley, C.H. Waddington, Solly Zuckerman, the journalist Tom Driberg and Tom Harrisson, co-founder of Mass-Observation — organized a ‘proper propaganda for science’. Harrisson’s investigations concerning the public perception of science provided urgency to the group’s actions, which found an outlet chiefly through Pelican Books. They criticized, but they also attempted to reform by undermining vested interests, and by creating a scientifically informed citizenry who would insist upon radical social change. Their attempts deserve to be included in any assessment of wartime radicalization, and Crowther was a key figure behind all of their activity, particularly of Pelican books’s science output.

As Geoffrey Field notes, though often vague, reform proposals tended to advocate equality, democracy, nationalization and central planning. Planning was a key issue at a time when the government was struggling to deal with rationing, evacuation, the direction of labour, censorship, and — particularly in 1942 — production inefficiencies. This broader wartime debate over planning was reflected within science. Most historians focus on Bernal and Polanyi, attributing to *Social Function of Science* (1939) a central, defining role. However, it was not until 1941 that Polanyi and the biologist John Baker founded the Society for Freedom in Science (sfs), in opposition to the notion that scientific research should be planned to meet human needs. In the same year, Crowther’s *Social Relations of Science* (*srs*) appeared, and it caused consternation amongst members of the sfs. Crowther’s main antagonist, the economist Friedrich Hayek, wrote his response to the book into *The Road to Serfdom* (1944), a hugely influential anti-totalitarian text that did not mention Bernal, and became central to the articulation of the neoliberal state forty years later.

*Social Relations of Science* played into wider debates about the desirability of planning, but it also affected Crowther’s wartime role. In April 1941 Crowther was appointed to the Science Department of the British Council, partly as a result of the Tots and Quots propaganda, and partly as a response to claims that government should use scientific journalists for propaganda purposes to win the war. There, he was tasked with propagandizing British science, which he did enthusiastically because — as we shall see — the war forced Crowther to re-think his opinion of British science, and he participated in the upswing of patriotic fervour. The President of the Royal Society, Henry Dale, sought to limit Crowther’s influence. I present this struggle in the context of Crowther’s *srs.*

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Opponents of planning (like Dale) wished to defend the scientific freedoms that (they thought) had been established in the seventeenth century. As an outsider wielding considerable influence over the public perception of science, and moreover one who advocated a broadening and extension of the scientific method to embrace social, political, cultural and public relations, Crowther challenged these freedoms. Government control of scientific activities, as represented by the British Council, went not with truth for Crowther’s critics, but with propaganda. This debate therefore cut to the heart of what it meant to be an interpreter of science. Crowther sought to redraw the boundaries of science, which were constantly being renegotiated, by seeking to embody his ideals in an institution: as we shall see, he failed.

A Proper Propaganda for Science

Politically and personally, the start of the war was hard for Crowther. The Molotov-Ribbentrop Pact, signed in August 1939, meant that when the war started in September, Crowther’s beloved Soviet Union was on the wrong side. A month after Britain and France declared war on Germany, Crowther reported to the American physicist Karl Darrow that ‘remarkably little has happened in London. There have been no bombs, & we wonder what is to happen, with the air thick in diplomatic proposals.’ There was, nevertheless, ‘a distinct war-atmosphere inside, as well as out’ thanks to the ‘powerful black-out, and reduced illuminations indoors, for sake of economy.’ Indeed, life during the Phoney War was quiet, he told Brayshaw, ‘but even less well-paid than usual!’ In September, the Guardian stopped paying Crowther his retainer; ‘Owing to the shrinking of the newspapers & other reasons,’ he wrote to a friend, ‘I have lost half my income, and I need every penny I can get.’ He and Franziska moved into a smaller flat, ‘the nearest thing to a New York apartment that we can find in these

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8 A point made by Nye, Polanyi, 190.
9 SxMs29/1/3/4/4, Crowther to Darrow, 3.10.39.
10 SxMs29/11/3/5, Crowther to Brayshaw, 29.3.40.
11 SxMs29/9/2/7 (for retainer); SxMs29/11/3/5, Crowther to Hart, 29.3.40.
Crowther’s office was later described as ‘a dark, almost Dickensian sub-basement room in Bloomsbury, littered with all manner of papers, folders, boxes, files, and a battered old typewriter.’ Overall, these were straitened times. But the people’s war rhetoric provided Crowther with a renewed opportunity to promote his aims.

From the beginning of the war, there were calls for the government to employ the service of scientific journalists. At the beginning of October 1939, Nature urged the Ministry of Information (MoI) to include a scientific department, which would distribute scientific facts, criticism and advice. Though this may seem strange to ‘senior administrators of the old type, trained perhaps thirty years ago in a school of ancient philosophy’, it would make sense to ‘their younger colleagues’ and ‘the large number of skilled working people who are perhaps the most important class in our community.’ Many skilled workers held science in ‘high repute’ and therefore ‘information and advice given in technical and scientific form (provided that [it] is not too dull) carries special conviction.’ The war effort needed ‘their technical skill and resource: it will receive them the more freely if, within the limits of necessary secrecy, they can be told how and why.’ This was therefore about convincing the workers to help in the war effort, and creating a scientifically informed citizenry, fully equipped to wage modern war. Crowther agreed. A fortnight later, Professor Allan Ferguson, physicist and a general secretary of the BAAS who was involved in establishing its social and international relations of science division, asked whether Britain was ‘making the best use of the resources which science has placed in the hands of the community?’ Predictably enough, the answer was no — he, like most other srs advocates, ignored, or was unaware of, the extent of Britain’s war machine. Ferguson ended by pointing to ‘a remarkable and deplorable fact that scientific journalism is so ill-represented on the Ministry of Information.’ At home, the

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12 SxMs29/11/3/5, Crowther to Brayshaw, 29.3.40.  
13 N.N. Greenwood, Recollections of a Scientist (Dartford, 2012), ii, 189.  
15 He quoted from the Nature article in J.G. Crowther, The Social Relations of Science (New York, 1941), 636.  
16 MG, 29.10.39.  
17 Edgerton, Britain’s.
public needed to know about health and nutrition, epidemics, rationing, the
demographic effects of new industries and the impact of new discoveries on the
war. ‘Of the value of scientific propaganda there can be no doubt.’ But ‘What is
the present proportion of scientific journalists on the staff of the Ministry?’
This call for scientific journalism to be taken more seriously coincided with widespread
criticism of the MoI. In mid-October, for example, the Institute of Journalists
passed a resolution calling for the Ministry to employ more journalists. On the
19th, Crozier told Crowther that the government were panicking about the
Ministry, and asked him to send ‘a letter to the Editor of not more than five
hundred words’ arguing why the government should pay more attention to
science: ‘you should go slow on the M.I. side of it. The suggestion, of course,
cannot do any harm, but my feeling is that at the moment it hasn’t much chance
of being seriously considered in that relationship.’

Crowther’s letter began by rehashing familiar material about the scientific
nature of modern war, before going on to argue for the importance of scientific
propaganda. It was not just about convincing skilled workers to help the war
effort: technicians could not ‘do their best unless they feel the people are behind
them’. Scientific journalists therefore had to arouse ‘public understanding and
sympathy’ for science. This, in turn, would raise ‘public efficiency and technical
moral.’ [sic] In short, ‘Science cannot any longer be used to the best advantage
without the co-operation of the whole of the public.’ Western civilization now
depended on the creation of a scientifically informed citizenry, and the
government ought to ‘establish a bureau for the propaganda of science.’
Independent, and responsible to the Lord President of the Council, the bureau
would be marked by ‘generality of view and absence of specialist bias.’ The Board
of Education might take on the work, and thus substitute formal instruction that
had been disrupted by evacuation with ‘popular science films and lecturing’.
Abiding by Crozier’s advice, Crowther only mentioned that the MoI ‘might well

18 MG, 29.10.39.
19 Ian McLaine, Ministry of Morale: Home Front Morale and the Ministry of Information in
20 MG, 16.10.39.
21 SxMs29/9/2/7, Crozier to Crowther, 19.10.39.
include the propaganda of science among its activities.’ The bureau would ‘explain how the future of science will depend on the result of the present war.’ Under authoritarianism science would wither; in free, democratic countries science flourished. Science was ‘democratic’ and ‘free’ because ‘all men are equal before the facts of nature’ and ‘it cannot discover new facts without complete liberty of questioning.’ Progress depended ‘on freedom, democracy, and science, and if we have a just cause we must be fighting for these.’

Science, which ensured progress, went together with the fundamental democratic values that Britain was defending.

Crowther’s expertise in scientific journalism, his ‘generality of view and absence of specialist bias’, would not be used by the government until 1941; in the meantime, the Tots and Quots, revived in November 1939 upon Zuckerman’s return to the UK, enacted a scheme for a ‘proper propaganda for science’. In June 1940, Kenneth Clark from the MoI and Allen Lane of Penguin Books attended a dinner of the Tots, with the latter offering to publish a book based on the group’s discussions. *Science in War* appeared shortly after, with anonymous contributions from members of the group. It sold well, but according to the group ‘only scratched the surface, a wider tackling is needed.’ Crowther had written the section of *Science in War* on ‘Persuasion and Efficiency’, which had been quoted in the *Guardian* and attracted the attention of the MoI. He collaborated with Tom Harrisson, of Mass Observation, on a ‘Memorandum on Propaganda for Science’ at the beginning of September. Harrisson was, as he said to Crowther, ‘most anxious to do anything I can in this matter as I personally feel that it is of the greatest importance.’ Mass Observation had surveyed a working class London borough, ‘which showed a considerable section hostile to the very

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22 MG, 20.11.39.
24 Mass Observation Archive, University of Sussex Special Collections (henceforth SxMOA), SxMOA/1/2/341/E/5, Oxford Tots and Quots meeting, 28.9.40.
25 SxMs29/1/4/3, Zuckerman to Crowther, 22.8.40; SxMs29/9/2/10, Crowther to Crozier, 5.9.40.
27 SxMs29/1/4/3, Harrisson to Crowther, 5.9.40.
idea of what they thought science was — particularly because many blame the
dislocation of the modern world on to the scientist.28 Up until now, Crowther
had more-or-less assumed that the masses were ignorant of science; Harrisson
confirmed it. Crowther drafted his own addition to Harrisson’s memo on science
and the press, noting that the chief obstacle in the way of better science news was
economic.29 Crowther approached Crozier to ask whether the Guardian would
‘start a campaign for the better use of science… The Ministry of Information
ought to have taken this up with the greatest energy, but nothing has been done.’
There was not enough space, according to Crozier, especially in light of the paper
shortage. Crowther responded that ‘vested interests’ were the main ‘cause of the
failure to make the best use of science’. The public may ‘insist on these being
overruled’ if they ‘got to know better what is possible’ and realized that ‘the price
of leaving them alone is to be the destruction of British civilization’.30

The outcome of this activity was the genesis of a group ‘to enquire into the
possibility of forming what amounts to a science news service’ headed by
Harrisson and including Crowther, Darlington and Waddington.31 Crowther’s
comment about the people potentially overruling vested interests indicates why
these individuals devoted so much effort to propaganda, whilst the Blitz was in
full swing. As Harrisson’s memorandum said, explaining the achievements of
science during war ‘threatens the established lines of class culture and the most
powerful vested interests’.32 It is significant, therefore, that their embryonic news
service found a potential outlet in Tom Hopkinson’s Picture Post and Lord
Beaverbrook’s Sunday Express. In The Lion and the Unicorn (1941), written in
the latter half of 1940, Orwell identified the appearance of Picture Post, which
had perhaps five million readers, as one sign that the general public sought radical
change: ‘The initiative will have to come from below’.33 The subcommittee

29 SxMs29/1/3/5/1, ‘Science and the Press: Addition to Harrison’s Memo’.
30 SxMs29/9/2/10, Crowther to Crozier, 5.9.40, Crozier to Crowther, 11.9.40 and Crowther to
Crozier, 15.9.40.
31 SxMOA/1/2/34/1/D/1, Zuckerman to Huxley, 9.10.40.
33 Field, Blood, 305 (Picture Post readership); Colls, Orwell, 149, 153; George Orwell, George
attempted to provide the knowledge necessary to effect this change: Crowther advised, in ‘hints for civilians’ (which was not published) that ‘the first, second, and last hint is: BE SCIENTIFIC!’ Air raid shelters, he said, should be comfortable, have a radio, and community singing should take place. ‘BE COOL, NOT WITH RESIGNATION, but as the best preliminary for the solution of all problems that may arise.’

A series of six long articles for Picture Post was planned:

1. How to Defend Your Village (Wintringham, Liddel-Hart)
2. Feeding Yourself (Sinclair)
3. Growing your own Food (Darlington to suggest someone)
4. Healing your Wounds (Zuckerman)
5. Encouraging Yourself (Harrisson)
6. What to Ask For (Crowther)

This was about arming citizens with the knowledge to fight a people’s war, at a time when the invasion of Britain seemed possible. Crowther considered the Picture Post articles a top priority, and he was also ‘prepared to write on The Effects of Blast on Men & Things; Real Engineering A.R.P.; Raising the Public Consciousness of Science; etc.’

In the event, the Sunday Express ran two columns of ‘Reports from the Laboratory’, which intended to show that science ‘is about us and for us.’ The scheme soon fizzled out.

Another, more successful, outlet was Pelican Books. These were intended to perform a similar function to Picture Post. In publishing the cheap sixpennies, Lane hoped, as he said in Left Review, to provide access to the ‘knowledge on which a reasonable life must be based.’ Most of Crowther’s own books were republished under the imprint, thereby bringing them to a much wider audience.

An Outline of the Universe appeared in two volumes in February 1938, British Scientists in two volumes in December 1940 and November 1941, Soviet Science in March 1943, and two volumes of American Men of Science followed in July and September 1944. Crowther mooted the American volumes as early as December 1940, as they could encourage greater sympathy between Britain and

34 SxM29/1/6/5, ‘Hints for Civilians’, 31.7.40.
35 SxM29/1/8/8, Note on Picture Post articles.
36 SxM0A1/2/34/1/D/1, Crowther to Harrisson, 6.10.40.
37 Sunday Express, 10.11.40, 29.12.40.
38 Hinton, Mass, 256.
39 Left Review, May 1938, 968.
the USA: ‘The increasing Anglo-American cooperation certainly ought to make English people take more interest in great Americans.’ Lane’s editorial committee justifiably joked that Penguin would have to start a “Crowther Corner”.40 Sales figures provide an indication, though little more, of the reach of these books. Between 6th December 1940, when it appeared, and the end of the same month, volume one of British Scientists sold 20,717 copies, a large number. Sales also showed some persistence: volume two of An Outline still sold 2,657 copies between July and December 1940, over two years after it was published.41 Such figures would have made Crowther’s books bestsellers when originally published.

Crowther now received more correspondence from readers, including workers. G.B. Pears from Lincoln acquired a copy of Crowther’s Outline, and was ‘much impressed with the idea’ in the preface, ‘an idea which is true & important, & I have not seen it propounded before by anyone — certainly by no one in your definite and incisive way.’ The book, Pears realized, was ‘obviously for the General Reader’, by which he meant ‘the sort of man who, like myself, has only had a smattering of scientific instruction at school,’ but had ‘done some desultory reading of Popular Science publications & who is interested to better himself in knowledge. For such your book is a treasure.’42 Clarence Brown from South Shields expressed

deep appreciation of the debt we working men students owe to you in allowing your “An Outline of the Universe” to be published in “Pelican Books” at a price we can all afford, and which has given pleasure to so many of us.43

H. Fiddian from Port Talbot, on the other hand, was concerned with bigger issues, and was possessed by an idea — that the mind might be a machine. ‘I adore mechanisms & see no reason from what I read to believe other than the brain is wholly material in every way.’ Fiddian wondered ‘what you pukka

40 SxMs29/9/1/5, Crowther to Lane, 26.12.40 and Lane to Crowther, 20.11.41. In September, the USA agreed to lend Britain fifty destroyers, thus beginning Anglo-American wartime cooperation.
41 SxMs29/9/1/5, royalty slips dated 17.3.41.
42 SxMs29/12/12/2, Pears to Crowther, 8.11.41.
43 SxMs29/12/11/3, Brown to Crowther, 3.1.42.
scientists think’.\textsuperscript{44} Crowther was evidently an expert to these readers, but they were not deferential, with many pointing out misprints and errors in the text. One reader was so incensed by the errors he found in \textit{An Outline} that he informed Penguin that he would consign the book to the fire. ‘If you want me to go through the two volumes and give you a complete list of errors it will cost you plenty.’\textsuperscript{45} But most probably would have agreed with the sentiment of Elizabeth Williamson, an employee at the Ministry of Economic Warfare: ‘That one can be so instructed & entertained for 6d. makes one praise God for Pelicans & their discerning editors.’\textsuperscript{46}

Crowther also exerted an influence on Pelican science output by acting as a reader for Lane. Crowther’s connection with Penguin books has been mentioned before, but the specific reasons for their collaboration has not been noted.\textsuperscript{47} To Lane, Crowther seemed ‘to have exactly the right basis of approach that our sort of publishing requires’.\textsuperscript{48} Crowther knew, as his reports show, the characteristics necessary for books to fit in Pelican’s list. One book, for example, ‘would have to be rewritten in a much simpler style to be suitable for a Penguin’, which ‘must be simple, & technical terms must be avoided.’\textsuperscript{49} Books also had to be up-to-date, though it seems that Crowther used outdatedness as an excuse for rejecting books for political reasons. He dismissed \textit{Allergic Man} as ‘charlatanism. Very little recent research is mentioned.’ (How much ‘recent’ research could \textit{An Outline} mention, having first been published in 1931?) It resembled ‘a translation of one of those quasi-scientific books which represent the shady side of Central European science.’\textsuperscript{50} He was similarly acerbic in his judgment of A.F. Barker’s \textit{The Bankruptcy of this Scientific Age}, which was ‘rubbish.’ Barker ‘was a tolerably good teacher of the science of textiles, but is quite unqualified to write a book like

\begin{footnotes}
\item[44] SxMs29/12/4/12, Fiddian to Crowther, 10.2.[n.y.]
\item[45] SxMs29/1/6/3, Norman Ogilvie to Penguin Books, 25.3.38.
\item[46] SxMs29/1/3/5/2, Elizabeth Williamson (Ministry of Economic Warfare) to Crowther, 22.2.41.
\item[47] Sophie Forgan, ‘Splashing About in Popularisation: Penguins, Pelicans and the Common Reader in Mid-20th Century Britain’ (unpublished draft, 2006).
\item[48] SxMs29/9/1/5, Lane to Crowther, 19.2.41.
\item[49] SxMs29/9/1/5, undated report on W.D. Wright.
\item[50] SxMs29/9/1/5, Crowther to Lane, 21.11.41.
\end{footnotes}
this.” Thanks in part to Crowther, then, Pelican rejected titles that could be used in support of reactionary politics.\(^52\)

In the feverish atmosphere of the summer of 1940, a rational, scientific outlook on behalf of citizens seemed a pressing need if Britain were to withstand Germany’s bombs. The ‘people’s war’ rhetoric provided a renewed justification for Crowther’s project, as instilling a scientific attitude amongst the public could reinforce the demand for radical change detected by Orwell and others. But the campaign for a ‘proper propaganda’ for science ultimately had a limited impact, as it lacked institutional support.

Outsider on the Inside

However, the attempt to create a propaganda for science served as the immediate context for Crowther’s appointment to the British Council. At the beginning of April 1941, B. Ifor Evans (1899–1982), Professor of English at Queen Mary College, London, approached Crowther about the Secretaryship of the newly formed Science Committee of the British Council, which Evans oversaw as educational director.\(^53\) The British Council had been founded in 1934, partly as a response to the rise of fascism, with the aim of promoting British aims, values and achievements abroad to an elite audience — particularly in Europe, the Middle East and South America.\(^54\) The Science Committee would advise on publicizing British scientific achievements, and Crowther would act on the Committee’s recommendations as head of the Science Department. As Evans wrote, the work would partly ‘be an extension of some of the work which, I understand, you have already carried out yourself.’ Crowther’s name had ‘been one of those warmly recommended to us’, probably by William Bragg or Blackett (respectively

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\(^{51}\) SxMs29/9/1/5, Crowther to Eunice Frost, 16.I.42.


\(^{53}\) See Evans’s ODNB entry.

Chairman and member of the Committee). He interviewed Ifor Evans and found, as he wrote to Julian Huxley, ‘that they had no very clear idea of exactly what they wanted done, or quite how to set about doing it.’ Waddington drew up a memorandum, ‘with the idea that the USA would be rather outside the field; I had the impression that that was the official line and that one has to be very careful about any proposals in that direction.’ Waddington wanted a part-time job so that he could continue to research and be ‘in the swim of science’. A ‘girl who has recently taken a science degree’ could do ‘the donkey work’, which would free the director to edit a journal, which could be ‘a very powerful influence, in England as well as abroad.’ This task required ‘the services of a really good man’, who ‘could make official contact with anyone in any branch of science’; expert coverage was not an issue, as ‘no one man can cover the whole field in the sense of being personally expert at it all’ and ‘more would be gained by having a unity of direction’.

Upon receiving this, Huxley asked Crowther to let him know whether he wanted the job, and a few days later forwarded a copy of Waddington’s letter and memo. In the meantime, Waddington definitely decided that he did not want a full time job, and ‘strongly advised Ifor Evans’ to take Crowther.

He had found his ‘really good man’ who could provide unity of direction. Blackett, Hogben, and Huxley also thought Crowther the right person for the job, and pushed for his appointment. In May, the Chairman of the British Council, A.J.S. White, offered Crowther the job on a temporary, six month appointment; Crowther would be able to continue his work for OUP and the Guardian, ‘on the understanding that your contributions would not contain anything of a controversial nature’, but would not be allowed to publish

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55 SxMs29/5/2/5, Evans to Crowther, 2.4.41.
56 SxMs29/5/2/5, Waddington to Crowther, 3.6.41.
58 SxMs29/5/2/5, Waddington to Huxley, 21.4.41.
59 SxMs29/5/2/5, Waddington to Huxley, 21.4.41 and 26.4.41.
60 SxMs29/5/2/5, Waddington to Crowther, 3.6.41.
61 ‘I am overjoyed about the British Council business over which both Stanley Unwin [chairman of the Council’s Books and Periodicals Committee] + I did some intense correspondence.’ SxMs29/1/3/5/2, Hogben to Crowther, 4.6.41.
'scientific works or any other work which was published in volume form or as articles.' Crowther agreed, but wanted £750 per annum rather than £700, and could not guarantee that his Guardian articles ‘would be entirely above any difference of opinion… At the same time, it is impossible to be a Scientific Correspondent for fifteen years without proved discretion. The thousand articles and contributions I have made in that period have raised extremely little controversy.’ Crowther joined the British Council in June. Huxley was ‘so glad’ to hear. Crowther was now an outsider on the inside.

Allan Jones has shown how Crowther’s BBC broadcasts increased during his British Council years, tying Crowther, BBC and British Council to a resurgence of internationalism around 1942. But broadcasts were not the priority. Crowther and Blackett put their belief in planning into practice at the British Council, devising a long-term and short-term strategy. The long-term aim was to ‘gradually produce a complete panorama of British science, contemporary and past. This should be described in pamphlets, current news service, and films. The initiation of parts of this plan would constitute the short-time [sic] policy’. The committee would focus ‘on a few things which will make a definite impression.’ At this point, Crowther was enthusiastic about a Davy-Faraday film, which appealed ‘very strongly’ to Blackett. This idea was developed by Franziska, the aspiring film-maker, whose voice rises into the historical record in her notes on British contributions to science, which served as advice for Jimmy. Under the heading ‘historical suggestions’, she wrote of possible pamphlets about institutions and people, and of short documentaries and feature films, the latter ‘on Davy, Faraday, with actual shots of the Royal Institution, making use of it as an historical document, as it may be destroyed by bombs’. Articles could have an ‘emphasis on the human aspect for the general press (particularly suitable for South America): for example, a short serial story, on the lives of “Madame Curie”, on Faraday’.

Franziska also made general, practical recommendations, such as to

62 SxMs29/5/2/5, White to Crowther, 23.5.41.
63 SxMs29/5/2/5, Crowther to White, 25.5.41.
64 SxMs29/5/2/5, White to Crowther, 27.5.41.
65 SxMs29/5/2/5, Huxley to Crowther, 3.6.41.
66 Jones, ‘Crowther’s’.
Hand the documentary over to the Film Department. So, you “pass the buck” & let them get the money & you just provide them with the ideas (in the case of films), and the ready material (articles & pamphlets) and reserve for yourself the final O.K.67

Pamphlets, articles and films therefore took precedence in the Committee’s provision of a wide-angled view of British science, past and present. But the main priority was to create a science news service.68 Bragg agreed, envisaging a newsletter consisting of short summaries of 40 or 50 of the less technical research papers, on the lines of the Notes in “Nature”, but more popular.69

*Monthly Science News (MSN)* duly appeared in August 1941, only two months after Crowther joined the Council, and it went some way towards fulfilling the Tots and Quots propaganda agenda. (Fig. 8) The paragraphs were largely written by practising scientists, though they appeared anonymously, and Crowther’s wide acquaintance with British scientists allowed him to secure a regular supply of material. However, the generous spacing between text and columns suggests that Crowther was not overburdened with copy, and Needham helped secure contributions by posting a notice in the Cambridge Biochemistry Department — similar notices must have appeared in laboratories throughout Britain.70 The paragraphs, as Crowther explained to potential contributors, ‘should be about 300 words long, and it is a great advantage if they can be well illustrated. A fee of 10/6d is paid for each paragraph, and the same for each illustration.’71 *MSN* was distributed abroad, at first as a supplement to the British Council’s general periodical, *Britain To-day*. It was therefore sandwiched within wider British culture, and compared to *Britain To-day*, *MSN* was less austere — it contained photographs — which must have helped to convey a sense of excitement about the possibilities of science. As the editorial in the first number declared, science ‘makes a picture of infinite subtlety and fascination. It is a prodigious achievement of the human mind.’ But it also had a practical significance, bringing ‘profound transformations of the ways in which men can obtain the necessaries of

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67 SxMs29/12/41/24, ‘British Contributions to Science’.
68 SxMs29/5/2/10, ‘Professor Blackett’s views’, 9.6.41.
69 SxMs29/5/2/10, ‘Visit to Bragg’, 5.6.41.
70 SxMs29/5/2/14, Kits van Heyningen to Crowther, 31.8.41.
71 SxMs29/5/2/14, Crowther to numerous contributors, 29.12.41.
life and communicate with one another.’ Note the conventional separation of pure and applied science here; MSN was not explicitly to promote the arguments of the SRS group. MSN was ‘designed to assist the public to follow these scientific developments, which are the essence of modern life.’\textsuperscript{72}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{msn.jpg}
\caption{The first number of MSN. A single sheet of paper, folded once, created four pages which contained paragraphs of science news, accompanied by illustrations. From January 1944, the heading was coloured green. Crowther chose the typeface.}
\end{figure}

\textsuperscript{72} MSN, August 1941.
Nature welcomed MSN, remarking that Crowther’s ‘name will be sufficient guarantee that the material presented will be both accurate and readable.’ Charles Singer congratulated Crowther on the ‘most attractive sheet… Personally I should like the paragraphs to be longer but I know the difficulties. I do hope that you will use diagrams freely.’ By 1945, according B.M.H. Tripp, the Assistant Editor, ‘More than ten thousand readers from all quarters of the globe have written letters asking that they might be placed on the mailing list.’ In the same year, the circulation was 65,000, and the sheet appeared in Arabic, French, Portuguese and Spanish (Crowther also considered printing a version in Basic). The press were allowed freely to copy material from the newsletter, with due acknowledgement. MSN therefore resembled Science Service in the USA and, particularly after December 1941 when it could be distributed in Britain (thanks to a greater paper ration), MSN effectively rendered Zuckerman’s project obsolete. Indeed, amongst those asking for copies of MSN was Tom Harrisson.

MSN paragraphs, though not confined to British science (they might better be characterized as focusing on Allied science), chiefly celebrated British achievements — this was no problem for Crowther, because he shared in the conspicuous nationalism amongst the left in these years. Indeed, though Crowther’s internationalism, and his desire to promote contacts between scientists of different nationalities, is undeniable (and has received attention elsewhere), less has been made of the fact that Crowther — lamentor of British decline — was primarily employed to publicize British science. We have already seen, in the last chapter, how Crowther and Hogben attempted to contribute to a native Marxism. Since the outbreak of the war Crowther had — like others —

73 Nature, 6.9.41, 283.
74 SxMs29/5/2/3, Singer to Crowther, 28.8.41.
75 SxMs29/5/2/6, The British Council Science Department Outline of Activities (1945), 10.
76 Diane Jane Eastment, ‘The Policies and Position of the British Council from the Outbreak of War to 1950’ (University of Leeds Ph.D., 1982), 79.; SxMs29/5/2/6, British Council Science Department Outline of Activities, 10; SxMs29/1/5/6, Crowther to Ogden, 28.3.44.
78 SxMs29/1/5/3, Harrisson to Crowther, 9.3.42.
79 A trend pointed out by Edgerton, Britain’s, 153; Richard Weight, ‘State, Intelligentsia and the Promotion of National Culture in Britain, 1939–45’, Historical Research, 69 (1996).
rediscovered Britain. Shortly after he started at the Council, the long and uneasy pact between Nazi Germany and Soviet Russia came to a dramatic end. Crowther was certainly delighted about this, as he was when the USA entered the war at the end of 1941. He celebrated, like many other Britons, the Red Army’s endurance, and began to speak at public events on the USSR. But since the summer of 1940, Britain had proved that it could survive, just about, without these two great powers. Strikingly, Crowther was forced to admit that he had been wrong about British decline. This was demonstrated in Crowther’s report on the state of British science, which he drafted in December 1942 in response to a request about British science from the Russian physicist Abram Joffe. Here, Crowther noted that such achievements as success in the Battle of Britain, based upon superior aircraft and radiolocation, and discovery of how to combat the magnetic mine, ‘considerably surprised the world.’ Fascist propaganda ‘had sedulously asserted that British science & technique were out-of-date, and declining.’ The reality was that British science gave a deceptive appearance of obsolescence — for example, even new laboratories looked from the outside like gothic castles. And as ‘the classic country of private enterprise and individualism’, Britain’s heterogeneous scientific institutions had developed independently. But ‘a network of interrelations and coordinations’ linking the various institutions had ‘grown steadily’, and this network constituted ‘a system of informal planning.’ True, Britain’s scientific activities, resources and abilities had not been exploited ‘with maximum efficiency’ until the war began, but a healthy science did exist. Science in Britain was ‘like a wild forest, which is in process of being pruned.’ Its ‘oddness and variety’ concealed ‘much ability and an undergrowth of planning. The result is a pleasant surprise for our friends, & consternation for our enemies.’ Clearly, there was a desire here to emphasize Britain’s strength to an ally, but Crowther expressed very similar sentiments at the BAAS ‘Science and World Order’ congress, and this about-face was entirely consistent with Crowther’s views. Science was so indissolubly linked to the vigour of a country that Britain, because it had

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81 Field, Blood, 319–322 for ‘Russomania’. Crowther’s writings on Russian science did not stop after the 1930s, as Chilvers, ‘Dilemmas’, 429, claims.
82 SxMs29/5/2/5, ‘Science in Britain: I’, 13.12.42.
83 The Advancement of Science, January 1942, 96–97.
survived the Nazi onslaught, must have a healthy science and a degree of planning (unlike France, which succumbed because of its sick science). If it had pulled through without it, where would this leave the argument for planning?

If the war forced Crowther to rethink his opinion of British science in general terms, his experience at the British Council reinforced his belief that science was undervalued as an aspect of culture. The Science Department was assigned a dingy, small corner of the building in Hanover Street, a space incommensurate with its importance, in Crowther’s view. The department also occupied a lowly position in the hierarchy of the Council, under the Education Division. Crowther therefore had no direct contact with the Secretary-General or the Finance and Agenda Committee. ‘Hence discussions on science policy are taken without direct explanation by the Science Department’, as Crowther wrote. He desired the creation of a Science Division, ‘of equal status with the Education and Press Divisions, and it should work directly under the Secretary-General’, and therefore have input into the British Council’s policy. Scientific input was necessary, as ‘Cultural activities will become more and more concerned with science, as science permeates more and more deeply into all aspects of life’. Currently, however, ‘the Secretary has been with the Council for more than a year, and has had scarcely ten minutes’ discussion of scientific matters with the Secretary-General and the Chairman.’ This meant that, for example, Crowther was not consulted by the Film Department about a science film; nor was he invited to discussions between the MoI and the Council about cultural exchange with the USSR. At bottom, it was a matter of principle: ‘Are science activities to be managed by scientists or non-scientists? The modern trend is for scientists to manage their own affairs, on an equality with other sections of the community.’ It was like the OUP all over again, with the conservative old guard stifling progress. In this case, the institutional subordination of the Science Department hindered Crowther’s vision of the Science Committee as ‘the central organ for publicizing the British contribution to science.’ It could promote an attitude of rational selfhood to the

84 SxMs29/5/2/5, ‘The Science Department’ [undated].
85 SxMs29/5/2/5, ‘The Place of the Science Department in the Organization of the British Council’ [5 September 1942], 3, 5.
86 SxMs29/5/2/5, ‘The Science Department’ [undated].
whole world by providing it with ‘a comprehensive and continually developing panorama of scientific activities’ that would ‘raise and extend the appreciation of science in all countries’ through ‘better science news for the press, better science broadcasts, better science films, better popular science books’.\(^87\) It was not to be.

Social Relations of Science

In 1942 Bragg, who had been supportive of the British Council, died. Where he had complimented the ‘newer generation’ who were considering ‘a new problem — the relation of those facts [of nature] to society and to the government of nations’, his successor, the physiologist and President of the Royal Society, Henry Dale (1875–1968), warned that ‘the new demands for full association between science and Government might go too far if the hopes of the more enthusiastic advocates were achieved’.\(^88\) According to Crowther, Dale — in alliance with A.V. Hill, now Independent Conservative MP and a Secretary of the Royal Society — ‘used his position to destroy [the] authority & development of Science Committee of B.C.’\(^89\) Jones tends to attribute this quarrel (which the Royal Society won) to institutional rivalry, however in this section I will suggest that it was more about respective visions for science and the scientist in the twentieth century, and of the role of an interpreter of science. The controversy suggests that it was still unclear how much control the government (and therefore the public) should have over the scientific activities that it financed. A crucial context was the publication of Crowther’s *Social Relations of Science*, which appeared in the same month that Crowther started at the British Council. Dale and Hill defended the tradition of the Royal Society, and the scientific method, from claims that science should have social and public functions. The British Council, funded by the Foreign Office, was ultimately accountable to the public — this was a progressive

\(^{87}\) SxMs29/5/2/5, ‘The Place of the Science Department in the Organization of the British Council’ ts [September 1942], 6.

\(^{88}\) Compare MG, 2.12.40 and 2.12.41.

\(^{89}\) SxMs29/5/2/5, note on British Council.
development in Crowther’s eyes, and he resisted the influence of the Royal Society, a private institution with a ‘narrow outlook and tradition’.\textsuperscript{90}

\textit{srs} appeared on 22\textsuperscript{nd} April 1941. Published by Macmillan, and produced in the USA, it sold reasonably well in spite of supply shortages.\textsuperscript{91} In July, Macmillan reported that ‘the book is progressing slowly but pleasantly’ in these ‘difficult days for scholarly and important volumes’; around 640 copies had been sold by the end of the month.\textsuperscript{92} ‘Quite a number of people’ spoke to Crowther about the book, but many had difficulty acquiring a copy, and had to send to America for it. Copies were also hard to find in Manchester — the institutional home of Blackett and Polanyi, and a key location in debates about planning — according to Crowther. By March 1942, a reprint with corrections was needed, and in the second half of the same year Macmillan sold 430 copies. ‘I do hope it will not go out of print again’, Crowther wrote. ‘As you know, I am most anxious that it should not become unobtainable, for the subject is a very live one, \& will remain so for years.’\textsuperscript{93}

Crowther’s eagerness to keep \textit{srs} in print throughout 1942 and 1943 is understandable. 1942 saw discontent about the conduct of the war — particularly production inefficiencies — while 1943 saw a gradual turn towards consideration of the post-war order (after the conflict turned in the Allies’ favour at the end of 1942).\textsuperscript{94} \textit{srs} could help contribute to critique and reconstruction. As Richard Gregory wrote in \textit{Nature}: ‘the deplorable social and international conditions in the world to-day demand that heed should be given’ to Crowther’s proposals.\textsuperscript{95} Existing discussions among historians of the debate between freedom and planning tend to focus on Bernal and Polanyi.\textsuperscript{96} Though contemporaries certainly related Bernal’s and Crowther’s books, \textit{srs} was distinct in being less programmatic than \textit{Social Function of Science}: rather, it was an account of the

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\textsuperscript{90} SxMs29/5/2/6, notes dated 20.12.43.
\textsuperscript{91} Records of Macmillan and Co. Ltd, University of Reading Special Collections (hereafter \textit{mac}) \textit{cro}, Crowther to Macmillan, 7.4.41.
\textsuperscript{92} SxMs29/11/5/5, Macmillan to Crowther, 15.7.41 and 29.7.41.
\textsuperscript{93} \textit{mac} \textit{cro}, Crowther to Macmillan, 27.7.41, 1.3.42, 8.3.42, 9.4.43 and 29.10.43.
\textsuperscript{94} Field, \textit{Blood}, chs. 8–9; Edgerton, \textit{Britain’s}, 155.
\textsuperscript{95} \textit{Nature}, 5.7.41, 4–5
\textsuperscript{96} See, most recently: Nye, \textit{Polanyi}, 213–218.
historical conditions under which science flourished. As Naomi Mitchison, Haldane’s sister, wrote in the Labour Tribune: ‘None of it is strikingly original, as it has been already collected by such authors as Singer, Pirenne, Childe, Hogben, Bernal and Crowther himself. But it has never been put together before, nor with this commentary.’ It was, in other words, the work of a specialist-generalist that resembled ‘a Wellsian outline of history’. Many of the positive reviews agreed with the verdict of Humphrey Pledge, author of Science Since 1500 (1939), that though SRS did not sufficiently analyse “cause & effect” in the sphere of “soc-sci-rels” it was ‘the wiliest reconnaissance yet, and much the likeliest to reach a wide public.’ Perhaps because of its potential appeal to a broad audience, SRS appeared — as Crowther said to a friend — ‘to the accompanying howls of the extreme laissez-fairists’. Crowther was probably referring to his main antagonist, Hayek, who during the war was installed in Cambridge writing The Road to Serfdom (1944).

Crowther finished writing SRS in January 1940, before the Battle of Britain had revealed an undergrowth of planning. Sometimes, he wrote to the physicist Karl Darrow in November 1940, he forgot that he ‘ever wrote’ the book. It was a book of two parts: the first an account of the origins of the scientific method; the second — ‘in silent contrast with the historical facts in the earlier part’ — of the state of contemporary science. It bore the marks of Crowther’s ‘Western turn’, with a chapter devoted to praising ‘American Foresight’, particularly Hoover’s and Roosevelt’s reports on social and technological trends, which Crowther clearly saw as a necessary precursor to effective planning. At a time when Hitler and Stalin were formal allies, Crowther set himself the task of

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98 Tribune, 13.6.41.
100 SxMs29/12/11/3, Pledge to Crowther, 25.6.41.
101 SxMs29/12/4/5, Crowther to Lauwerys, 23.5.41.
102 Jones, Masters, 58.
103 SxMs29/1/3/5/1, Crowther to Darrow, 1.11.40; ‘To the historian the second half of 1940 is a different world from September 1939’: Ross McKibbin, Parties and People: England 1914–1951 (Oxford, 2010), 117–118.
104 SxMs29/1/3/5/5, Crowther to Henry Hart, 29.3.40.
105 Crowther, Social, 558–575.
delineating a way of achieving a more satisfactory balance between freedom and organization: he was privately convinced that ‘society need not relapse into anarchism or fascism’. Indeed, conceiving of the debate as ‘freedom versus planning’ dichotomizes too much, and conceals a spectrum of opinion. Some, like the physicist Max Born (1882–1970) were (as he told Polanyi) ‘violently opposed to our western system of profit and vested interests’ but considered it ‘a tremendous mistake and danger to couple the questions of economic liberty (for the private enterprise) and of freedom of thought.’ For Born, economic planning could coexist with freedom of thought. Others, like Polanyi and Hayek, rejected economic planning if it led to restrictions on thought. Crowther, on the other hand, admitted that planning led to restrictions, but sought for ways to limit those restrictions.

Crowther began by asserting that freedom — like managed currencies — was ‘a sensible idea.’ Personal and political freedoms were particularly associated with English character and traditions, influenced as they were by England’s isolation. Elsewhere, Crowther even attributed Britain’s heritage of expositing science to its ‘tradition of freedom and democracy’, thereby writing himself into that tradition. But individual freedom he thought incompatible with the modern machine age: he saw a parallel between freedom and small-scale machinery, which he contrasted with organization and large-scale machinery and communications. In particular, the aeroplane exposed citizens ‘to a new degree of danger’ which made them ‘more susceptible to the psychological suggestions of radio propaganda.’ Moreover, ‘Some modern processes cannot be operated by even the largest private firm at their maximum efficiency because they are too big and complex.’ In other words, the trend towards what would become known as Big Science had been negative, and had detached freedom and democracy from its concrete roots in private property and small machinery. A return to freedom could be achieved in a number of ways: state ownership of capital and big machinery, with a political party controlling the state, was one solution. But

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106 pp, Box 4, Born to Polanyi, 31.7.41.
107 Crowther, Social, xxvi.
108 The Advancement of Science, January 1942, 97.
109 SxM829/12/41/10, Notes on Freedom & Organization, 5.11.39.
‘Contemporary events show the difficulty of governing this sort of state without a powerful police.’ Presumably, this was a concession to the existence of the Stalinist purges. Crowther put more hope in the development of science, which would eventually produce new concrete ‘counters’ for freedom. In 1937, he strikingly prophesied a time when everybody would possess their own radio-transmitter, small enough for coat pockets. ‘Governments will not easily censor the messages transmitted by so many millions of individuals. So it is possible to hope that radio, which at present aids dictatorship, will presently work in favour of democracy.’

Joseph Needham seized on this suggestion to support his argument that rather than abandoning democracy, humanity should ‘mechanize’ it, thereby making it more efficient.

In addition to these mobile radios, important features of the universe may be summarized in a few formulae, so that everyone may carry in his head the theoretical equipment for solving from first principles any ordinary problem arising in daily life. If science developed to this stage, it would provide new concrete bases for freedom.

It is surprising that reviewers, and especially Hayek, did not comment on these apparently fantastical anticipations, as the inherent limitations of the human mind became one of Hayek’s main objections to planning: no one, he argued, could retain the necessary amount of information in their minds.

It was what happened in the meantime, before this technological utopia had arrived, that most incensed Hayek. Briefly, Crowther urged scientists to choose whichever system of government supported science, even if it entailed a restriction on freedom. ‘The greatest service that can be rendered to science in a period of crisis is to assist the struggle of the progressive class for power, so that this can be completed with as little trouble, and as quickly as possible.’ Stalin’s use of inquisitory methods, Crowther implied, resulted from ‘The hindering of the struggle of the progressive class’, and these methods ‘may extend to a degree which draws protests like Milton’s from its own supporters. Milton’s protest was correct, but the determination of the Cromwellians to win was more correct, even

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110 Crowther, _Social_, xxv, xxvi, xix.
111 Needham, _Time_, 165–166.
112 Crowther, _Social_, xxvii.
113 Jones, _Masters_, 59–60.
if they had to use inquisitory methods.’\textsuperscript{114} Such chilling remarks seemed ambiguous to some readers. In 1943, sapper Lawrence Sandford, one of many servicemen who filled their hours with books (he read \textit{SRS} twice with his colleagues and looked ‘forward to the day when such an outlook as yours will be the common property of all, scientists and the non-scientific alike’), thought that in war

scientists will have to consider the social structure of the warring states, and the part that they are playing in helping or hindering the progressive development of mankind, before considering their position as regards the progress of science purely and simply.

When Italy invaded Abyssinia, for example, it would have been confusing for scientists to know which country to support.\textsuperscript{115} For Hayek, too, (writing in \textit{Nature}) Crowther’s comments seemed to justify ‘all the persecutions of men of science by the Nazis after they came to power... for were not the latter then a “rising class”?\textsuperscript{116} Having read this, Crowther was tempted to engage in public controversy, something that he rarely did, and he drafted a reply to Hayek.\textsuperscript{117} Far from being a rising class, the Nazis were ‘the leaders of a degenerate bourgeoisie making a convulsive effort to retain power by the exploitation of demagogy and violence.’ The working class, ‘of which scientists form an important section’, were currently rising, and the rejection of inquisition was as pernicious as pacifism or social anarchism. Had Hitler been shot during the Weimar Republic, ‘the world might have been spared immense suffering.’ Hayek’s ‘Lumping Nazism & Communism together because they use the same weapons (which incidentally we use ourselves in the form of Defence Regulation 18B) is as stupid as it is tactless’, Crowther concluded.\textsuperscript{118}

Hayek’s criticisms of Crowther went to the core of the proper function of an interpreter of science, as Hayek saw planning as undermining freedom and therefore truth. Indeed, he regarded \textit{SRS} as deceitful propaganda. In his \textit{Spectator} review, he seized on Crowther’s assertion that scientific journalists tried ‘by

\textsuperscript{114} Crowther, \textit{Social}, 332.
\textsuperscript{115} SxMs29/1/3/6/1, Sandford to Crowther, 6.3.43.
\textsuperscript{116} \textit{Nature}, 15.11.41, 584.
\textsuperscript{117} To my knowledge, this reply was not published.
\textsuperscript{118} SxMs29/12/4/3, letter about Hayek, 22.11.41, 3, 5, 6.
continuous impersonal accounts to create the scientific attitude required to solve present social problems.“If this means’, Hayek jibed, ‘that his duty is to camouflage propaganda for political ideals by competent and interesting discussion of problems within his proper sphere this aim has rarely been more successfully achieved than in this book.’ The propaganda, of course, was for ‘a modern version of the materialist interpretation of history and a kind of Neo-Marxist socialism’. But these values, on which Crowther’s argument depended, were not made clear. The preface to Road to Serfdom, by contrast, frankly announced that ‘When a professional student of social affairs writes a political book, his first duty is plainly to say so. This is a political book. I do not wish to disguise this’. He referenced Crowther in his chapter on ‘The End of Truth’, where he noted that totalitarianism tended to release and withhold information depending upon its ability to reinforce the ends of the regime, something that applied ‘even to fields apparently most remote from any political interests, and particularly to all the sciences’. The implication, that as head of a government department responsible for promoting British science, Crowther would subtly propagandize for socialism, would surely have been clear to readers. However, it is worth noting that Hayek conceded that the first half of SRS was ‘brilliantly done… It makes fascinating reading. The lucidity and terseness of the exposition deserve high praise, and the author’s idiosyncrasies break through only rarely’. Even Crowther’s bitterest political opponent, then, acknowledged his talents, and quite generously. Yet the underlying interpretation overshadowed, and was disguised by, Crowther’s pithy synthesis.

In Road to Serfdom, Hayek identified the attempt to condition reflexes that motivated the totalitarian propaganda typified by SRS, and pointed to its dehumanizing implications. Propagandists were driven, he said, by a new belief that ‘environmental factors’ made people think in ‘well-worn grooves’; these factors could be controlled, and propagandists aimed ‘to use this power

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119 The significance Hayek placed on SRS is indicated by the fact that he had read ‘more than half’ of the book by 1st May and had written a review less than two weeks later: PP, Box 4, Hayek to Polanyi, 1.5.41.
120 Spectator, 16.5.41, 531.
121 Hayek, Road, v, 119.
122 Spectator, 16.5.41, 531.
deliberately to turn the thoughts of the people in what [they] think is a desirable direction. It followed that anybody expressing truths counter to this direction would be suppressed. Indeed, the views exhibited in SRS, derived from Comte, led to ‘spiritual tyranny’. Here Hayek echoed J.S. Mill’s description of positivism as ‘the completest system of spiritual and temporal despotism which ever yet emanated from a human brain’, which Hayek quoted in the same month in *Economica*. There he noted that Comte’s perfect social order needed a moral code, to be decided by a “Government of Opinion”. And the values in SRS were not reassuring: ‘European civilisation since the Renaissance stands… for everything which the author hates most: individualism, commerce, abstract thinking and humanistic and literary education.’ Sir J.C. Squire put the same point in a different way in a prominent and not altogether negative review in the *Illustrated London News*: ‘The author seems to have investigated, and made notes about, everything in the world except the human soul — for which, incidentally, we are fighting.’ The ends of a planned society, and who would determine them, also exercised C.E. Lucas, the reviewer of scientific books for F.R. Leavis’s *Scrutiny*. Lucas diverged from Hayek in believing that ‘arguments for planning in general seem to be unanswerable’, but he also thought that neither Bernal nor Crowther had a sufficient end in view. In seeking such an end, Lucas turned to the arts, which ‘set up human standards arising from human emotions or feelings when confronted with the external world. From them we can obtain a guide to our actions and motives’. Unfortunately, according to Lucas, the respective languages used by art and science meant that they were not only separated from each other, but from the general public. Scientists tended to dismiss the arts, or — in Bernal’s case — subsume them within science. ‘A tendency to academic specialization (which they so often deplore on other grounds), mixed too often with genuine ignorance, may lead to this attitude.’ Overall, *Scrutiny* thought that Bernal, Hogben and Crowther confused means and

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123 Hayek, *Road*, 122.
124 *Economica*, May 1941, 132.
125 *Spectator*, 16.5.41, 531.
126 *Illustrated London News*, 10.5.41, 596.
127 *Scrutiny*, June 1941, 102; *Scrutiny*, June 1939, 104–105.
128 *Scrutiny*, June 1941, 100–104.
ends, and had little idea of what science should be planned for. In other words, people did not just need food, water and shelter; Scrutiny also wanted to take into account happiness, leisure, aesthetics, and so on. The journal saw these ends being guided by the arts and literature, which illuminated society more brightly than sociology.\(^{129}\) Lucas’s reviews foreshadowed the later two cultures debate, when Leavis argued against economic performance as the supreme achievement and aim of society.

While debates over freedom/truth and planning/propaganda largely divided, as Edgerton writes, along conventional political lines, the ‘Marxists’ were not a homogeneous group: politically speaking, it is important to note that Crowther found himself in the middle again.\(^{130}\) On the one hand, his advocacy for planning and — in consequence — the Soviet Union, upset Polanyi, who felt

> quite friendly towards most of your book. It is only when you refer to scientists in the USSR that my feelings are wounded. Do you really know so little about their state of mind? Or care so little for their sufferings, that you can overrule all natural sympathies by a sense of political duty? It is a mystery to me, as, I am afraid, my position remains a riddle to you.\(^{131}\)

On the other hand, after Operation Barbarossa, Crowther’s comments on the USSR appeared a little too equivocal. At least, that’s how they seemed to Haldane, who reviewed SRS in World Review having recently joined the CPGB. Crowther’s comments, about scientists being imprisoned and shot in the USSR, and theories being suppressed, ‘do not accord with the facts known to me concerning Soviet biology.’\(^{132}\) Russia and Britain were now allies, and Haldane’s support for the former was definite, in spite of the Lysenko affair, reports of which had entered the West (and Haldane represented as a scientific disagreement).\(^{133}\) More generally, Crowther ‘explains too much… His interpretation of history is partly Marxist. But not wholly so.’ Still, the book would help create ‘a new world in

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130 Edgerton, *Britain’s*, 140.
131 SxMs29/12/11/3, Polanyi to Crowther, 20.1.42.
which science is neither a hobby of professors nor a slave of dictators, but a working part of a democratic society.'

Haldane’s review was generally favourable, indicating the success of ‘Prof.’ Crowther’s specialist-generalist niche (‘Crowther is a man of very wide learning, and I am quite sure that if I had tried to write his book I should have made many worse mistakes’), but he had ‘one serious bone to pick’ with Crowther; it centred on his frequent claim that scientific journalism had to be performed by a dedicated practitioner. Crowther’s comments on this score were being listened to: Waddington worried about accepting £5 for a 1,200 word article because, as he said to Haldane, ‘Crowther, in his recent book, speaks of people who take £5 fees as blacklegs’. Haldane agreed that £5 was too little, because he ‘object[ed] to the tendency of publishers to exploit scientists.’ He did not agree, however, that research scientists should stay away from scientific journalism. He found that he ‘published rather more purely scientific work’ when he wrote his weekly Daily Worker article ‘than I had ever done before, besides doing work for the Services which is quite rightly secret, making about a hundred speeches a year and writing books on other subjects.’ Far from damaging a scientist’s research, as Crowther asserted, Haldane’s experience suggested that regular interpreting for a wide audience could stimulate experimental work. ‘I believe a number of other scientists could take up journalism if they would only realise that writing an article may demand as much technical skill as performing an experiment.’

Haldane and Crowther agreed, then, that scientific journalism should be taken seriously, as an intellectual and practical endeavour on a par with science itself, but Haldane thought scientists could also do journalism (whereas Crowther would have preferred it if they did not). Haldane’s criticisms of Crowther are a reminder that the left was divided on certain issues, too.

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134 World Review, August 1942, 30.
135 Haldane/5/2/5/28, Waddington to Haldane, 19.11.41.
136 Haldane/5/2/5/28, Haldane to Waddington, 24.11.41 and 13.11.41.
Dale and Hill followed these debates about the role of science and the scientist with consternation, and made their own interventions. In 1940, Dale had sent Hill a copy of Polanyi’s ‘Rights and Duties of Science’, which defended science as a search for truth; Hill read it ‘with pleasure & admiration.”¹³⁸ He had also evidently read Hayek’s review of SRS, writing in the same month that ‘Bernal and company are using science as a cover for political propaganda’.¹³⁹ In his 1941 Presidential Address to the Royal Society, Dale warned of the danger to the freedom of science if it became ‘entangled in controversial politics’.¹⁴⁰ Alluding to Polanyi’s essay, Dale attributed to the Royal Society a key role in safeguarding the purity of science: it should ‘keep watch’, he warned, and ‘stand without compromise for the right and the duty of science to seek the truth for its own sake in complete freedom from any kind of extraneous influence.”¹⁴¹ Meanwhile, Crowther was enthusiastically publicizing the USSR in the Spectator.¹⁴²

From Dale’s point of view, the Science Committee was an upstart organization that had poached on the Royal Society’s territory. Traditionally — and tradition was an emphasis in Dale’s Presidential Addresses — international relations in science were the Royal Society’s responsibility, but the Foreign Office now tended to consult the British Council. Dale’s proposed solution was to disband the Science Committee, and re-form it with Royal Society representatives.¹⁴³ According to Crowther, Dale realized that the Council’s scientific activities ‘are so promising that the Royal Society wants to grab hold of them, & control them.”¹⁴⁴ Crowther privately wondered whether ‘the Director of the Science Department [is] to become a clerk to the Royal Society, paid by the British Council?’¹⁴⁵

¹³⁸ PP, Box 4, Hill to Polanyi, 30.1.40; M. Polanyi, ‘Rights and Duties of Science’, The Manchester School, 10 (1939).
¹³⁹ Quoted in McGucken, Scientists, 288.
¹⁴¹ MG, 2.12.41, 6.
¹⁴² Spectator, 16.1.42.
¹⁴³ Jones, ‘Crowther’s’.
¹⁴⁴ SxMs29/5/2/5, ‘Science Committee of the British Council’, 14.10.45, 3–4.
¹⁴⁵ SxMs29/5/2/6, notes dated 19.12.43.
1944 review in the *New Statesman*, Crowther attacked the Royal Society for its professional aloofness: its founders in contrast ‘were in the closest touch with Court and Government, and many of their active members were statesmen.’ It now had few administrative staff, and a small income: ‘if the Royal Society is not to reform its nature on the original Baconian lines, its role will be mainly one of fostering and encouraging, with the sustainment of quality.’

‘We all admire’, the physicist Edward Andrade wrote in reply,

> Mr. Crowther’s boundless energy and disinterested zeal, and the extensive office organisation which he has set up is recognised as a model of its kind, but some of us could wish that his vision of historical fact... was a little less deflected by his political and social outlook.

As Hill wrote to Polanyi, the review ‘is only his usual comic stunt of saying that Russia should be our model in everything: in this case the Royal Society should model itself on the Soviet Academy and throw all its high principles of the last hundred years to the winds.’ But the ‘comic stunt’ had potentially serious implications: Richard Gregory told Polanyi that so long as the Royal Society existed, ‘there will be no possibility of scientific authority being undermined in Great Britain’. If Crowther succeeded in establishing the British Council as a department of government — thereby usurping upon many of the Royal Society’s functions — scientific authority, freedom and truth would be at risk.

Dale and Hill would have found much in *SRS* to worry them, as Crowther attacked the academy. ‘There are some slightly acrid effusions put in for the purpose of smoking the isolated academic purist out of his ivory tower’, noted Clifford Furnas, the Yale Professor of Chemical Engineering who had reviewed *American Men of Science* favourably. Crowther harked back to an idealized view of the early Royal Society, which had developed under Francis Bacon’s unspecialized inspiration and was committed to ‘planned research for the benefit of mankind’. But with the reforms of the nineteenth century, only specialists could be members, and the Society ‘became a highly professionalized body... the
attention of its Fellows was withdrawn more and more from the wider aspects of science. Interest in the social relations of science therefore ‘passed largely from the professionalized scientists to men outside their organizations.’ Wells, ‘The most eminent living English student of these relations’, was not a Fellow of the Royal Society, but during the seventeenth century would surely ‘have been one of its most brilliant members.’ Crowther wanted a return to a broader science, which considered science in its relation to the whole of society and culture. He was not alone in thinking that the impetus for this would come from outside the universities. In *Science for the Citizen*, Hogben wrote that ‘Men and women who bring the live curiosity and painstaking industry of the naturalist to bear on problems of contemporary society will not be products of an established social culture.’¹⁵¹ In *SRS*, Crowther claimed that ‘Scientific journalists have done much to stimulate the new interest in the social relations of science’, as they naturally had to consider those relations, so it was presumably not just Wells who deserved to be a member of the Royal Society. This was no wild suggestion in Crowther’s eyes, because ‘the next advance towards this improved scientific method may be found through a combination of the present scientific method, which is generally conceived as independent of society, with social understanding.’ This blend could ‘lead to the solution of problems at present quite beyond human powers.’¹⁵² With *SRS*, Crowther therefore attempted to write himself into the history of the scientific method, having retrieved that method from aloof professionals like Dale and Hill.

Privately, though, Crowther was despondent. ‘I don’t think our generation are ever going to have much say in things’, he complained to Rowse in 1942. ‘It is virtually impossible to take a leading part in affairs after being kept out of them for twenty years.’ Rowse had sent Crowther a copy of his *A Cornish Childhood* (1942), which demonstrated ‘the toughness of the ignorance & stupidity that has to be contended with’. Some of their generation’s ideas had been adopted, but ‘the Conservatives are kindly offering to take them over, & administer them in their own interest.’ The time was coming to hand over to the younger generation, ‘who

take our ideas for granted, & may not be kept out of power for half their lives.’ The outlook for them was ‘not too bad. Transport, communication, nutrition, practical economics, are much better understood’ and progress did ‘not come from progress in morals, but in making the ordinary problems of life simpler through the provision of better technique. When life is simple, human beings behave quite well, when it isn’t they don’t.’ This elementary formula for the good life seemed ‘to be the conclusion since the entertaining days of 1920! May the joys of the youth of 1950 prove more durable and effective!'\textsuperscript{153}

By the end of 1945, Crowther was ready to resign in protest at Dale’s attempts to control the British Council’s science activities. This decision was precipitated by the resignation of the Conservative chairman of the British Council, Malcolm Robertson, by the election of Labour in July 1945 and by the atomic bombings of Hiroshima and Nagasaki in August. All, Crowther wrote to Needham, ‘have produced interesting changes in the perspective of my own particular world. It is in a state of pregnant paralysis.'\textsuperscript{154} He had, he wrote in a memorandum two months later, only accepted the British Council role ‘as the duty of a man of the Left, to hold the fort... until there was a Labour government’ who could purge the reactionaries. He considered it ‘natural that the protagonists of the Left should be protected by the Labour Ministers.'\textsuperscript{155} He therefore asked that the reorganization of the Science Committee be delayed until the appointment of a new chairman, and spoke to R.H. Tawney in August about the ‘need for strong, progressive chairman & distinct new foreign policy.'\textsuperscript{156} In particular, Crowther believed that Britain’s future power lay in culture, especially ‘with regard to USA & USSR owing to their relatively increasing material power.'\textsuperscript{157} In the meantime, if the left did not get rid of the reactionaries, ‘the Conservatives will be able to retain control by securing the key positions in the administrative machinery; already Hill was ‘manoeuvring into a controlling position in the Science Committee.’ If Labour supporters were ‘manoeuvred out of their

\textsuperscript{153} EUL MS113/5/1/c, Crowther to Rowse, 9.6.42.
\textsuperscript{154} SxMs29/1/3/6, Crowther to Needham, 15.8.45.
\textsuperscript{155} SxMs29/5/2/5, ‘Science Committee of the British Council’, 14.10.45, 32–33.
\textsuperscript{156} SxMs29/5/2/5, notes dated 21.8.45.
\textsuperscript{157} SxMs29/5/2/5, undated note.
positions, under the guise of “advice”, scientific or otherwise, the progress of the Labour government will be effectively hamstrung. Do not let us be bluffed. In February 1946, Crowther finally resigned.

Conclusion

The war offered Crowther the chance to advance his prevailing aims. The Tots and Quots agenda demanding a ‘proper propaganda for science’ was certainly about encouraging the government to make better use of science and scientists in the war effort. But it was also, I have argued, about encouraging radical social change. Inculcating a scientific spirit — a cool resourcefulness — amongst civilians could encourage them to assail vested interests and class culture; that was the only way to win the war. The ‘proper propaganda for science’ therefore needs to be seen in the context of wider demands for radical reform in the 1940–1942 period. I have established that Crowther was closely involved with Pelican Books and shaped their science output in a progressive direction. Furthermore, and more importantly, I have shown that Crowther’s books were more widely read in the war years. His Pelicans reached the working classes, and SRS was read and debated by a group of radical servicemen, whose enthusiasm suggested Crowther’s impact amongst the mass of radical publications. But the wider influence of the Tots and Quots was limited in the absence of institutional support, particularly from the Ministry of Information.

Crowther’s appointment to the British Council would seem to give the lie to the two cultures argument; a government that established a department solely for the dissemination of scientific propaganda can hardly be deemed anti-scientific. Indeed, Crowther’s failure there was more to do with disagreements within the scientific community, than with the British Council’s supposed neglect, detected by Crowther, of its scientific activities. Crowther was appointed to the Council primarily because he was regarded as a disinterested generalist — he was not involved in scientific research, so would not promote particular disciplines over

158 SxMs29/5/2/5, ‘Science Committee of the British Council’, 14.10.45, 30–33.
others. However, it was his attempt to broaden the definition of science, and his criticism of the narrow professionalism of some scientists and the Royal Society, that led to his downfall. A political contest within cultural institutions ensued, informed by the publication of Crowther’s *SRS*. The defenders of freedom in science were swimming against the tide during the war; a growing consensus said that some form of peacetime planning was inevitable and desirable. Advocates of freedom feared that the British Council, funded as it was by the government, would come to serve ideology rather than truth. This was a valid concern, since Crowther spoke in *SRS* of the need for scientists to support progressive politics, and his book was exposed by Hayek — a great upholder of ‘truth’ — as duplicitous propaganda for Marxism. Crowther could therefore be seen as a propagandist, infiltrating the government to engineer the masses’ souls. However, as we have seen, *Monthly Science News* did not in fact explicitly promote Crowther’s agenda, and his editorial upheld a conventional distinction between pure and applied science. He also participated in the upswing of patriotic feeling, both personally and at the British Council. The wider point is that, in opposing Crowther and the British Council, Dale and Hill symbolized the nineteenth-century idea of science whereby government funding compromised disinterestedness. Their successful undermining of the British Council also suggests that defenders of the laissez-faire approach to science were stronger during these years than is often assumed. During World War II, then, Crowther’s claims to be an interpreter who could be considered a colleague of research scientists began to unravel.
Conclusion
A Life in Science

When Crowther died, in 1983, the Guardian’s obituary noted that while ‘many people carve out a career... few pioneer a new profession.’ Crowther had done so, setting ‘a pattern of social concern, precision and technical balance’ in the 1920s ‘which remained the hallmark of his work throughout his life.’ Anthony Tucker, then science editor, rather ambiguously called Crowther a Cambridge ‘scholar’, who had ‘post-graduate experience in research and publishing’, thus contorting Crowther’s educational background to conform with the established terminology and career paths of the 1980s. Crowther was marked by ‘extreme modesty’, a ‘concern for people’ and an ‘uncanny ability to perceive the important connections between apparently unrelated developments.’ He had ‘absolute’ integrity and ‘the quiet touch of something close to greatness: it was the touch of great goodness.’ The Times seemingly overlooked Crowther’s death, as did Nature.

Crowther’s later activities, politics and influence, especially after 1956, remain a topic for future research. How did he react to Khrushchev, Suez, the Sixties students, the election of Thatcher? Compared to the high promise of the interwar period, the post-war era must have been something of a disappointment for Crowther. In 1945, the new editor of the Manchester Guardian, A.P. Wadsworth, refused to publish Crowther’s article on the social implications of the atomic bomb: ‘To advocate completely free scientific action and publication’, Crowther wrote in protest, ‘in a new and unsuitable social context is really... a conservative and not a liberal policy... I do hope the Guardian will choose the right side in this matter, for the future of the human race depends on the education of the public through the press and other means.’ Crowther continued to contribute pieces for

1 Guardian, 31.3.83, 2.
2 Desmarais, ‘Science’, 151.
3 In 1981, the University of York gave Crowther an honorary doctorate; this was his only accolade. See the ODNB.
4 MGA B/C281/72, Crowther to Wadsworth, 12.8.45.
a few more years, but in 1953 Wadsworth admitted to Polanyi (the two became quite close) that he did not ‘want to use Crowther again.’ By then, Crowther’s energies were consumed in the Campaign for Nuclear Disarmament (CND), and in producing books set in the groove of those he had written in the interwar period. His sister, Dodo, was critical of both efforts. She said to Rowse in the 1960s, in relation to Crowther’s peace work, that ‘Jimmy was idealistically foolish to think that a man like himself — not a public figure in any way — could change the course of events. Even Lord [Bertrand] Russell has not succeeded.’ She did not read Crowther’s books, ‘because his habit of furnishing slick Freudian explanations irritates me. I think it facile & not always true.’

Crowther was certainly prolific: as Hayek wrote in a review of Francis Bacon: The First Statesman of Science (1960), Crowther’s productivity ‘does not quite measure up to Bacon’s ambitions, who at one stage proposed to write books on the various departments of science at the rate of one a month!’ But it was not far off. Crowther’s work inspired the second generation of radical scientists, as well as a generation of historians of science, yet they seemed to some readers to be period pieces, as Dodo’s comment suggests.

In Isis, the historian Nathan Reingold wrote of the introduction to Statesmen of Science (1965) that it served as a handy condensed version of some of the clichés rampant in some circles, at least, of the British Left. After all these years, it is touching still to encounter people who believe that most of the problems of the universe will vanish if the proper organization is established, in this case a most centralized one.

As far as his personal life was concerned, it seems that Crowther increasingly withdrew from the world. A 1951 Special Branch report noted that Crowther and Franziska were ‘well known’ amongst their neighbours ‘for their unconventional

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5 MGA B/195/29, Wadsworth to Polanyi, 20.1.53
6 EUL MS113/3/1/c, Dorothy Crowther to Rowse, 13.3.62.
habits’. Their flat appeared to be ‘more of an office than a home, and contains only scanty provision for the necessities of life.’ Crowther spent ‘most of his time indoors... rarely rises before mid-morning, and is often heard moving about and using a typewriter into the small hours of the morning.’ What Anthony Tucker interpreted as modesty, Rowse saw as standoffishness, whereas Dodo took Jimmy to be ‘excessively reserved and reticent.’ His politics, which hardened during the Cold War, therefore became a point of speculation between Rowse and Dodo. ‘Mother asked him a few years before she died if he were a Communist. He said no. Mother thought that perhaps his German wife was. I don’t think so.’ Still, Dodo agreed that Jimmy probably thought Rowse reactionary (as, by the 1960s, he was), and expected ‘you have grown out of him as my most brilliant pupil has just grown out of me.’ Jimmy earned only ‘a precarious living as a freelance as he has such a distaste for any form of authority.’ Overall, these portraits add up to an ascetic, enigmatic and embattled writer, determined in the course he had chosen for himself.

Crowther’s career centred on attempts to shape the public’s attitudes towards science and thus to re-shape his country’s wider culture. As a result, it exemplifies the opportunities that new media markets, mass democracy and academic specialization created for the profession of interpreter of science. As shown in chapter 1, Crowther’s initial engagement with science was deeply political, with biology and the New Psychology studied for their ability to ‘make socialists’: science and politics shaped one another, and Crowther’s eclectic, autodidactic Marxism reflected this. The insistence on a simple style in particular influenced Crowther’s emergence as an interpreter. We saw how the growing determination of roles within science allowed Crowther to create a new scientific identity, and that he conceived of his role as science in action. He mooted a scientifically-aware and class-conscious notion of literary merit, and positioned himself between the arts and the sciences to build his career. Chapter 4 turned to Crowther’s contribution to the 1930s cultural Popular Front, and his extension of scientific journalism into the history of science. Initially, World War II offered Crowther the

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10 TNA KV2/3343, Special Branch Report dated 18.10.51, 4.
11 EUL MS115/3/1/C, Dorothy Crowther to Rowse, 13.3.62 and 28.11.62.
chance to advance his aims, but once appointed to the British Council, his position started to unravel; with the publication and generally positive reception of *Social Relations of Science*, which reviewers thought could reach a wide audience, Crowther was regarded by Hayek and supporters of freedom in science as little more than a political propagandist. I want to conclude by reflecting on Crowther’s historical significance, in relation to a figure who has haunted this dissertation: H.G. Wells.

In 1934, Ralph Fox acknowledged that ‘few men can have ranged over the intellectual life of their time as freely as Wells, the great journalist and popularizer, the “encyclopædist” who for all his doubts of the future is nevertheless one of its heralds’. By the time that Crowther came on the literary scene, in the mid to late 1920s, Wells was indeed a force to be reckoned with, and it is hardly surprising that his name has appeared in every chapter of this thesis. Self-identifying as a ‘journalist’, Wells came to see his literary works as tools to effect a World State, but in doing so sacrificed art for propaganda. His later works, rooted as they were in contemporary concerns, have therefore received less critical attention than his earlier scientific romances. Crowther’s works shared some features with Wells’s — we might say that they both produced ‘literature of knowledge’, which aimed to teach rather than last through the ages. Indeed, Crowther’s interpretations were significant to contemporaries, particularly to practising scientists, precisely because they were up-to-date. Their topicality makes them compelling historical documents, evoking and shaping the character of interwar public culture.

Crowther’s later neglect has obscured the historical significance of his interwar influence. As we have followed him through the period, building a career against social, financial and institutional odds, we have seen him acting as a link between practising scientists of different specialisms and political outlooks, and between leftist scientists and members of the Bauhaus. We have witnessed him shaping the

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13 The literature on Wells is vast. For a recent biography, see Michael Sherborne, *H.G. Wells: Another Kind of Life* (London, 2010); James, *Maps*, 193 comments on the reasons for the neglect of Wells’s more educational works.
scientific content of Allen Lane’s Pelican books imprint, of Oxford University Press’s science list, and of numerous periodicals. At the British Council, he helped mould perceptions of science beyond Britain, particularly through *Monthly Science News*. Crowther’s books prompted a flow of reviews — in national newspapers, specialist journals, left-wing organs, and more general periodicals — ensuring that he reached a much wider audience than sales figures alone would suggest. Letters also revealed that Crowther’s audience was diverse, reaching from workers to practising scientists, and from sappers to novelists. His interpretations contributed to the rising acceptance of Marxism in the 1930s, and to the creation of a cultural Popular Front.

In the introduction, I rejected a number of longstanding assumptions about the early twentieth century, notably that science in public culture can adequately be described as ‘popularization’, as an essentially non-scientific endeavour. ‘Science’ is too narrowly defined by most such histories, and excluding interpretation and reception from the definition of science prevents us from appreciating its full cultural significance. In my argument, by contrast, interpreters emerge as important in the active making of scientific knowledge. Crowther built his career on the continuing fluidity within the scientific community, a fluidity that saw uncertainty regarding who counted as a ‘man of science’, a ‘scientist’, or a ‘scientific worker’. Science was undergoing great changes — more research was being funded by the military and industry, for example — which led to a certain determinism of scientific careers, but it also allowed for the invention of new scientific identities. Crowther is one example, but we have also seen how Julian Huxley reconfigured the balance between interpreting, researching and teaching in a scientific career. Individuals made the best of their circumstances, within class, social and financial constraints, as Tommy Hobson suggested. Hogben, for example, trotted the globe, changing positions and specialisms, in search of a secure income and reputation. Historians should be more alert to the varieties of scientific career that were available in the

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twentieth century, from interpreter, through academic researcher to industrial worker.

The boundaries of science, though subject to policing, were always up for (re)negotiation — one outcome of this research is the surprising lack of attempts on behalf of research scientists to exclude Crowther, at least until World War II. The wealth of material that I have cited throughout this thesis is testament to the perceived importance of Crowther’s role amongst practising scientists of many different political persuasions and specialisms. Crowther’s behaviour undoubtedly lubricated his passage through the community of practising scientists, and I have shown that gentlemanly values within science lived on into the interwar period. It was certainly possible to get on in science if one had the brains and certificates but lacked appropriate social mores, as Hogben showed. However, the complaints about Hogben’s behaviour suggest that some scientists regretted that qualifications could replace manners. Disinterestedness remained a concern, and could be compromised by accepting money for publication or by too close an association with government. Crowther banked upon worries about overspecialization, at precisely the time when the various branches of science were regarded as becoming more interdependent. The point is that Crowther’s work was of value to practising scientists, many of whom were nonspecialists in some of the subjects that Crowther covered. And at a time when advances in one area of science could depend on advances in another specialism, someone who specialized in being a generalist could make a genuine contribution to science. For example, by the 1940s, Haldane and Huxley were supporting Wells’s election to the Royal Society, despite Haldane’s prior questioning of Wells’s inclusion in the scientific community based on his lack of recent research. A prosopography of interwar interpreters, focusing on the reception and use of their work by practising scientists, would be a promising avenue for future research.

If the fluidity within science and the persistence of gentlemanly values points to the shadow cast by the nineteenth century, so do the totalizing ambitions for science revealed by contemporaries. For Crowther, science was always related to society, but where some turned to eugenics, he turned (along with other Marxists like Hogben and Needham) to Pavlov’s notion of conditioned reflexes, and
conceived of his interpreting as a science. Like other advocates of the social relations of science, Crowther wanted to change the definition of science, to harness and maintain its fluidity for his own ends. My attention to practicalities and personal life throughout — particularly to Crowther’s finances, marriages and friendships — reminds us that many of his actions and arguments are only understandable in the context of his need to earn a living and his desire to carve out a position for himself, first as a scientific journalist and later as a ‘philosophic journalist’ in the vein of figures as different as Benjamin Franklin and Wells.

Crowther’s argument that research scientists should stay in science, and not engage in active politics or interpretation, had obvious implications for his own role; Wells, as an established, rich writer, by contrast, could afford to encourage research scientists to dabble in article mongering. While Crowther’s support for the social relations of science cannot be reduced to his desire to establish scientific journalism, if the agenda of the SRS movement had been furthered, people like Crowther would have been central to the scientific enterprise. The left projected that the importance of Crowther’s role would only increase in the future, as science was increasingly funded by governments and the public. Scientists would be more accountable to the people, who would need to know what scientists were doing in order to be able to assess the claims of experts.

Despite the growth of radio and film, print remained central to the interpreter’s ability to shape the public culture of science in this period. The BBC seems less significant when seen from Crowther’s point of view, despite its gradual increase in prominence. Crowther was uneasy on the air, and saw the radio as a tool of authoritarianism, despite his dalliances with the medium. Listeners missed crucial pieces of information from broadcasts, which they were largely unable to revisit. This reminds us that there was no easy correlation between left-wing opinions, or scientific training, and embrace of new technologies. That Crowther was not a consistent presence on the radio, and that he could not appreciate John Logie Baird (one of the inventors of the television), must be central to any explanation of his comparative lack of public prominence in the post-WWII period, when new interpreters, such as Jacob Bronowski and David
Attenborough, emerged. The same developments in the media that made Crowther’s career possible also ensured that it did not blossom after the war. Interpreters advanced their political and professional aims through their work, and I have argued for a fundamentally revised understanding of Crowther’s politics, and therefore of political allegiance in the interwar period generally. I have moved away from a focus on the USSR, and the portrayal of Crowther as a straightforward Third Internationalist — not, I hasten to add, in order to excuse his more extreme positions, but to enrich our understanding of how complex and varied the responses of those with left-wing convictions could be to the events of the interwar period. In particular, Crowther’s early experience of ‘revolutionary education’ has been underappreciated, and provides an educational counterweight to his revolutionary opinions. We can also emphasize Lenin’s call for a United Front in 1922, at the time of Crowther’s politicization, which was reflected in Crowther’s uneasiness during the CPGB’s shift to a class-against-class line in 1929. Crowther embraced the return to a more inclusive Popular Front policy in 1935, and there are hints in his archive and in the draft preface to Soviet Science that he became disillusioned with the Communist Party. This places him closer to Lancelot Hogben: both Crowther and Hogben looked to the USA as an alternative form of modernity where science proceeded hand-in-hand with political experimentation. The wider historical point is that even fellow travellers had more complex politics than is often assumed, when one traces the evolution of their personal, political and professional lives, and see them in terms of identity and career formation.

Crowther’s politics evolved, from a youthful attack on Wells’s reformism to a mid-life respect for his ‘philosophic journalism’ as the sort of thing necessary to avoid fascism and war. Crowther, like Wells, saw his interpretations of science as his life’s political work. However, Crowther criticized Wells for his lack of sociological understanding; in other words, for not being a Marxist. Crowther therefore blended Wells’s prominent interpretative role with a Marxist understanding of science in society. This was as true of a straightforward exposition of colloids in the Guardian as of his more obviously political writings on planning, and is an important reason why the popularization label is
insufficient. Throughout this period Crowther repeatedly expressed his belief that science, simply explained, would help people to see capitalism clearly; they would then demand political change. This belief drew upon Comte, and also had its roots in the Plebs League, but gained renewed justification in light of the 1926 General Strike, which emerges as an event of key significance in my account, after which Crowther saw the fundamental need to condition reflexes prior to a future revolution (which he conceded need not be violent in Western countries). This idealization of science — in which science was simultaneously a product of society and the prime mover of society — amongst people like Bernal has been commented on before, however its importance in explaining the stress they placed on interpreting science for nonspecialists has not been noted. It also means that it is hard to separate political from scientific views.\textsuperscript{16} For Crowther at least, to insist on the separation is to uphold a false dichotomy. Crowther first seriously engaged with science in a political context (the Plebs League), and he attempted to reinterpret politics in the light of modern science. The point is that science and politics were equally social activities — this is particularly clear in Crowther’s comments on Pavlov’s work, and the renewed licence it gave to educational routes to socialism. Interpreters therefore acted on a constantly developing interaction of their political and scientific views. Furthermore, Crowther’s belief in the long-term political importance of his project — despite occasional private doubts — bespoke a basic optimism about the future, in spite of living through an apparently morbid age.\textsuperscript{17} Indeed Crowther and his allies either downplayed or turned to positive ends many of the intellectual currents that were commonly given a negative connotation — such as the New Psychology or eugenic degeneration. Crowther remained sanguine about the potential of Pavlovian conditioning, in spite of its apparently successful use for nefarious ends in fascist countries.

\textsuperscript{16} ‘I argue that scientific intellectuals tended to act on their prior existing political views rather than on ideas that originated from science.’ Desmarais, ‘Science’, 8.

\textsuperscript{17} ‘Despairing of the future became embedded in inter-war culture in the broadest sense of the term and in a variety of distinct literary, scientific and institutional milieus.’ Overy, Morbid, 366.
Finally, the interwar period was culturally and politically diverse. Many of Crowther’s closest friends were trained in the arts, and Crowther, like some ‘literary intellectuals’, was uneasy about science’s impact and tried, like practitioners within the Bauhaus movement, to help humanity to master the machine. He did not solely promote narrow expertise, and found scientific specialists who failed to apply the scientific method outside the laboratory more objectionable than people with no scientific training. Classicism therefore stood for a political and ideological objection to narrow specialism in general, rather than a disciplinary divide. However, these subtleties could easily be overlooked by commentators, like Hayek or C.E. Lucas, who saw Crowther as a philistine, concerned merely with material needs; thus, the groundwork for the later debate was laid. In fact, Crowther attempted to realize, in his person and in his works, the union of culture, embodied as an aesthetic for scientific journalism, that he thought could only fully happen under socialism. Politically, we have seen that the monolithic interpretations of McGucken and Werskey break down upon closer inspection: there were real differences, political and otherwise, between Haldane and Crowther, for example. Furthermore, in chapter 5 I suggested that laissez-faire scientists like Hill and Dale were stronger in this period than is commonly assumed.

Crowther was the product of, and helped to shape, a singular moment in history. It was marked by fluidity and indistinct boundaries: in science and politics, in the relations between scientists and their publics and between science and non-science, and in the role of interpreters within the scientific community. Near-universal literacy and a mass media culture created a demand for people who were able and willing to orient non-specialists (a category that included overspecialized research scientists) in relation to the scientific developments that affected their lives. Crowther positioned himself as somebody who was uniquely qualified to perform this role: as a generalist able to unify the sciences and the arts; an interpreter of science who sought to make interpreting itself more scientific; and someone who could define the role of interpreter more precisely. Above all, Crowther reflected and helped form a great confidence in the power and potential of science, properly applied and conceived of as social action, not
mere expertise. Crowther never stopped believing that by interpreting science, the
philosophic journalist could change the world.
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