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This paper examines the cultural reasons why in 1964 the Royal Institution (RI) selected George Porter, who became the only person so far to have been Director of the Royal Institution (1966–85), President of the Royal Society (1985–90) and President of the British Association (1985–86) at the same time, to succeed William Lawrence Bragg as the institution’s scientific director and resident professor. Porter was established as first choice by an inner group of RI Managers before the formal selection process began. In this article I argue that Porter won their favour by presenting himself, during his tenure as the RI’s Professor of Chemistry (1963–66), as a candidate who fitted well with the Managers’ ideas about the future role of the RI—ideas that were deeply influenced by the prevailing technocratic visions of ‘science and society’, particularly C. P. Snow’s writings on the ‘two cultures’.

Keywords: George Porter; C. P. Snow; two cultures; Royal Institution; Lawrence Bragg

INTRODUCTION

On 7 December 1964 it was decided in a Special Meeting of Managers of the Royal Institution (RI) who would be invited to succeed Lawrence Bragg (1890–1971) in his roles as Resident Fullerian Professor of Chemistry and Director of the Davy-Faraday Research Laboratory (DFRL).¹ The RI selected George Porter (1920–2002) to succeed Bragg. This article examines the unusual process by which the appointment was made and reveals the cultural influences behind the decision. In the early 1960s the RI’s administration was occupied with the question of what role the institution should play in the final third of the twentieth century. The search for Bragg’s successor became entwined with visions of the RI’s future that, I will show, were influenced by contemporary discussions about science education and scientific literacy, in particular those arising from C. P. Snow’s writings on the ‘two cultures’. I will argue that Porter, who began his association with the RI in 1960 as a

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lecturer for sixth-form students, advertised himself (intentionally or unintentionally) to the RI’s Managers as a potential successor by demonstrating that his interests and abilities were ideally matched to their sense of the RI’s traditions and desired future direction. One crucial instance I discuss and contextualize in detail is a Friday Evening Discourse that Porter gave at the RI that offered a response to Snow’s withdrawal of his famous test question of scientific literacy: knowledge of the Second Law of Thermodynamics.

**BRAGG’S RETIREMENT**

Lawrence Bragg’s appointment in 1953 was made in the wake of a bitter episode that had, according to Ronald King (1913–2000), the Assistant Director of the DFRL at the time, left the RI in ‘probably the worst turmoil it had known in the century and a half since it was established’.² Bragg’s predecessor, Edward Neville da Costa Andrade (1887–1971), had been forced to resign after much acrimony and strife, costing the RI the financially crippling sum of £7000 in damages and a serious stain on its reputation. Andrade had attempted to reform the RI’s administrative structure; sacking staff, provoking resignations, splitting allegiances and damaging institutional relations with the Royal Society in the process.³ The administrative structure of the RI, which had remained more or less the same since the granting of its founding charter on 13 January 1800, consisted of a body of 18 Managers, among them a President, Secretary and Treasurer who constituted the Officers, and a board of 15 Visitors. All elected annually by RI members, the Managers were responsible for running the institution, while the Visitors had an auditing role. The Officers, it should be noted, held the most executive power at the RI.

The conflict arose when Andrade, in his posts as Director of the DFRL, Resident Fullerian Professor of Chemistry and Superintendent of the House, had tried to seize power from the Managers (fighting in particular with the Secretary) by establishing himself as ‘Director of the Royal Institution’, a title that had never formally existed.⁴ In the aftermath of the so-called Andrade affair, Bragg nobly stepped in to rescue the institution. His sister Gwendy Caroe (1907–82) later pointed out that in ‘accepting the job in such a situation’, Bragg willingly flouted ‘professional etiquette’, and received criticism and lost friends for the decision; Edgar Adrian (1889–1997), President of the Royal Society (1950–55) and one of his oldest friends, explained that Bragg had had to accept the post ‘because no one else would’.⁵ During his tenure Bragg successfully restored the reputation and finances of the RI, introduced new courses of lectures for the public, schools, industry and the civil service, and with much diplomacy smoothed over relations between RI staff and the Managers (figure 1).⁶

As Bragg’s retirement age of 75 years approached, there was cause for concern. ‘In the relatively near future’, the RI’s President Alexander Fleck (1889–1968) wrote to the Managers in July 1964, ‘we must take decisions ... of the highest importance for the direction’ of the RI.⁷ With various committees set up in the early 1960s to plan for the RI’s rebuilding and redevelopment and for its future role as an institution, and with the memory of the Andrade affair serving as a potent reminder of the cost of bad judgement, added importance was attached to the appointment of Bragg’s successor.

Fleck conducted a postal poll among the 18 Managers to determine whether Bragg’s retirement year should be 1965, 1966 or 1967. This survey approach taken by the President exemplifies the unusual process—governed by personal opinion rather than formal procedure—by which an important RI matter was to be decided. Bragg personally...
wished to continue for a further two years beyond his formal retirement date of May 1965 to oversee, as Fleck understood, important developments in the pipeline, such as the plan to provide scientific training for civil servants (discussed below).\(^8\) The majority of the Managers voted for Bragg to stay until 1967, some specifically citing the civil service scheme as a reason, although a group of five Managers—W. E. Schall, H. E. Hopthrow, E. R. Davies, L. A. Jordan and L. B. W. Jolley—opted for one of the two earlier retirement dates.\(^9\) This group, as it would turn out, held the greatest influence in both the matter of Bragg’s retirement and the choice of his successor.

Over the summer of 1964 the RI’s Treasurer, William Ernest Schall (1888–1965), corresponded privately with the RI’s Secretary, Brigadier Harry Ewart Hopthrow (1896–1992), about Bragg’s retirement. Hopthrow, whose background was in civil and mechanical engineering, spent the majority of his career at Imperial Chemical Industries (ICI), where he was appointed Assistant Secretary in 1945.\(^{10}\) Schall’s background was in the radiology industry. He first joined the RI as a member in 1919 and served as a Manager for a number of years before becoming Treasurer in 1956.\(^{11}\) Schall had decided it was time to retire as Treasurer, although he told Hopthrow he felt it was his duty to ’stay on a bit longer’ to help guide the RI through Bragg’s retirement, adding that the experience of those who ’came
through the troubles of twelve years ago [that is, the Andrade Affair] could prove of ‘considerable help in the next year or two’—naming Managers Edward Roy Davies (1903–95, the RI’s Deputy Treasurer), Louis Arnold Jordan (1892–1964), Leonard B. W. Jolley (1886–1968) and himself.\(^\text{13}\)

Fleck told the Managers that, from the general comments of the poll, ‘it is clear … the question which occupies a very prominent place is: what manner of successor to Sir Lawrence do we hope to obtain’. On this point, Fleck said that in September he hoped to collect names and then have a discussion at a Special Meeting of Managers on 5 October 1964.\(^\text{14}\)

AN EARLY FRONTRUNNER

‘I think that you and I are agreed on Porter of Sheffield as a first choice’, Schall wrote privately to Hopthrow on 1 September 1964.\(^\text{15}\) This was the first time in correspondence that Porter’s name (or any name) was mentioned as a candidate to succeed Bragg. But how did Porter become the first choice of the Treasurer and Secretary? Possibly the earliest discussion on the subject of Bragg’s successor—and the only one before Schall’s letter on record—took place ‘towards the end of 1963’ between Hopthrow and Bragg.\(^\text{16}\) In his diary account of the events leading up to Porter’s appointment, Hopthrow recalled that Bragg would occasionally come up to the Managers’ room at the RI—where Hopthrow sometimes stayed—to consult him ‘informally’ about his retirement. Hopthrow mentioned they spoke ‘in a light-hearted way’ of a successor, reflecting that Bragg ‘seemed to have no strong view’. The biologist Peter Medawar (1915–87) was someone whom apparently both men had in mind, although they ‘doubted very much whether he would be interested’. Hopthrow remembered that it ‘obviously pleased’ Bragg when he suggested as a candidate his son, Stephen Bragg (1923–2014), then Chief Scientist at Rolls Royce. The molecular biologist John Kendrew (1917–97), an old colleague of Bragg’s and the RI’s Reader in Crystallography (1954–68), was also mentioned, as was George Porter, a photochemist at the University of Sheffield and the RI’s Professor of Chemistry (1963–66).\(^\text{17}\)

Porter had joined Sheffield in 1955, when he became the university’s first Professor of Physical Chemistry. By his own account, he had been interested in chemistry since the age of eight; an interest that was encouraged by his father who bought him in his childhood a chemistry set and an old bus where he could conduct experiments at a safe distance from the family home.\(^\text{18}\) It was during his undergraduate degree at Leeds that he developed an interest in physical chemistry, though in his third year he was directed to study radiophysics, without being told why, as part of a wartime scheme initiated by Maurice Hankey (1877–1963), the Chancellor of the Duchy of Lancaster. It may have been Charles Percy Snow (1905–80), the chemist-turned-novelist and civil servant, who personally recruited Porter, because, under Hankey, Snow was responsible in the war years for recruiting science students across the country for radar development.\(^\text{19}\) After graduating in 1941 Porter continued to study radiophysics at Aberdeen before becoming a radar officer in the Royal Naval Volunteer Reserve. After demobilization in 1945 Porter enrolled as a research student at the University of Cambridge, joining the photochemistry group of Ronald G. W. Norrish (1897–1978). His training in radiophysics and knowledge of electronics would prove useful for pioneering, with Norrish, his (later Nobel prize-winning) method of flash photolysis, which he further developed at Sheffield, where in 1963 he was appointed Firth Professor of Chemistry and Head of the Department of Chemistry.\(^\text{20}\)
Porter’s first involvement with the RI was as Salters’ lecturer for sixth-formers in February 1960. The RI had, since 1954, offered lecture courses for London schoolchildren. Initiated and organized by Bragg, the RI’s Schools Lectures (as they became known) sought to teach science and scientific principles through experimental demonstrations that were beyond the resources of schools. The scheme proved a great success for the RI, boosting the institution’s finances and public reputation. Porter had been recommended to Bragg as a potential schools lecturer by Maurice Bruce (1912–88), who was Director of Extramural Studies at Sheffield and knew Bragg through the BBC’s General Advisory Council. In January 1959 Bragg wrote to Willie Sucksmith (1896–1981), Head of Physics at Sheffield, to get a second opinion on Porter. Sucksmith enthusiastically confirmed Bruce’s judgement and described to Bragg his impression of Porter’s inaugural lecture as Professor of Physical Chemistry at Sheffield:

The way in which he interlocked a considerable number of experiments—incidentally without technical assistance, and the material of the lecture, excited general admiration, and I think you need have no misgivings about his capabilities for lectures of the type that you give to school boys and girls at the R.I.

Porter certainly lived up to the recommendations. Bragg reported to the Salters’ Company that ‘Porter’s lecture has been quite excellent’, adding ‘he has a real knack of getting it [his subject] across to the young people and has a number of fascinating chemical experiments’. Porter gave his first Friday Evening Discourse (FED)—a famous RI lecture series that dates back to 1825—in November 1960 on ‘Very fast chemical reactions’. In that year Bragg had been anxious to add a chemist to the RI’s professorial staff. The Australian chemist Ronald Sydney Nyholm (1917–71), who like Porter had impressed Bragg with his schools lectures, was appointed in 1960 as Professor of Natural Philosophy, but he resigned from the post a year later as a result of over-commitment (Porter had given his Schools Lectures for him in 1961).

In the autumn of 1962 Ronald King, the RI’s Deputy Director, asked Porter whether he wished his name to be put forward for a professorship. Porter had impressed King with his willingness to step in on several occasions at short notice to give lectures. Bragg told Porter he was ‘delighted to hear’ that he had been sounded out about being an RI professor: ‘you have always been so good in helping us with our lectures here’. In February 1963 the RI’s Managers agreed to King and Bragg’s recommendation that Porter should be appointed Professor of Chemistry, a post that they resolved to create for Porter should one not exist. It was found, however, that such a professorship did indeed exist, the chair having been vacant since the end of the tenure of Edward Frankland (1825–99) in 1868. Porter was nominated at the Annual General Meeting of Members in May 1963 and formally elected on 6 May. Porter’s chair was part-time—consisting of giving a discourse and a few schools lectures each year of a (customary) three-year tenure—which meant he could continue as Firth Professor at Sheffield. From the position of RI professor Porter was able to cement his connection to the institution and take a more active role in RI affairs; he also became better acquainted with Bragg and some of the Managers—Hopthrow in particular.

In Hopthrow’s diary account of his late 1963 discussions with Bragg on the question of a successor he added—in parentheses—after the mention of Porter’s name a revealing piece of information: ‘After a brilliant discourse on [the] 2nd law of thermodynamics a number of Managers spoke to me strongly in his [Porter’s] favour.’
The lecture that Hopthrow referred to was a FED, ‘The law of disorder’, delivered by Porter on 31 January 1964. Given the context it seems Hopthrow believed that this ‘brilliant’ lecture had influenced some Managers to consider Porter a strong contender to succeed Bragg. I would guess, for reasons that will become clear in the final section of this article, that the Managers who had spoken to Hopthrow included Schall, Davies, Jolley and Jordan—the group identified in the previous section. The fact that Hopthrow chose to highlight this one particular lecture to explain how Porter became a frontrunner in the search for Bragg’s successor (and privately the first choice of the Secretary and Treasurer) points to its significance. But why did Porter’s lecture, on the subject of the Second Law of Thermodynamics, make such an impression?

SNOW AND THE SECOND LAW

In the late 1950s and early 1960s the laws of thermodynamics—the second in particular—had become somewhat of a hot topic in conversations about education and culture. C. P. Snow was responsible for this. In his 1956 *New Statesman* article ‘The two cultures’ Snow first put forward his famous thesis describing a perceived gulf between scientific and literary cultures. In this piece Snow claimed that ‘not to have read *War and Peace* and *La Cousine Bette* and *La Chartreuse de Parme* is not to be educated; but so is not to have a glimmer of the Second Law of Thermodynamics’. Writing in the wake of the Suez crisis, Snow revisited his ‘two cultures’ thesis in a two-part article for The Sunday Times in 1957, this time accompanied with a declinist and technocratic battle-cry bemoaning the ‘breakdown in communication’ between scientists and the ‘Managers (administrators, journalists, and so on)’ of society. He revealed that he had ‘once asked a group of highly intelligent and cultivated people if they had any idea ... what conservation of energy means. ... They hadn’t’ and so, according to Snow, they could not begin to understand anything about modern physics. Snow was referring to the First Law of Thermodynamics, but two years later in his Rede Lecture and subsequent best-selling book *The two cultures and the scientific revolution* he returned to the Second Law as his test question of scientific literacy:

> A good many times I have been present at gatherings of people who, by the standards of the traditional culture, are thought highly educated and who have with considerable gusto been expressing their incredulity at the illiteracy of scientists. Once or twice I have been provoked and have asked the company how many of them could describe the Second Law of Thermodynamics. The response was cold: it was also negative. Yet I was asking something which is about the scientific equivalent of: Have you read a work of Shakespeare’s?  

This now famous and oft-quoted passage caused quite a stir in the following years. Although Snow’s talk of illiteracy had been in reference to the narrow academic world of ‘literary intellectuals’ and ‘physical scientists’, he generalized to speak of the ‘intellectual life of the whole of Western society’; as had been explicit in his 1956 article, the implication was that the Second Law should be required knowledge for any cultivated or educated individual, part of a ‘common culture’. Some took Snow’s words quite seriously. The New York Times, for instance, felt compelled to conduct a survey and quizzed ‘10 noted humanists’ on their familiarity with the Second Law, finding that out
of ‘four historians, three philosophers, and three specialists in literature . . . six did and four did not know the law’. 35 More serious still in tone, the Yale philosopher Brand Blanshard (1892–1987) contributed in the same publication a three-page piece with the lofty title ‘Hamlet vs. the laws of thermodynamics’ that earnestly engaged with the question of which had more educational value: Shakespeare’s plays or the Second Law. 36

In his infamous 1962 critique of Snow’s Rede Lecture, the Cambridge literary scholar Frank Raymond Leavis (1895–1978) dismissed Snow’s comparison altogether as ‘meaningless’, insisting that the two things were incommensurable. 37 Among the backlash of responses provoked by Leavis’s Richmond Lecture in the weeks after its publication in The Spectator, several of Snow’s supporters specifically refuted Leavis’s point that scientific and literary ideas could not be compared—the literary critic Martin Burgess Green (1927–2010) went as far as saying that the experience of first knowing the Second Law, ‘a most vivid, even melodramatic, concept, . . . is very similar to having once read Macbeth’. 38 The science writer and former physicist John Maddox (1925–2009), 39 in contrast, joined with Leavis in criticizing the wisdom of Snow’s test question, deeming it an example of one of the lecture’s hollow catchphrases. Maddox remarked that the frequent lament (not always by Snow, he pointed out) that ‘arts graduates do not understand the Second Law’ has been ‘embarrassing to Snow’s supporters among the professional scientists, for not all of these can justly claim the kind of delicate understanding . . . necessary to satisfy an examiner’. Maddox also doubted, rather sensibly, whether ‘society would be very much better off if people at large had a feeling for the Second Law’, arguing it is ‘perhaps the least urgent’ bit of scientific knowledge to inform ‘intellectual activity’. 40

Snow’s test question also provoked a mocking, irreverent response. The Oxford-educated journalist James Morris (b. 1926; became Jan Morris in 1972) lampooned Snow’s ‘two cultures’ diagnosis in an amusing 1961 piece for The Guardian in which he described his visit to the Atomic Energy Research Establishment at Harwell, near Oxford:

Whenever I drive past Harwell I ask myself a brutal question. ‘What is,’ I inquire into the driving mirror, looking myself accusingly in the eyes, ‘the Second Law of Thermodynamics?’ . . . What in heaven’s name, I repeat, is the Second Law of Thermodynamics? What, for that matter, is Boyle’s Law? Or Hess’s Law? Or Kohlrausch’s Law? . . . Swift and dark these snorters succeed each other, and coldly indeed does Harwell look back at me. 41

It was of course the supposedly scientific culture of Harwell that Snow had contrasted with the literary culture of Hampstead. 42 Malcolm Muggeridge (1903–90) was another who took a swipe in his satirical piece on modern Britain for the special issue of Encounter, ‘Suicide of a nation?’: ‘Give us this day our Daily Express, each week our Dimbleby. God is mathematics, crieth our preacher. In the name of Algebra, the Son, Trigonometry, the Father, and Thermodynamics, the Holy Ghost, amen.’ 43

Such was the cultural currency of Snow and the laws of thermodynamics that they even became the target of the popular comedy duo Michael Flanders (1922–75) and Donald Swann (1923–94). On 2 October 1963, at the premiere of Flanders and Swann’s musical revue At the drop of another hat, the audience of London’s Haymarket Theatre were informed by the ‘luxuriously bearded’ Flanders (as The Times reviewer described him):

One of the great problems in the world today is undoubtedly this problem of not being able to talk to scientists . . . I think it was C. P. Snow [who] first raised it—Sir Charles Snow in private life—in his books Science and Government, and so on. Mind you, I haven’t read it. I’m waiting for the play to come. He says, quite rightly, it’s no good going up to a
scientist and saying to him... ‘good morning, how are you, lend me a quid’ and so on. ...
No, you have to speak to him in language that he’ll understand... something like, ‘Ah, H₂SO₄ Professor! Don’t synthesize anything I wouldn’t synthesize. Oh, and the reciprocal of pi to your good wife.’... Snow says that nobody can consider themselves educated who doesn’t know at least the basic language of science. .... The Second Law of Thermodynamics, this is very important. I wasn’t so much shocked the other day to discover that my partner not only doesn’t know the Second Law, he doesn’t even know the First Law of Thermodynamics!

After Flanders’s monologue ridiculing Snow’s call for greater scientific literacy there followed a song that cheerily explained the First and Second Law of Thermodynamics, with the catchy refrain: ‘Heat won’t pass from a cooler to a hotter/You can try it if you like but you’d far better not-a.’ Snow, however, would soon change his mind about the Second Law being required knowledge in a common culture.

SNOW’S CHANGE OF TEST QUESTION

In March 1963 Lawrence Bragg invited Snow to give a FED at the RI. Bragg had followed Snow’s ‘two cultures’ writings from the beginning, keeping press clippings and publishing in The Sunday Times an enthusiastic appraisal of Snow’s 1957 ‘Britain’s two cultures’ article. Indeed, according to Bragg’s daughters, the phrase ‘two cultures’ came into existence during a conversation that Bragg and Snow shared while on a train to London. Bragg had long been concerned with the issues raised by Snow regarding the teaching of science to non-scientists, the need for broad education and the fostering of a common culture. While he was director of the Cavendish Laboratory at Cambridge in the 1940s and early 1950s Bragg organized humanities courses for science undergraduates and was also on the committee for the founding of Cambridge’s Department of the History and Philosophy of Science—a discipline that from the 1960s was often characterized as bridging the gap between the two cultures.

Snow and Bragg settled on 29 November 1963 as a date for the FED. As for the lecture’s subject, Bragg presumed that Snow had ‘plenty of material about the various things [he had] been interested [in] lately’ and told him that ‘there is no need for this material to be new’. However, Snow, who had yet to publically respond to Leavis, was not forthcoming with ideas. After ignoring two requests from Bragg to provide a title and abstract he finally replied in late July to say he had found it ‘very difficult to find a suitable subject’ and, because Bragg knew the ‘things he was interested in’, asked him whether he ‘could make one or two suggestions’. At the bottom of Snow’s letter written in pen are presumably Bragg’s ideas:

The role of the scientist in administration
Future place of scientist
The educated man in modern times
Science and personality.

A couple of weeks later Snow’s secretary sent through the title ‘The Sorcerer’s Apprentice and the Two Cultures’ and an abstract that read:
The importance of picking Porter

This is an afterthought by the Sorcerer’s Apprentice himself, and consists of reflections on how he thought modest and practical educational proposals became a jumping off point for a violent debate all over the world. Why did this happen? What is the position now?  

For his FED, then, Snow was planning to re-enter the ‘two cultures’ debate, which he made clear in the above abstract was to be understood in terms of educational proposals—possibly in line with Bragg’s suggested topic of the ‘educated man’. Education—particularly scientific and technical education—was a very live issue at this time. The Robbins Committee on Higher Education (1961–63) would publish its report in the following month, recommending a huge expansion of enrolments and facilities with an emphasis on investment in science and technology.  

With reference to the ‘violent’ debate his lecture had aroused, Snow’s abstract also hinted that he might address Leavis for the first time. All of this attracted the interest of Philip Daly (1924–87), a senior science producer in the BBC’s Outside Broadcast department, who contacted Bragg in October about televising the discourse.  

Surprisingly, Hopkins seems to have been privy to Snow’s latest plans, as it was he who informed Bragg of Snow’s forthcoming *Times Literary Supplement* article ‘The Two Cultures: a second look’.  

Published on 25 October 1963, Snow’s article served as a template for his discourse. His key message was that education was the ‘chief means open to us’ for solving the problem of the two cultures. He also addressed the criticism that his Rede Lecture had received—briefly alluding to Leavis without actually naming him—the rare instance of ‘personal abuse’ and ‘defamation’ it had attracted.  

Discussing the shortcomings of the lecture, Snow admitted he had shown ‘bad judgement’ in one particular passage in which he ‘regretted’ he had used as his test question of scientific literacy the Second Law of Thermodynamics. Although he believed it a ‘good question’ and that the law has great ‘depth’, ‘generality’ and ‘sombre beauty’, it hadn’t occurred to him that the ‘law is called by what to most people is an unfamiliar, and therefore funny, name’. Flanders and Swann’s humorous send-up of the Second Law may well have been on his mind. So instead Snow put forward molecular biology in general, ‘from the analysis of crystal structure’ to DNA, as an area of ‘self-contained’ knowledge that ‘ought to be requisite in the common culture’.  

Bragg probably influenced Snow’s change of test question. A few months earlier Snow had listened with much interest to Bragg’s personal stories of molecular biology during an evening spent with him at the RI. ‘What you told me about the history of the protein structures’, Snow afterwards remarked, ‘was quite fascinating.’ Bragg, of course, had been a key figure in the DNA story and the development of molecular biology in Britain. It was the X-ray crystallographic methods developed by him and his father, William Henry Bragg (1862–1942), that were used to determine the structure of DNA, as well as many other molecules. It was also under Bragg’s direction at Cambridge’s Cavendish Laboratory that Francis Crick (1916–2004) and James Watson (1928– ) performed their famous work. The 1962 Nobel prizes in Physiology or Medicine and Chemistry—which respectively went to Crick, Watson and Maurice Wilkins (1916–2004) for their DNA work, and to Max Perutz (1914–2002) and John Kendrew (both of whom had been in Bragg’s RI research group) for determining the structure of globular proteins—raised the public profile of molecular biology in Britain.  

As an instrumental figure in the work of both Nobel awards, Bragg contributed to a BBC television programme on the 1962 laureates, *The prizewinners*, which was produced by Philip Daly and watched by almost five million UK viewers on 11 December 1962.
Bragg took an active interest in the reception of Snow’s new test question. When an editorial leader in *The Times* expressed (not entirely serious) regret at Snow’s withdrawal of the Second Law as a test question, Bragg penned a lengthy defence of its perceived replacement—DNA—published in the paper the following week. Introducing his piece, Bragg gave his position as ‘scientific director of an institution whose main aim for over 160 years has been to form a bridge between the “Two Cultures”’ as his qualification to speak on ‘the difficulties of communication between the arts and sciences’. In a later article Bragg revealed his opinion of Snow’s original choice of test question: ‘personally I think it was rather hard on the layman . . . Snow himself now feels it was rather a tall order’.

As had been expected, Snow’s discourse was extremely popular: 575 crammed into the RI’s lecture theatre, exceeding the legal capacity of 440 and almost doubling the average attendance (300) at discourses for that year. According to Snow’s brother and biographer Philip Snow (1915–2012), ‘Charles found his ‘modest’ lecture being talked about wherever he went. Abuse was mixed with praise.’ It was certainly the former that characterized one review in *The Times* of the lecture’s abridged broadcast, televised the following February: ‘35 minutes of his solid expression and (frequently) the top of his head, was often a distracting image’, complained the disgruntled reviewer.

**PORTER’S RESPONSE: ‘THE LAW OF DISORDER’**

After a special FED given by Max Perutz and John Kendrew on ‘The structure of proteins’ in November 1963, which took place a few weeks before Snow’s discourse, the BBC’s Philip Daly caught up with George Porter and his wife Stella at the RI. Daly was an RI member and also sat on the Lectures Committee with Porter. He had previously worked with Porter in 1959 on an episode of the BBC’s science series *Eye on research*, which was Porter’s first television experience. After the discourse, Daly wrote to Porter:

> I have been turning over in my mind the points you raised on the Second Law of Thermodynamics. It seems to me that this might make a very good piece for our new science programme *Horizon*, perhaps approached from the point of C. P. Snow rejecting it in favour of DNA. In his recent article in ‘The Times Literary Supplement’, Snow argued that the Arts graduate cannot appreciate the spirit of science without understanding the philosophy behind the Second Law . . . it would be this argument that I would consider suitable for *Horizon* rather than the didactic explanation of what the Second Law states.

Daly was the first editor of *Horizon*. Still in its development stage at this point, *Horizon* arose out of a 1961–62 review of science programming in which the BBC decided to discontinue *Eye on research*. As its successor, *Horizon* would deal ‘with scientific topics which have philosophical impact on other fields of the arts and humanities’. Porter had told Daly about some of the interesting questions he had received on the Second Law from sixth-formers during his Schools Lectures course earlier in the year. According to his notes, Porter introduced the Second Law to his students by way of discussing the ‘two cultures’. In the weeks that followed, Daly and Porter corresponded about the idea of a *Horizon* programme on the Second Law. Daly was keen to stress that the potential programme would avoid didacticism, one of the policy aims of *Horizon*, although Porter thought ‘some sort of exposition of the law itself’ essential because ‘practically all non-scientists
and a large number of scientists as well’ do not know what it is. He also reminded Daly of his desire to do a whole series on chemical change, but admitted that it lacked the ‘glamour of relativity or molecular or human biology’. In December Daly and Porter met again over drinks at Brown’s Hotel—opposite the RI. Daly agreed that they should not assume the audience to be familiar with the Second Law but he wanted to get away from the kind of ‘flat statement’ found in a reference book and instead explore ‘why, in C. P. Snow’s words, “it evokes reverence and has its own sombre beauty”’. In the following month, Porter met two other BBC producers, Alan Sleath and James McCloy, at Brown’s. By this point the Second Law had been dropped as a Horizon idea in favour of Porter’s writing and presenting his own 10-part series on thermodynamics (figure 2). On 31 January Sleath was among the audience for Porter’s FED ‘The law of disorder’.

‘In discussions about the two cultures’, Porter began his discourse, ‘which have occurred rather frequently of late, the Second Law of Thermodynamics is often mentioned as a sine qua non of scientific enlightenment in the same way as the works of Shakespeare or Beethoven might represent the arts.’ Porter addressed the cultural debate about the Second Law from the same angle as he and Daly had discussed. He continued by stating that the place of the law in ‘common culture’ was ‘less secure’ than Shakespeare or Beethoven. ‘Thus’, providing his mildly mischievous evidence, ‘the Warden of Wadham and past Vice-Chancellor of Oxford University says of thermodynamics, “Well, I don’t even know what it is!”’ and one detects a note of satisfaction in the pronouncement. Porter then remarked that even Sir Charles Snow had recently withdrawn this as his test question of scientific literacy, quoting the passage of Snow’s Times Literary Supplement article in which he explained that the Second Law, despite its beauty and universality, required learning some of the ‘language of physics’ to understand it. Although agreeing with Snow, Porter pointed out: ‘it is also true that to interpret Beethoven fully requires a long musical training’. The ‘real question’, which Porter presumably hoped the rest of his lecture would answer to the positive, ‘is whether one can derive intellectual satisfaction from … the second law without long and specialised study’.
As well as lucidly explaining a topic that had, thanks to Snow, gained an air of esoteric mystique in public debate, Porter’s lecture cleverly tapped into Snow’s enormously influential and monopolizing ‘two cultures’ framework. As Guy Ortolano has shown, under the rubric of the ‘two cultures’, discussions were confined not only to the subject of ‘the arts and sciences and education but also British history, national decline, the Cold War, non-Western economies—and... pretty much anything else’. Opinions on the thesis itself varied wildly, from those that enthusiastically praised Snow for ‘beautifully expos[ing] the basic crisis of our existence’ to criticism that challenged his every premise, as well as his proposals. Nevertheless, the pervasiveness of Snow’s ‘two cultures’ was profound. It influenced the highest levels of policy formation—notably the Robbins Report, and also the example of Snow himself, who, despite having no previous experience in political office, was invited in 1964 to serve as Parliamentary Secretary in Harold Wilson’s novel (and short-lived) Ministry of Technology. It was invoked across both sides of the Atlantic by the upper echelons of university administration to justify the need to establish History of Science departments. Even the Managers of the RI could not escape Snow’s omnipresent thesis.

SCHALL’S VISION AND THE CIVIL SERVICE LECTURES

In Schall’s aforementioned letter to Hopthrow (dated 1 September 1964), in which Porter was revealed to have been their ‘first choice’ to succeed Bragg, Schall went on to discuss ‘our ideas’ (presumably his and Hopthrow’s) on the direction that the next scientific director might take:

You have, I think, seen a document by Greenaway on the point. It is a bit woolly but after reading it twice I believe he has got a germ of an idea. It is that the RI should in the fourth quarter of this century be the forum where C. P. Snow’s two cultures are brought together.

Frank Greenaway (1917–2013) was at the time the RI’s Chairman of Visitors and Deputy Keeper in the Department of Chemistry at the Science Museum. The document that Schall alluded to was a memorandum written by Greenaway in December 1963 (a month after Snow’s FED) for the RI’s Development Committee. The memorandum addressed what Greenaway considered to be ‘a world problem which the next generation must attack and solve’, namely the ‘abolition of the distinction between scientist and non-scientist at the highest levels of government, education and industrial administration’. Along these Snow-inspired lines, he envisioned the RI making a three-pronged attack in its future role. First, to unite the scientist and administrator, he proposed lecture courses and colloquia (‘only very senior people would be invited to the latter’). Second, to correct prejudices and bridge understanding between scientists and non-scientists, he proposed the establishment of a Professorship in the History of Science and the election of social scientists as Managers and Visitors (‘we neglect the study of the social relations of science and technology at our peril’). Third, and finally, he proposed the establishment of a ‘programme of research on research’ to study the methods by which the material world is investigated.

Referring to Greenaway’s first proposal, Schall remarked to Hopthrow how he thought it curious that both Greenaway and Bragg struck upon the idea of establishing a course of RI civil service lectures at the same time. The idea of providing scientific education for the civil service, however, was not a novel one. It had been one of C. P. Snow’s key dogmas—to foster a greater scientific literacy within the civil service and government, and to
encourage more scientists to enter Westminster and Whitehall. From 1945 to 1960 Snow had himself been a civil service commissioner, the first one responsible for recruiting scientists and engineers. Snow’s technocratic critique of the civil service could be read in much of the declinist literature of the time, such as Anthony Sampson’s *Anatomy of Britain* (1962) and the *Encounter* special issue ‘Suicide of a nation’? The idea for the RI’s civil service lecturers did not in fact come from within; it was Jack H. T. Goldsmith (1903–87), a civil service commissioner, who approached Bragg in November 1963 about the possibility of the RI’s providing scientific training for new recruits. Interestingly, Goldsmith had got the idea while reading Bragg’s letter in *The Times* that defended Snow’s new test question. Later that month, to come full circle, Bragg consulted Snow about the scheme.

Bragg enlisted the help of Richard John Harrison (1920–99), the RI’s Fullerian Professor of Physiology and Comparative Anatomy (1961–67), and Porter, the RI’s Professor of Chemistry, to devise and deliver the biology and chemistry strands, respectively, of the civil service lectures. From the beginning, Porter told Bragg he was ‘very interested’ and ‘happy’ with the scheme and took an active role in the planning of the programme. When it was announced to the press in May 1964, *The Times* chose a predictable headline: ‘Bringing together “Two Cultures”’. The first course of civil service lectures at the RI began in October 1964.

The Managers regarded the civil service lectures with much importance, several of them citing the proposed scheme in August 1964 as the primary reason why they thought Bragg should continue beyond his retirement age of 75 years. Corresponding over the summer of 1964, Schall and Hopthrow were both concerned that Bragg’s (and later Ronald King’s) health and heavy workload might risk the breakdown of the venture, which Schall stated would be ‘rather disastrous’ to the RI. ‘If it were not for the Civil Service programme’, Schall told Hopthrow, ‘I would have said the appointment [of Bragg] should come to an end next May [1965] ... But the Civil Service undertaking is so entirely his [Bragg’s] baby and is such a feather in his cap and in that of the RI ... that I feel that he should go on for at least till 1966 and perhaps 1967’. At the conclusion of his ‘two cultures’ vision in the September letter to Hopthrow, Schall stressed yet again that the ‘Civil Service Lectures just must not be a failure ... in the interests of the future of the RI, they must be a success’.

Porter’s involvement in the civil service lectures, a scheme that the Managers viewed as crucial to the future of the RI, must have further consolidated his position as a potential successor to Bragg. Indeed, as we shall see, it would later be cited as an important factor in his favour at the conclusion of the formal selection process. Addressing Schall’s discussion of the future plans of the RI, Hopthrow told Schall that he thought it best to get the ideas of the incoming scientific director first and then bring up the Greenaway memorandum when ‘pertinent’. Nevertheless, both Schall and Hopthrow had already seen evidence that Porter was engaged with the ‘two cultures’ debate as demonstrated in his ‘Law of disorder’ FED and, through his involvement in the civil service lectures, that he was interested in uniting the scientist with the administrator.

**THE PROCESS OF PICKING PORTER**

At the beginning of September 1964 both Schall and Hopthrow were anxious to settle the matter of the succession as quickly as possible. In his letter to Hopthrow on 1 September Schall outlined the action he thought they should take to secure their first choice:
we should get the approval of Lord Fleck and then approach Porter. We would ask him whether the job attracts him and if so what would be his line of research. After that we would tell him what was in our minds [regarding the future role of the RI]. After that he would think it over and if our proposals appeal to him we would then put them to the Managers in October. . . . If on the other hand he is not attracted to the job then we are right back at the beginning and must think of somebody else.\textsuperscript{95}

Hopthrow replied that he had met with the RI’s President, Alexander Fleck, the week before to discuss the matter. Fleck was trained as a radiochemist. Like Hopthrow he had had a career with ICI, where he had risen up the ranks, becoming Chairman in 1953. He held several governmental, scientific and industry chairmanships in the 1950s and 1960s and was elected President of the British Association in 1958, Treasurer and Vice-President of the Royal Society in 1960, and President of the Royal Institution in 1963.\textsuperscript{96} From their meeting Hopthrow gathered that Fleck had compiled ‘a list of a number of possibles’, which Fleck proposed to discuss at the Special Meeting of Managers in October. Hopthrow told Schall that Fleck did not ‘disclose a single name’ to him but that he ‘would expect Porter to be one of them’, adding that he ‘would be a strong supporter of Porter but not yet to the exclusion of others whose names I do not know’. Schall replied that he was sorry the meeting with Fleck had been ‘a bit of a failure’ (he had expected it to be a matter of simply securing the President’s permission to proceed with their plans to approach Porter), but said he was ‘interested to know whom the President had in the pipeline for the post’.\textsuperscript{97}

In a series of crossed letters during these exchanges, Schall brought another name to Hopthrow’s attention: Sir Harry Melville (1908–2000), Secretary of the Department of Scientific and Industrial Research, whom Schall thought they could treat as a ‘very strong second string’ to Porter. Hopthrow asked whether Melville had ‘a lady suitable for the duties that fall on the Resident Professor’s wife’, adding that it was an ‘essential qualification for any candidate’.\textsuperscript{98} The social duties of the Resident Professor’s wife, such as hosting discourse dinners and entertaining at parties, were considered by the Managers to be integral to the RI’s role as a social club for its members. Schall, who concurred with Hopthrow on the issue, replied that he knew ‘nothing about the lady of my second choice except for what appears in Who’s Who and that is quite scanty’, but that he would ask Manager L. B. W. Jolley to make enquiries.\textsuperscript{99} The question of a candidate’s wife would come up frequently in the selection process.

In early September 1964 Hopthrow received Fleck’s list of suggested names (figure 3). Porter’s name was not in fact included on the original typed list (suggesting that Fleck was unaware of the other Officers’ preference), but was added in pen—probably by Hopthrow, who it seems also inserted a column of the candidates’ ages.\textsuperscript{100} Fleck read his list out at the Special Meeting of Managers on 5 October, attended by eleven Managers, the three Officers, and the Chairman of Visitors, Frank Greenaway. The first question asked was which of the candidates were Fellows of the Royal Society and which were Members of the Royal Institution. The Cambridge chemical engineer Peter Victor Danckwerts (1916–84), who had ‘not FRS’ written next to his crossed-out name, was presumably eliminated from contention for this reason. Most of the rest of the comments were concerned with the age of the successor—‘whether young or mature’.\textsuperscript{101} The four eldest candidates—Edgar Adrian (1889–1977), Patrick Blackett (1897–1974), Mark Oliphant (1901–2000) and Patrick Linstead (1902–66)—were also crossed out. The Managers were not unanimous on what age range
was best, although the Officers favoured a relatively young person. In his correspondence with Hophthrow Schall deemed Porter’s age of ‘only 44’ a qualification in itself.\textsuperscript{102}

Kathleen Lonsdale (1903–71) was the only female candidate. Her presence on the list was probably due to her connection to the RI—both as a crystallography researcher in

Figure 3. Lord Fleck’s list of ‘possibles’ to succeed Lawrence Bragg. (RI MS AD O3/C/21/5; reproduced courtesy of Royal Institution archives.) (Online version in colour.)
William Henry Bragg’s research group and as an RI Manager and Vice-President between 1961 and 1963. As a candidate she was never discussed or considered; the language used to describe the desired profile of Bragg’s successor (such as ‘are we able to give suitable facilities for a young man’) suggests that the Managers assumed that the gender of the appointment would be male.103

During the meeting several Managers made their support known for Porter, namely Jolley, Schall and Davies, the last of these stating ‘if Porter would come get him’. Jolley and Davies both suggested sounding out Porter and it was agreed that the Officers were free to do so with any of the names on the list.104 It should be remembered that these Managers were those three of the long-serving four who had survived the Andrade Affair and, before the meeting, Schall had corresponded with Jolley and Davies about his and Hopthrow’s preference for Porter. The day after the meeting Hopthrow agreed with Fleck that he would approach two of the candidates whom he knew ‘personally’ and gauge their interest for the role.105 They were RI professors R. J. Harrison and Porter, both of whom were involved in the civil service lectures.

Harrison, who held the Chair of Anatomy at the London Hospital medical college (1951–68),106 met Hopthrow on 8 October. He expressed several doubts about the RI post, chiefly financial, because his salary at the hospital ‘is probably about double the salary’ of Bragg’s current one, but also the social duties that would be expected of his wife. Although honoured, Harrison withdrew from consideration the next day. In contrast, when Hopthrow met Porter on 22 October at the RI to ask him whether he would like ‘his name to go forward’, he responded

straight away that he needed no time, he would dearly like the post (even to the extent of financial sacrifice) as he had had an intense feeling for RI since boyhood. He would like to leave Sheffield soon in any event & his wife for family reasons wished to live in or near London.107

Given Porter’s reaction, it seems very likely that he had anticipated being asked about the role. Earlier in March Hopthrow had invited Porter and Harrison, in their capacities as RI professors, to comment on the future of research at the RI—possibly to gauge each of the men’s suitability as a potential successor to Bragg. Harrison, in his rather brief response, indicated that he would like the RI to extend its research activities into the field of biology. Porter’s lengthy memorandum argued for the importance of the continuation of research, both for attracting an ‘active scientist’ to the post of ‘director’ and for its role in teaching and lecture demonstration. Porter believed that ‘some aspect of the physicochemical sciences’ would be most appropriate: first, for ‘historical reasons’, alluding to the ‘inspiration of Davy, Faraday, the Braggs’, and second, for ‘teaching and exposition’, arguing that it was ‘easier for someone whose interests lie near the centre of the fundamental sciences than for an astronomer, an organic chemist, a nuclear physicist, a biologist, a social scientist’.108 Porter, a physical chemist, must have recognized this as an opportunity to showcase his own suitability as Bragg’s successor. Indeed, Jolley cited Porter’s memorandum in his favour at the October meeting.109

On 22 October, the same day that Hopthrow met Porter, Fleck received advice from Sir Graham Sutton (1903–97), Director-General of the Meteorological Office and former RI Christmas lecturer. Sutton suggested that someone in the field of molecular biology would be ‘most attractive and in a sense a continuation of tradition’. He considered Kendrew ‘the ideal man in every sense’. Sutton put forward the name of the geophysicist Keith...
Runcorn (1922–95), only to withdraw it immediately: ‘for your purpose he has, I fear, one serious handicap. He is unmarried and I have heard no suggestions as yet of his changing state.’ It is interesting to consider whether the necessity for a scientific director to be married was apparent to outsiders such as Sutton, or whether the President had already made this requirement known to him. Sutton also said that environmental science was another ‘field of growing importance’ and that the best name he could think of would still be Basil John Mason (1926–), Professor of Cloud Physics at Imperial College, London (in the following year he succeeded Sutton as Director-General of the Metrological Office). Fleck was keen on Mason as a candidate, describing him to an RI Manager as ‘very nearly ... a “spellbinder”’ in his lecturing ability.

By the time of the next Special Meeting of Managers on 2 November 1964, Fleck’s list of possibles had nearly doubled. The Visitors had been asked to submit their suggestions, and they certainly did not shy away from the task. Asserting that they thought ‘a departure from tradition worth considering’, the Visitors, through Greenaway, put forward names (and lengthy justifications) from fields as diverse as mathematics, psychology, engineering, nuclear physics and the history of science. Unsurprisingly, it had been Greenaway who nominated the historian of science Derek J. de Solla Price (1922–83) as his candidate. Some way through the November meeting Bragg arrived to give his opinion. First he spoke in general about some of the personal and administrative aspects of the role, and then he dealt with names. From Hopthrow’s minute notes and diary it seems that Medawar, Porter and John Ashworth Ratcliffe (1902–87) were the only names that Bragg singled out for comment:

Medawar (49) is a glamorous figure & if we want him we must ask him as he might be attracted to the glamour of the RI. He could easily command the money for his research.

Porter Right spirit, deeply interested, great teacher. But he is young (44) & would be here a long time. RI may not regret it but having any man for a long time is a risk.

Ratcliffe (62) to some extent he would be a stop gap. Retires as a civil servant at 65. Good organiser and teacher. Encourages young men. Competent and adequate to run the RI.

A few days before the meeting Fleck had visited Medawar, although admitted he had not broached the matter with him in a ‘direct way’ (as Hopthrow had with Harrison and Porter). Nevertheless, Fleck gleaned that Medawar was ‘not interested but [the] door [was] not closed’, adding that he ‘has a very clear idea of [the] RI, particularly its importance and glamour’.

On 5 November, a few days after the meeting, Bragg privately asked Hopthrow why Kendrew’s name had receded, to which Hopthrow replied, ‘largely I believe because he had no wife’. John Kendrew had been the RI’s Reader in Crystallography (1954–68) alongside Max Perutz in Bragg’s research group. He had married Mary Elizabeth Jarvie in 1948 but had divorced in 1956. As the RI occasionally entertained Royal guests, the social stigma that still existed in the 1960s for divorcees might have proved to be a significant stumbling block for Kendrew as a candidate—indeed, divorcees were generally not permitted to enter Buckingham Palace until 1970, when HM Queen Elizabeth II relaxed the rule established by Queen Victoria. Bragg told Hopthrow that he ‘would like time to think about him’. Two days later Bragg came up to Hopthrow’s bedroom ‘before he was up’ and delivered his views on Kendrew:
he would be a worthy successor, good lecturer, Nobel Prize, same line of research, accepted in the ‘Corridors of Power’ (he had been adviser Min. of defence), linguist, excellent broadcaster. All these might overcome the lack of a wife & anyway that situation might be remedied in time.\textsuperscript{117}

Bragg’s mention of Kendrew’s acceptance in the ‘corridors of power’ as a qualification, a phrase coined and popularized by C. P. Snow,\textsuperscript{118} again highlights the technocratic values pervading the search for a successor and the planning for the future of the RI. Kendrew was clearly Bragg’s favoured candidate. Hopthrow asked Bragg to write a memorandum to Fleck about Kendrew.\textsuperscript{119}

Meanwhile, Hopthrow was preparing his shortlist ahead of a meeting of the Officers at the end of the month, to consist of Medawar, Kendrew and Porter. On 26 November Hopthrow, Fleck, Schall and Davies met in the President’s office to discuss the shortlist. Fleck asked the Officers what they thought of Mason, the President’s preferred candidate. The other Officers dismissively replied that ‘none of them knew him’. There then followed a discussion of the relative merits of Medawar, Kendrew and Porter. Again, it was assumed that Medawar was ‘unlikely to accept’. It was also said that, because his work ‘essentially involves experiments on living animals’, Albemarle Street was unlikely to be suitable for housing them and ‘this sort of work might arouse antagonism from some members’. Consideration of the RI’s social function as a club for its members seems to have taken precedence over its role as a research institution.\textsuperscript{120}

A candidate’s specific research interest does not seem to have been a particularly important factor and was rarely mentioned except as an exclusion principle. In fact, Porter had been Schall and Hopthrow’s first choice before they felt it necessary to ‘ask his line of research’, implying that they did not already know.\textsuperscript{121} This is surprising, considering that Porter had by this point achieved considerable scientific standing as a researcher in photochemistry, having published by 1964 some 100 papers in the field. He had been awarded the Corday–Morgan Medal of the Chemical Society in 1955, and had been elected a Fellow of the Royal Society in 1960.\textsuperscript{122} At the November meeting of Officers Porter was described by Fleck as a ‘broad based scientist like [James] Dewar’, a view that seems supported more by his relatively diverse lecture topics than by his research interests.\textsuperscript{123}

Although Porter’s research may not have been well known to the Officers, crucially his lecturing ability and interests in education were. In the meeting Kendrew was said to be a ‘good lecturer, in the flesh and on television, on his own subject. Nothing known of his ability outside it. Nothing known of his interest in education.’\textsuperscript{124} Porter, in contrast, was deemed an ‘excellent lecturer to various types of audiences including children’. Furthermore, although nothing was said about Kendrew’s marital status, the fact that it was stated that Porter ‘had a suitable wife’ was significant.\textsuperscript{125} Stella Porter (née Brooke; 1927–) had met Porter at a dance at the London College of Dance in 1946, and they married three years later. At Cambridge the Porters were highly regarded as hosts for their ‘unstinting hospitality and un-stuffiness’.\textsuperscript{126} That Stella Porter was not only personally known to the Officers but was also deemed ‘suitable’ (and ‘socially competent’ in the final December meeting)\textsuperscript{127} gave Porter a decisive advantage over all other candidates.

From the meeting of Officers Porter emerged as the clear choice—as he had been for Hopthrow, Schall and Davies before the start of the formal selection process; neither Fleck’s support for Mason nor Bragg’s for Kendrew could shake that. Although the decision had effectively already been reached, the Officers ‘agreed that these names in
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alphabetical order should be put to the Managers’ at the Special Meeting on 8 December. The notes from this final meeting reveal that the discussion was focused on comparing the suitability of Porter with that of Kendrew. The lack of knowledge of Kendrew’s interests in education had by this final meeting turned into the definitive judgement of ‘probably no educational experience’, whereas Porter’s ‘ability with children’ was highlighted by Davies. This time it was explicitly pointed out that Kendrew was not married. Bragg asked, ‘how high does P[orter] stand scientifically?’ to which a Manager replied, ‘perhaps not yet Nobel prize level but likely to get senior awards from the Royal Society.’ Tellingly, the last question asked before a decision was reached, from Davies to Bragg, was ‘would Kendrew be interested in Schools and C[ivil] S[ervice] lectures?’ Bragg replied, ‘don’t know—Porter yes.’ The minutes of this meeting simply state: ‘it was agreed that George Porter be invited, subject to the terms to be settled, to succeed Bragg.’

It is hard to see the outcome of the formal selection process, initiated and directed by Fleck, as anything but predetermined. Hopthrow and, to a greater extent, Schall had already settled on Porter before the process began; indeed, the news that Fleck had a list of names with the intention of discussing them before the Managers surprised Schall, who had imagined a straightforward process of electing Porter that effectively involved the Officers only. That Jolley and Davies canvassed for Porter from the first meeting in October to the last in December hints that they may have had an understanding with Schall and Hopthrow to make sure that Porter was picked. The fact that Porter was married (to a ‘socially competent’ wife) served as a powerful rhetorical argument for Porter’s supporters to persuade the board of Managers—who had, generally speaking, strongly held (conservative) ideas about the RI’s function as a social club for its members—that Porter was more suitable than his closest (unmarried) rival, and Bragg’s preferred candidate, Kendrew.

As to why Hopthrow, Schall, Davies, Jolley, Jordan and possibly others privately made Porter their first choice, the key piece of evidence that Hopthrow cited as influencing the Managers in Porter’s favour was the latter’s ‘Law of disorder’ FED. Through this lecture Porter tapped into the public debate about the cultural status of the Second Law and demonstrated to the likes of Schall and Hopthrow his interest in addressing the problems that C. P. Snow’s ‘two cultures’ identified, such as the gap in understanding between scientists and non-scientists, scientific literacy in the administrative classes, and the state of scientific and technical education in Britain. Inspired by a memorandum by the Chairman of Visitors, Frank Greenaway, Schall explicitly envisioned the future direction of the RI as a place to tackle these issues; as a ‘forum where C. P. Snow’s two cultures are brought together’. Porter further demonstrated his suitability in this respect with his involvement in the civil service lectures, a scheme that developed directly, albeit not originally, from Snow’s ideas.

Porter represented a candidate who would continue the work and legacy of Bragg in the area of communicating science to non-scientists and fostering a ‘common culture’; the fact that he would not continue Bragg’s protein research was less important to the Managers. It was these interests in the communication of science that Bragg’s father, William Henry Bragg, had cultivated as part of his RI vision in the 1920s and 1930s. In the memorandum that Porter wrote at the invitation of Hopthrow in March 1964 he emphasized that ‘research and teaching ought to go hand in hand’, (mis)quoting the RI’s historic mission in the ‘Diffusion and Extension of Useful Knowledge’ and alluding to its tradition of discourses, schools and Christmas lectures. During his professorial tenure Porter advertised himself (to what extent deliberately it is uncertain) as a successor with technocratic and Snow-influenced ideals yet one who also understood how continuity with Bragg’s activities and the RI tradition were
essential. As with other institutions in the period,\textsuperscript{137} the RI’s administration were deeply influenced by Snow’s ‘two cultures’ rhetoric, at a moment when decisions of the highest importance needed to be taken about the RI’s future.

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\textbf{NOTES}

1 Managers’ Minutes, RI MS AD/02/B/02/A25, p. 139. When Porter officially took office on 1 September 1966 he assumed the title ‘Director of the Royal Institution’, which had been established by Bragg, after much diplomatic effort, in the previous year as an important step towards reforming the administrative structure. In the period covered by this paper, Bragg’s and his potential successor’s role is sometimes referred to by Managers as ‘scientific director’—a term I occasionally use.


5 Quoted in \textit{ibid.}, p. 299.

6 Ronald King, \textit{op. cit.} (note 2), pp. 135–137.

7 Fleck to the Managers of the RI, 2 July 1964, RI MS AD O3/C/21/5.

8 \textit{Ibid.} Bragg was also anxious to ensure that his RI research group, led by David Chilton Phillips (1924–99), be given time to complete their important work on determining the molecular structure of the lysozyme protein.

9 ‘Sir Lawrence Bragg. Précis of answers received from RI Managers re date of Director’s retirement’, 10 August 1964, RI MS AD O3/C/21/5.


12 Davies was Research Director at Kodak’s UK Laboratories, a position he held from 1931 to 1966. An important figure at the RI, he served as a Vice-President (1961–63) and was variously a member of the Lecture Committee, the Reorganisation Committee and the Development Committee (1962–66).

13 Schall to Hopthrow, 9 August 1964, RI MS AD O3/C/21/5.
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Fleck to Hopthrow (copies to all Managers and Chairman of Visitors), 26 August 1964, RI MS AD O3/C/21/5.

Schall to Hopthrow, 1 September 1964, RI MS AD O3/C/21/5.

H. E. Hopthrow, ‘The succession’, RI MS AD O3/C/21/7, p. 1. It is difficult to tell to what extent Hopthrow’s diary is a personal or an institutional record, although it is hard to find motives for the former. The date on which Hopthrow wrote this entry, 11 October 1964, is worth noting. A week earlier, the Managers had met for the first time formally to discuss candidates. Schall’s mention of Porter as Hopthrow’s first choice in his September letter is a detail omitted from the diary.

17 Ibid.

18 ‘Interview with Professor Sir George Porter’, 1 May 1975, RI MS GP/D4.


21 In 1958 Bragg secured an annual fund of £750 from the Salters’ Institute, the educational charity of the Salters’ Company, to establish lectures in chemistry for schools. Jack Egerton to WLB, 18 January 1958, RI MS AD/03/D/10/19.


23 Bragg to Sucksmith, 9 January 1959; Sucksmith to Bragg, 10 January 1959, RI MS WLB ‘schools lectures’ (uncatalogued).

24 Lawrence Bragg to W. R. Nichols, 19 February 1960, RI MS AD/03/D/10/19.


26 R. S. Nyholm to Lawrence Bragg, 21 March 1961, RI MS AD/03/D/10/21.

27 Ronald King to George Porter, 29 October 1962, RI MS AD/03/E/10; Ronald King to George Porter, 28 March 1963, RI MS GP/A13.

28 Lawrence Bragg to George Porter, 7 March 1963, RI MS AD/03/D/10/25.

29 Managers’ Minutes, 4 February 1963, RI MS AD/02/B/02/A25, p. 38; 4 March 1963, RI MS AD/02/B/02/A25, pp. 47–48.


34 Chronicling the reception of the ‘two cultures’ debate, the historian of science D. Graham Burnett identifies this passage as ‘perhaps the most celebrated passage of the lecture’ in ‘A view from the bridge: the two cultures debate, its legacy, and the history of science’, Daedalus 128 (spring), 193–218 (1999), at p. 196.


36 Brand Blanshard, ‘Hamlet vs. the laws of thermodynamics’, New York Times (24 December), 8, 16, 18 (1961). The article was based on an address by Blanshard at a symposium on ‘Communication between the arts and sciences’ in which Snow also took part at Kenyon College, Ohio, on 27 October 1961.
37 F. R. Leavis, *The two cultures? The significance of C. P. Snow* (ed. Stefan Collini), pp. 73–74 (Cambridge University Press, 2013). ‘The two cultures? The significance of C. P. Snow’ was originally delivered by Leavis in the annual Richmond lecture at Downing College, Cambridge, which he gave on 28 January 1962. It was then published in *The Spectator* on 9 March 1962, before being published in book form by Chatto & Windus in October of that year; the US edition was published in the following year by Pantheon Books.


39 Maddox was later Editor of *Nature* (1966–73 and 1980–95), a Manager of the Royal Institution during Porter’s tenure as Director, and Director of the Nuffield Foundation (1975–79).

40 John Maddox, ‘The significance of C. P. Snow: the two cultures’, *Guardian* (20 March), 6 (1962). Maddox had previously written a lengthy piece explaining the science and history of the Second Law: ‘Second Law of Thermodynamics’, *Guardian* (12 December), 8 (1961). In this earlier article, Maddox was responding to the phenomenon that the Second Law had ‘become a sociological index’ marking out the ‘division of society into two cultures’.


44 ‘This sequel looks set for success’, *The Times* (3 October), 8 (1963); Michael Flanders and Donald Swann, ‘First and Second Law’, *At the drop of another hat* (Parlophone, 1964).

45 Bragg to Snow, 20 March 1963, RI WLB 93S/83; Bragg to H. V. Hodson, 21 March 1957, RI WLB 33B/30.


48 Snow to Bragg, 26 March 1963, RI WLB 93S/84; Bragg to Snow, 28 March 1963, RI WLB 93S/85.

49 For Snow’s reluctance to respond publicly to Leavis and his private tactics in asking allies, such as the historian J. H. Plumb and the crystallographer J. D. Bernal, to defend him in *The Spectator*, see Ortolano, *op. cit.* (note 32), pp. 98–99 and 104.


51 Freda Haddy to Corinne Condon, 6 August 1963, RI WLB 93S/89. Snow explained in a *Times Literary Supplement* piece (‘The two cultures: a second look’, *Times Lit. Suppl.* (25 October), 839–844 (1963)) why he felt like the Sorcerer’s Apprentice: the tempestuous reaction generated by his Rede Lecture had been completely unforeseen, provoked by forces beyond his powers— analogous to the apprentice who had, though his naivety, unleashed magic with consequences he was unable to control.
Higher education: Report of the Committee appointed by the Prime Minister under the Chairmanship of Lord Robbins, 1961–1963 (HMSO, London, 1963). Ortolano (op. cit. (note 32), pp. 78–79) notes that Snow was Harold Macmillan’s first choice for the committee, but Snow, at the height of his fame, declined because of other lecturing engagements in Russia and America. In the first year of the committee, Lionel Robbins informally sought Snow’s guidance, admitting that it was his desire to redress the ‘two cultures’ problem that led him to accept the commission in the first place.

Bragg to Snow, 8 October 1963, RI WLB 93S/96; Daly to Bragg, 17 October 1963, 9 RI WLB 3S/98; Bragg to Daly, 22 October 1963, RI WLB 93S/99.

Snow sought Bragg’s advice on how best he could shape his article into a discourse, and the two met for lunch on 13 November at the RI to discuss this. Snow to WLB, 6 November 1963, RI WLB 93S/101; Bragg to Hopthrow, 7 November 1963, ‘civil service lectures 1963–4’, RI WLB 1436 (uncatalogued).


Ibid., pp. 56–58.

Ibid., pp. 71–72.

Ibid., p. 74.

Snow to Bragg, 26 July 1963, RI MS WLB 93S/88.


BBC Audience Research Department, ‘The prizewinners’, 17 January 1963, BBC WAC T14/1644/1; Daly had asked Bragg to give ‘a very personal piece . . . saying what a tremendous thrill it was . . . to see the day when your own pioneering work has won two more Nobel Prizes for Britain’. Daly to Bragg, 28 November 1962, BBC WAC T14/1645/1.


‘Lectures sub-committee’, RI MS AD/02/B/07/I.

Snow, op. cit. (note 19), p. 147.

‘Characters seen in the round’, The Times (15 February), 5 (1964). RI Discourses are an hour in length.

Daly joined as an RI Member in 1959, with the intention of forging stronger links between the RI and the BBC (Philip Daly to Lawrence Bragg, 30 December 1958; Lawrence Bragg to Philip Daly [copy], 31 December 1958, ‘BBC Television’, RI MS WLB 1753 (uncatalogued)).

Eye on research (1957–61) was a journalistic science programme that made live outside broadcasts of scientists in their laboratories at various research establishments; see Timothy Boon, Films of fact: a history of science in documentary films and television (Wallflower Press, London, 2008), pp. 215–216 and 218–221. Porter featured in the episode ‘Quick as a flash’, which focused on Porter’s photochemistry research group at the University of Sheffield. After the show, Porter and his wife Stella hosted a ‘charming party’ that went down very well with the producers Michael Latham and Philip Daly (Michael Latham to George Porter, 1 June 1959, BBC WAC T14/1498/4).

Daly to Porter, 8 November 1963, BBC Written Archives Centre T14/1610/5.

Timothy Boon, “‘The televising of science is a process of television”: establishing Horizon, 1962–1967”, Br. J. Hist. Sci. 48 (March), 1–16 (2015), at pp. 4–8. Boon shows that definitions of Horizon’s purpose and style were frequently revised and redefined, and did not always accord with practice.

His notes read: ‘Two cultures. Educated man equally familiar with works of Shakespeare and 2nd law of Thermodynamics’. Interestingly, his notes then include lines from the opening scene of
**Macbeth** (act 1, scene 1), which are annotated with chemical demonstrations. ‘Chaos and chemical equilibrium’, undated, RI MS GP/D/299.

Porter to Daly, 3 December 1963, BBC WAC T14/1610/5. As the first commission of a new Adult Education project at the BBC, Hermann Bondi had written and presented in the previous year a 10-part series on ‘\(E=mc^2\): an introduction to relativity’ (hosted by the Royal Institution); as part of the same venture, John Kendrew had a forthcoming 10-part series on molecular biology, ‘Thread of life’—both of which Porter had presumably been briefed about.

Daly to Porter, 9 December 1963, BBC WAC T14/1610/5.

Sleath to Porter, 29 January 1964, BBC WAC T14/2790/1. Porter’s hugely successful series *The laws of disorder*, recorded at the end of 1964 and broadcast in January 1965, belonged to the same BBC Adult Education scheme mentioned above (note 72).

Citations are taken from Porter’s write-up of the discourse in *Proceedings of the Royal Institution of Great Britain*. Porter’s reference to Snow and the ‘two cultures’ was very probably present in the lecture itself, because it featured in all the drafts of the lecture, the FED’s advertised abstract and Porter’s replication of the lecture for the BBC’s *Laws of disorder* series, which was almost identical in content to his *Proceedings* write-up. RI MS GP/D/14; ‘Lecture Before Easter’, RI MS AD/12/E/01/1960s, p. 5.


Schall to Hopthrow, 1 September 1964, RI MS AD O3/C/21/5.

Frank Greenaway, ‘Future development of the Royal Institution’, ‘Other reports’, RI MS AD/02/B/07/G. The subsequent citations in the paragraph are taken from this document.

In the previous year, Greenaway had unsuccessfully applied for the founding chair in the history of science at Imperial College (initially created for the historian of science Derek J. de Solla Price), which Rupert Hall took (James, *op. cit.* (note 47), p. 390), and so probably wished to establish the RI professorship for himself. Greenaway had first submitted a memorandum to the Managers entitled ‘The Royal Institution and the study of the history of science’ in January 1963. The Managers initially agreed to appoint ‘a part-time Professor of HoS for three years, to give discourses and Schools Lectures’. However, after a memorandum by Bragg on the subject, they resolved not to establish a professorship until ‘a suitable candidate is in sight’—undoubtedly, a blow to Greenaway’s ambitions (Managers’ Minutes RI MS AD/02/B/02/A25, pp. 41 and 96). Greenaway did eventually become the RI’s first Reader in History of Science in 1970. It was one of Rupert Hall’s students—Frank James—who in 2004 was appointed the RI’s first Professor of History of Science, having succeeded Greenaway as Reader in 1997.

Greenaway’s idea of a ‘research on research’ echoed Derek J. de Solla Price’s proposed statistical and historical analysis of science in his 1963 book *Little science, big science* (Columbia University Press, New York), in which he asked ‘why should we not turn the tools of science on science itself?’ (p. vii). Greenaway would in fact put forward Price as his preferred candidate to succeed Bragg, recommending him as a ‘historian of science who has
The importance of picking Porter

made a great impression on the way he has brought historical analysis to bear on the condition of modern science’ (Greenaway to Fleck, 26 October 1964, RI MS AD O3/C/21/5).

85 Schall to Hopthrow, 1 September 1964, RI MS AD O3/C/21/5.
87 Bragg to Hopthrow, 7 November 1963, ‘civil service lectures 1963–4’, RI MS WLB 1436 (uncatalogued).
88 Porter to Bragg, 10 April 1964, RI MS GP/C/1316.
89 ‘Civil Servants’ science talks: bringing together “two cultures”, The Times (6 May), 9 (1964).
91 Schall to Hopthrow, 29 July 1964, RI MS AD O3/C/21/5; Hopthrow to Schall, 2 August 1964; RI MS AD/P/01/Q 6.
92 Schall to Hopthrow, 9 August 1964, RI MS AD O3/C/21/5.
93 Schall to Hopthrow, 1 September 1964, RI MS AD O3/C/21/5; Hopthrow to Schall, 2 September 1964, RI MS AD/P/01/Q 6.
96 Schall to Hopthrow, 4 September 1964, RI MS AD O3/C/21/5.
97 Schall to Hopthrow, 2 September 1964, RI MS AD O3/C/21/5; Hopthrow to Schall, 3 September 1964, RI MS AD/P/01/Q 6.
98 Schall to Hopthrow, 2 September 1964, RI MS AD O3/C/21/5.
99 ‘Suggested names’, undated, RI MS AD O3/C/21/5.
100 ‘Special Meeting’, 5 October 1964, RI MS AD O3/C/21/5.
101 ‘Special Meeting’, 5 October 1964, RI MS AD O3/C/21/5.
102 Schall to Hopthrow, 2 September 1964, RI MS AD O3/C/21/5.
103 Ibid. (Emphasis mine.)
104 Ibid.
105 Hopthrow, RI MS AD O3/C/21/7, p. 2.
107 Hopthrow, RI MS AD O3/C/21/7, p. 4.
108 George Porter, ‘Memorandum on the plans for the future of the Royal Institution’, 16 March 1964, RI MS AD/B/07/G.
109 ‘Notes of a Meeting of Officers held in Lord Fleck’s Office’, 26 November 1964, RI MS AD O3/C/21/5.
110 Sutton to Fleck, 22 October 1964, RI MS AD O3/C/21/5.
111 Fleck to Rogers, 22 October 1964, RI MS AD O3/C/21/5.
112 Greenaway to Fleck, 26 October 1964, RI MS AD O3/C/21/5. See note 84.
113 Hopthrow, RI MS AD O3/C/21/7, pp. 5–6.
114 ‘Special Meeting’, 2 November 1964, RI MS AD O3/C/21/5. The choice of the word ‘glamour’ in describing Medawar and the RI is curious, and it is difficult to ascertain exactly what meaning is carried. It seems that the use of the word ‘glamour’ to describe particular sciences (pure, nuclear and space, for example) and scientists had some currency in the 1950s and 1960s. How this association emerged and developed is a question that I hope to address in my doctoral research.
117 Hopthrow, RI MS AD O3/C/217, p. 6. Kendrew won the Nobel Prize for Chemistry in 1962, in the same year as he was appointed the Deputy Chairman of the newly formed Medical Research
Council Laboratory of Molecular Biology in Cambridge. Kendrew was made a part-time scientific advisor to the Ministry of Defence in 1961, having been recommended by that ministry’s chief scientific advisor, the zoologist Solly Zuckerman (who was incidentally another name on Fleck’s extended list). Kendrew’s merits as a broadcaster were based on the 10-part BBC series *The thread of life* (1964), an introduction to molecular biology that he wrote and presented.

‘Corridors of power’ first appeared in Snow’s 1956 novel *Homecomings*, but it was made a household phrase by his 1964 political fiction *Corridors of power*, the story of a Conservative MP’s (failed) attempt to bring about nuclear disarmament in Britain. Snow was writing amid the declining Campaign for Nuclear Disarmament, which he had decided against supporting. It is significant that the fictional politician Roger Quaife was a Conservative, as his eventual fall from parliament reflected Snow’s support for the Labour Party, which he privately advised before its victory in the general election of 1964. C. P. Snow, *Homecomings* (London: Macmillan, 1956), p. 136; see also Ortolano, *op. cit.* (note 32), pp. 33 and 172–175.


Bragg remained in his post until 1966, long enough for David Chilton Phillips of Bragg’s RI group to complete his work on determining the molecular structure of hen egg-white lysozyme, which he did in 1965 and presented at a Royal Society Discussion Meeting held at the Royal Institution on 3 February 1966. (See Phillips, *op. cit.* (note 22), pp. 129–130.) After some initial strong opposition from the Managers, Bragg also succeeded (where Andrade had failed) to establish in 1965 the title of ‘Director of the Royal Institution’, paving the way for Porter to diplomatically reform the RI’s administrative structure.


For example Imperial College, London, and the establishment of History of Science there. See James, *op. cit.* (note 47).