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(DIV0073)

Understanding Underrepresentation in STEM from a Historical Perspective

Key Findings

- The underrepresentation of minority ethnic groups in science, technology, engineering, and mathematics (STEM) today has its roots in the past.
- Contributions from minority ethnic researchers to the development of STEM were often unacknowledged at the time.
- Minority ethnic groups were historically marginalised by the institutions and professions associated with STEM.
- Public-facing historical accounts still present the development of STEM as a history of contributions made primarily by white men.

Key Recommendations

- Acknowledge the historical dimension of the underrepresentation in STEM today.
- Commission research highlighting and celebrating the forgotten contributions of minority ethnic groups to the development of STEM.
- Commission research into the role of particular STEM institutions and professions in marginalising minority ethnic groups.
- Teach a diverse history of STEM as part of the core national school and university curriculum for STEM subjects.

Introduction

The underrepresentation of minority ethnic groups in science, technology, engineering, and mathematics (STEM) today has its roots in the past. In order to understand and address this underrepresentation, it is therefore important to take a historical perspective. In this submission, I focus on the historic and ongoing challenges faced by minority ethnic groups in STEM. In doing so, I present a broad account of the place of minority ethnic groups in the history of science. However, it is crucial to recognise and further investigate the particular histories, and the particular challenges, faced by different minority ethnic groups in STEM. Additionally, it is equally important to consider the role of history in understanding underrepresentation in STEM with respect to gender, disability, and class.

This submission is divided into three core sections. In the first section, I discuss how contributions from minority ethnic researchers to the development of STEM often went unacknowledged. In the second section, I discuss the role of institutions and professions associated with STEM in the marginalisation and exclusion of minority ethnic groups. In the third section, I discuss the ways in which education and the media shape public perceptions of minority ethnic groups in STEM. I then conclude with a series of recommendations, which are summarised at the top of this document. At the broadest level, this submission makes the case for the importance of history in understanding and addressing underrepresentation in STEM today.

1. Forgotten Contributions

The history of modern science is typically presented as a history of the contributions of white European men. This is particularly the case with the history of the 'scientific revolution' of the sixteenth and seventeenth centuries. The story of the scientific revolution is told as one in which a few famous European figures, such as the Polish astronomer Nicolaus Copernicus (1473–1543) and the English mathematician Isaac Newton (1643–1727), made incredible

breakthroughs. A similar story is often told about the later period. In the nineteenth century, the focus tends to be on the British naturalist Charles Darwin (1809–82), and his theory of evolution by natural selection. In the twentieth century, we often hear about Albert Einstein (1879–1955), and his theories of special and general relativity.

As historians of science have shown in recent years, this narrative is inaccurate. The history of modern science is not simply a history of the achievements of white European men. People from minority ethnic backgrounds—both in Britain, and around the world—have consistently made important contributions to the development of modern science, technology, engineering, and mathematics. These contributions were rarely acknowledged at the time, and today often remain forgotten. A few short examples help illustrate the variety of ways in which people from minority ethnic backgrounds contributed to a range of scientific breakthroughs.

Islamic Contributions to Early Modern Astronomy

The Polish astronomer Nicolaus Copernicus is widely acknowledged as the central figure of the scientific revolution. Copernicus's *On the Revolutions of the Heavenly Spheres* (1543) proposed a model of the universe in which the Sun, rather than the Earth, was at the centre. What is less often acknowledged is that Copernicus relied heavily on astronomical and mathematical techniques developed by Muslim scientific thinkers.

Copernicus cited five different Islamic authors in *On the Revolutions of the Heavenly Spheres*, including the Syrian mathematician Thabit ibn Qurra (836–901) and the Iberian astronomer Nur ad-Din al-Bitruji (d.1204). Similarly, the majority of Copernicus's astronomical data was derived from the *Alfonsine Tables* (1252), a collation of earlier observations made by Muslim astronomers. Finally, and most importantly, Copernicus made use of a key mathematical technique first developed by the Persian astronomer, Nasir al-Din

al-Tusi (1201–74). Known as the ‘Tusi couple’, this geometric technique solved the problem of the complex oscillating movement of the planets around the Sun. In fact, *On the Revolutions of the Heavenly Spheres* contains an exact copy of a diagram originally found in al-Tusi’s *Memoir on Astronomy* (1261). In short, without the contributions of countless Muslim mathematicians and astronomers, Copernicus would not have been able to put the Sun at the centre of the universe.

African Contributions to Early Modern Botany

The eighteenth century was a period of significant development in the field of botany. European individuals and institutions amassed vast collections of botanical specimens from around the world, typically in the context of colonial expansion. The history of eighteenth-century botany tends to focus on the achievements of individuals such as the Swedish naturalist Carl Linnaeus (1710–78) and the Anglo-Irish collector Hans Sloane (1660–1753). Linnaeus is famous for having proposed the binomial system of classification, whilst Sloane’s collection formed the basis of the British Museum, and was later incorporated into the Natural History Museum.

However, this focus on European pioneers neglects the important contributions made by people of African descent to the development of eighteenth-century science. Individuals such as Sloane and Linnaeus relied on African botanical knowledge in order to collect, identify, and classify new specimens. This African botanical knowledge was typically acquired in the context of enslavement and violent oppression. Sloane himself benefitted financially from slavery, investing in the Royal African Company and the South Sea Company, whilst receiving one third of the profits of a large sugar plantation on the island of Jamaica. It was during his time in the Caribbean, in the late seventeenth century, that Sloane collected a large number of botanical specimens. In order to collect and identify these

specimens, Sloane relied on the knowledge and expertise of enslaved Africans. Typically, Sloane did not name these individuals in his published accounts. Nonetheless, we know that Sloane's knowledge of the kola nut, including its medicinal qualities, was derived from the knowledge of enslaved Africans. Similarly, Sloane's account of various other plants, including cacao, yams, and black-eyed peas, was also derived from the knowledge of enslaved Africans.

In other cases, we do know the names and life histories of African botanical pioneers. Graman Kwasi (1692–1787) was born in West Africa, in what is today Ghana. As a young boy, he was captured and enslaved, before being transported to the Dutch colony of Surinam in South America. In Surinam, Kwasi developed an expertise in the medicinal properties of local plants, mixing African and South American healing traditions. In particular, he identified a flowering plant which could be used to treat malarial fevers. Carl Linnaeus learned of this discovery, via a Dutch merchant, and named the plant after Kwasi, giving it the binomial name *Quassia amara*. Kwasi is a rare example of an enslaved African botanist who was acknowledged for his expertise at the time. Today, the plant Kwasi identified is still used in medicines, food additives, and pesticides.

South Asian Contributions to Quantum Mechanics

The development of quantum mechanics in the first half of the twentieth century radically changed how scientists understood the atom. The history of quantum mechanics in this period typically focuses on the early work of Albert Einstein, followed by the later developments of Niels Bohr (1885–1962) and Werner Heisenberg (1901–76), amongst other European pioneers. This history neglects the important contributions made by a variety of scientists from minority ethnic backgrounds, particularly those from South Asia.

Satyendra Nath Bose (1894–1974) was born in Dhaka, in what at the time was part of British India, today Bangladesh. He studied physics at Presidency College, Calcutta, and by the 1920s was working as a lecturer at the University of Dhaka. It was during this period that Bose developed an entirely new statistical account of particle physics. In short, Bose realised that recent developments in quantum mechanics meant it was impossible to distinguish one particle from another at the microscopic level. This implied that the existing equations for the distribution of particles were incorrect. Bose developed a new statistical theory to account for this. Following this, Bose met and collaborated with Einstein himself, who described Bose's work as 'an important step forward'. Today, this sub-field of quantum mechanics is known as 'Bose-Einstein statistics'. Particles which follow this statistical pattern are referred to as 'bosons', named after Bose. The Higgs boson, discovered in 2012, is perhaps the most famous example of a boson. Yet today, few people remember that the 'boson' part of the Higgs boson derives from the work of Satyendra Nath Bose.

Chinese Contributions to Nuclear Physics

Many East Asian scientists contributed to the development of nuclear physics during the twentieth century. For a variety of reasons, including the Cold War, and Sinophobia, these contributions often went unacknowledged. This was particularly the case for Chinese scientists. Chien-Shiung Wu (1912–97) was born in Jiangsu province, shortly after the formation of the Republic of China in 1911. She studied mathematics and physics at National Central University in the early 1930s, before travelling to study for a PhD in the United States. Wu completed her PhD at the University of California, Berkeley, in 1940, specialising in nuclear fission. From there, she went on to a successful academic career, becoming the first woman to be appointed at the Department of Physics at Princeton University, and later spending most of her career at Colombia University. Wu also played an important role in the

war effort, working for the Manhattan Project to develop the first atomic bomb in the late 1940s.

Although Wu had a successful career, her story, until recently, has rarely featured in histories of twentieth-century nuclear physics. The history of twentieth-century nuclear physics, and the Manhattan Project in particular, focuses on the contributions of white European and American men, such as Robert Oppenheimer (1904–67) and Enrico Fermi (1901–54). This is despite the fact that the Manhattan Project, and parallel nuclear projects in Britain and elsewhere, relied on many scientists from minority ethnic backgrounds.

Wu's major experimental work was also undervalued for much of the twentieth century. In 1956, Wu conducted an experiment involving beta decay—a type of radioactive process. She was able to show that, during beta decay, a particular variety of physical symmetry, known as parity symmetry, could be broken. This was an incredibly important discovery concerning the nature of fundamental particles. Despite this, Wu's contribution was not fully acknowledged. Instead, the 1957 Nobel Prize was awarded to Tsung-Dao Lee (b.1926) and Chen-Ning Yang (b.1922), two Chinese-American physicists who had done some of the earlier theoretical work, but who had not experimentally proved their results. Wu is therefore an example of how gender, as well as ethnicity, affected the extent to which individual achievements were recognised.

The examples given above give a sense of the variety of ways in which people from minority ethnic backgrounds contributed to the development of STEM. These examples could easily be multiplied. From African astronomers and Mexican geneticists to Japanese physicists and Indian neuroscientists, the history of modern science is a history of these diverse contributions.

Historians of science have started to uncover many of these stories, but more work needs to be done. Research councils (such as the EPSRC, BBSRC, and the AHRC) and professional associations (such as the Royal Society) should enhance this agenda by commissioning further specific research into diverse histories of science. Funding calls should specifically prioritise a more global and diverse approach to the history of science. In terms of public engagement, research councils, universities, and professional bodies should prioritise the recognition and celebration of the contributions of those from minority ethnic groups to STEM. Both research and public engagement should also acknowledge the variety of obstacles and challenges—including racism, colonialism, and slavery—which have led to the exclusion and undervaluing of the contributions of people from minority ethnic backgrounds to the development of modern science. Future research also needs to address how these exclusions intersect with gender and disability.

2. Institutional Legacies

Success in the world of science relies on access to a range of institutions. These institutions include universities, professional bodies, research councils, exam boards, libraries, and museums. Access to these institutions is essential in order to enter the professional world of science, and advance through career stages. Through these institutions, individuals gain access to training, mentorship, funding, professional recognition, and further support. Historically, individuals from minority ethnic backgrounds have been excluded and marginalised by these institutions, particularly elite institutions associated with scientific prestige.

Broadly, the development of the major scientific institutions in Britain was closely connected to the growth of slavery and colonialism. The same institutions which were responsible for scientific training, mentorship, funding, and recognition were also responsible for supporting the enslavement and colonisation of various minority ethnic groups. Prominent

white researchers associated with major British institutions were also responsible for promoting scientific racism, in which those from minority ethnic backgrounds were falsely identified as being less intelligent and so less suited to a career in science. A failure to recognise and fully address these histories at an institutional level helps explain the underrepresentation of minority ethnic groups in STEM today. A few examples will help illustrate this point.

The Royal Society

Founded in 1660, the Royal Society is today Britain's national scientific academy. It is a prestigious honour to be elected as a Fellow of the Royal Society, indicating outstanding scientific achievement. The Royal Society plays an important role in funding scientific research, as well as fulfilling a broader leadership role at the level of policy, mentorship, and scientific publishing.

The Royal Society is also an institution with a long history of involvement in both slavery and colonialism. Shortly following its foundation, the Royal Society invested directly in both the slave trade and colonial trade. In 1682, the Royal Society invested £520 in the Royal African Company and £750 in the East India Company. (Approximately £60,000 and £80,000 in 2022 prices respectively.) Between 1682 and 1700, the stock paid dividends totalling £692 (approximately £79,000 in 2022 prices). At the time, the Royal African Company held a monopoly on English trade with West Africa, principally in enslaved people, whilst the East India Company held a monopoly on English trade with Asia. The Royal Society's investment therefore directly supported both the slave trade and colonial trade. The dividends the Royal Society received were thus a result of profits accrued from slavery and colonialism.

In 1699, the Royal Society sold its shares in the Royal African Company. However, Fellows of the Royal Society continued to profit from both slavery and colonialism. In fact, a significant number of Fellows of the Royal Society were also founding members of the Royal African Company and continued to make private investments. Others occupied prominent positions within the colonial bureaucracy. Robert Boyle (1627–91), famous for developing Boyle's law, was a Director of the East India Company, whilst John Vaughan (1639–1713), who went on to become President of the Royal Society, had earlier served as Governor of Jamaica. Many other Fellows of the Royal Society made private investments in both the slave trade and colonial trade. Isaac Newton, famous for his theory of gravitation, invested in the South Sea Company, which principally traded in enslaved people, as well as the East India Company. At the time of the abolition of slavery within the British Empire in 1833, 46 Fellows of the Royal Society still had a private financial interest in slavery, filing claims valued at over £550,000 (approximately £32 million in 2022 prices) with the Slave Compensation Commission.

Alongside financial investment, the Royal Society played a major role in promoting racist understandings of minority ethnic groups. Throughout the eighteenth and nineteenth centuries, the main journal of the Royal Society, the *Philosophical Transactions*, published multiple articles falsely claiming to identify significant biological and intellectual differences between races. Examples include an article which described experiments conducted on the bodies of enslaved people in British America, as well as an article comparing the size of European and African brains.

Universities

Much like the Royal Society, major British universities profited from the growth of slavery, and colonialism, whilst also promoting scientific racism. Oxford and Cambridge, often

regarded as the most prestigious universities in Britain today, particularly in STEM subjects, are typical in this respect. Tobias Rustat (1608–94), a major investor in the slave trade, later donated £1,000 (approximately £110,000 in 2022 prices) to the University of Cambridge in order to support the foundation of the University Library. Similarly, Christopher Codrington (1668–1710), owner of one of the largest sugar plantations on Barbados, bequeathed £10,000 (approximately £1.1 million in 2022 prices) to All Souls College, Oxford. Other British universities, such as the University of Glasgow, similarly benefited from financial investments or bequests linked to slavery.

Alongside these financial investments, those who studied at elite British universities, particularly Oxford and Cambridge, played a significant role in the colonial bureaucracy. This was especially the case for those who studied science and medicine. John Maynard Keynes (1883–1947), the influential Cambridge economist, began his career working at the India Office. He subsequently published his first book on the management of the colonial economy before being appointed to the Royal Commission on Indian Currency and Finance in 1912. Similarly, Halford Mackinder (1861–1947), who played a key role in establishing the School of Geography at the University of Oxford, worked for the Colonial Office, serving on both the Imperial Economic Committee and the Imperial Shipping Committee.

Senior figures at leading British universities also played a significant role in the development and promotion of scientific racism. The founder of the eugenics movement, Francis Galton (1822–1911), studied mathematics at the University of Cambridge, before going on to establish the Eugenics Record Office, later the Galton Eugenics Laboratory, at University College London. Throughout the twentieth century, eugenicists based at University College London, as well as other British universities, promoted the false idea that different races possessed differential levels of intelligence, further marginalising those from minority ethnic backgrounds from the scientific profession. Other prominent British

eugenicists included the statistician Ronald Fisher (1890–1962), the evolutionary biologist Julian Huxley (1887–1975), and the educational psychologist Cyril Burt (1883–1971).

Research Councils

The organisation of research funding in Britain has changed considerably over the past hundred years. The current organisation, UKRI, which was founded in 2018, is comprised of nine separate research councils. The majority of these were formed in the last three decades, and do not have direct links to colonialism. However, a number of the older research councils do have a longer history of connections to colonialism in the twentieth century. Additionally, some earlier research councils, which were subsequently abolished or absorbed into later institutions, directly supported colonialism and scientific racism.

Of the existing research councils, the oldest is the Medical Research Council (MRC), established in 1913. Over the past hundred years, the MRC has funded ground-breaking research, including work on influenza, the structure of DNA, and monoclonal antibodies. However, during this same period, the MRC also funded research which both relied on and supported British colonial rule. For example, in the 1930s, the MRC worked with the Colonial Office to establish a malaria laboratory in the British Protectorate of Uganda. Similar projects focused on 'tropical medicine' continued throughout the 1940s, with the establishment of a separate Colonial Medical Research Committee. This research was not designed to support the health or promote the careers of colonial subjects, but rather to provide practical solutions to problems of colonial rule, such as endemic disease. Indeed, colonised people were more often test subjects than beneficiaries of this medical research.

In the middle of the twentieth century, as a result of the Colonial Development and Welfare Act of 1940, a number of new research councils were also established with the explicit aim of supporting British colonial rule. These included the Colonial Products

Research Council (est. 1943), the Colonial Social Science Research Council (est. 1944), and the Colonial Research Council (est. 1947). These institutions funded a range of scientific, technological, and medical research in colonial settings. The Colonial Products Research Council, for example, funded work on industrial chemistry in Trinidad, with a view to increasing the economic output of British Caribbean colonies. Similarly, the Colonial Social Science Research Council funded research into 'African psychology', which promoted a racialised approach to intelligence testing. Together, these research councils encouraged an understanding of science in the service of empire.

These examples illustrate the variety of ways in which scientific institutions in Britain have contributed to the marginalisation and exclusion of minority ethnic groups. In order to address the underrepresentation of minority ethnic groups in STEM today, it is necessary to acknowledge and directly address these histories. Further research is needed in order to understand the historic links between particular scientific institutions and the marginalisation of minority ethnic groups from STEM subjects. Whilst historians of science have focused on leading national institutions, such as the Royal Society, more research needs to be conducted in order to understand the histories of different kinds of institutions, such as research councils, universities, exam boards, and discipline-level professional associations. This research should comprise a policy element, identifying how the legacies of these histories could be addressed today. It should also engage relevant stakeholders, particularly those from minority ethnic communities, in order to better understand how this history has affected lives, careers, and attitudes to STEM today.

3. Public Perceptions

Public perceptions of STEM are shaped by two main factors: education and the media. This affects diversity in STEM in a variety of ways. The identities of those associated with leadership, innovation, and excellence in STEM play a significant role in shaping career paths and training. At the same time, the values associated with STEM—particularly the idea that science is value-neutral—shape how different publics engage with science today. Public perceptions are therefore a key component when considering diversity in STEM. What kind of narratives are presented to the public? And what kinds of values are promoted?

The current public narrative concerning science is focused on the achievements of individual white pioneers, typically men. This is coupled to a narrative in which science is presented as value-neutral. As noted in sections one and two, this narrative is historically inaccurate. It also serves to further marginalise those from minority ethnic backgrounds from STEM. The history of modern science is not simply a history of the achievements of white men. Nor is it a history which is straightforwardly value-neutral. Science has been a source of incredible human progress, but it has also been a source of oppression, exploitation, and violence. Publicly recognising the scientific achievements of individuals from minority ethnic backgrounds, as well as the parallel histories of marginalisation and exclusion, is crucial for addressing diversity in STEM today.

Education

The history of science is strikingly absent from national and university curricula, despite the fact that science and technology are widely regarded as central to modern life. In Britain, the overwhelming majority of students studying STEM subjects at both school and university do not study the history of science—they are not given the opportunity. These individuals go on to become the next generation of scientists and policy-makers. Yet they have very little understanding of the historical context of their work. When the history of science is presented

to students, it is far from diverse. For example, a small number of white male scientists are identified by name in the AQA GCSE specifications for Physics, Biology, and Chemistry. These include the Danish physicist Niels Bohr and the British naturalist Charles Darwin. The same is true of A-level specifications. At university, there is no standardised curriculum. Nonetheless, university lectures and teaching materials often contain sporadic references to historical developments in STEM. These invariably focus on the achievements of a few well-known white male pioneers.

All of this reinforces a public perception of scientific leadership, innovation, and excellence as centred on white men. This then has a negative effect on diversity in STEM, as minority ethnic groups are rarely presented with historical role models prior to entering a career in science. This effect is then reinforced at a later career stage, whereby those from minority ethnic backgrounds are less likely to be appointed to leadership positions, in part due to wider public perceptions surrounding which kinds of individuals embody scientific excellence.

Media

Unlike in school and university, the history of science is routinely presented to the public in the media. Newspapers, websites, magazines, popular books, television, and radio programmes all regularly feature content exploring the history of science. However, this content once again focuses almost exclusively on the achievements on white men, reinforcing the inaccurate narrative identified throughout this submission. To give an example: the flagship BBC Radio 4 programme ‘In Our Time’ has aired over 250 episodes listed under the category of ‘Science’. Of these, a number are dedicated to individual white European scientists, such as Robert Boyle, Alan Turing, Marie Curie, and Ernest Rutherford. There are no less than five separate individual episodes dedicated to Charles Darwin. Despite this, there

is not a single episode dedicated to the achievements of an individual scientist from a minority ethnic background. In fact, of the 266 episodes listed on the BBC webpage, only four directly address science outside of Europe: 'Maths in the Early Islamic World' (16 February 2018), 'The Observatory of Jaipur' (19 February 2009) 'Indian Mathematics' (14 December 2006), and 'The Needham Question' (19 October 2006). 'In Our Time' is not unique in this regard. It is simply the most prominent example of a much wider trend, in which the development of science is presented to the public as a history of the achievements of white Europeans. The same is true of major television series and popular books.

On the rare occasion in which the scientific achievements of minority ethnic groups are presented to the public, they are almost always confined to the ancient and medieval period. The scientific achievements of ancient China, for example, does feature in the media. There are popular books on the medieval Islamic 'golden age' of science, whilst 'In Our Time' did dedicate an episode to 'Maths in the Early Islamic World'. Yet the public are presented with very few examples of how Chinese and Muslim thinkers, amongst others, contributed to the development of modern science, particularly from 1500 onwards. This reinforces an outdated narrative, in which the scientific world beyond Europe is seen as less modern, less innovative, and less dynamic.

Values

Both the education system and the media encourage the public to think of science as value-neutral. The links between science and social conflict rarely feature in public accounts of the development of modern science. When this topic is addressed, the public are usually presented with a simplistic—and historically inaccurate—notion that leading scientific figures, such as the Italian mathematician Galileo Galilei (1564–1642), were fighting against the religious superstitions of the time. The public are rarely encouraged to understand the

history of science, particularly in Britain, as a story of slavery, colonialism, racism, and oppression. More often than not, the public are simply told to appreciate the 'wonder' of science. There is very little public recognition of the ways in which minority ethnic groups have been historically marginalised by the very institutions and professions associated with STEM.

It may, of course, seem desirable to present science as value-neutral, particularly at a time when public trust in science is of such importance. This is not a good strategy. The outcome tends to be opposite of that which is intended. The more scientists and politicians insist that science is straightforwardly neutral—that it doesn't have a contested history—the more the public mistrust science. As it stands, there is a disconnect between the reality many individuals experience, particularly minority ethnic groups, and the public narrative. A more open and honest approach, publicly acknowledging the various ways in which STEM has been a source of conflict, marginalisation, and exclusion, would be more conducive to public trust. Such an approach should acknowledge and celebrate the political and social dimension of science. This would help open up the world of STEM to a much more diverse set of individuals—not just those who see a scientific career as value-neutral, but those who also see STEM as a way to change the world in more fundamental ways for the better.

Conclusions

The underrepresentation of minority ethnic groups in STEM today has its roots in the past. In order to address this issue, it is important to begin by acknowledging this historical dimension. In this submission, I have given an overview of three core areas in which history can inform contemporary policy with regards to diversity in STEM. First, the forgotten contributions of minority ethnic groups to modern science. Second, the ways in which institutions and professions associated with STEM have been responsible for the

marginalisation and exclusion of minority ethnic groups. And third, the role of education and the media in shaping public perceptions of diversity in STEM.

This evidence submission focused in particular on diversity in relation to minority ethnic groups. Further work needs to be done in order to expand this, addressing different and overlapping forms of identity, including gender, disability, and class. It is also crucial to recognise and further investigate the particular histories, and the particular challenges, faced by different minority ethnic groups in STEM.

In light of the evidence submitted, I propose four recommendations to the Parliamentary Committee. First, acknowledge the historical dimension of the underrepresentation in STEM today. Second, commission further research highlighting and celebrating the forgotten contributions of minority ethnic groups to the development of STEM.

Third, commission research into the role of particular STEM institutions and professions in marginalising minority ethnic groups. Fourth, teach a diverse history of STEM as part of the core national school and university curriculum for STEM subjects.

In order to implement these recommendations, the Parliamentary Committee will need to work with universities, funding bodies, professional associations, exam boards, and media organisations. The Committee should also draw on the wealth of expertise in the history of science available in Britain. This might include the British Society for the History of Science, as well as specialist university departments with clusters of expertise (such as Cambridge, Oxford, University College London, King's College London, Leeds, Manchester, Warwick, and Edinburgh, amongst others). It is also vital to draw on the experiences, expertise, and memories of minority ethnic researchers themselves.

Before concluding, I would like to offer a few examples of best practice with regards to addressing the history of diversity in STEM. A number of museums have in recent years

placed much greater emphasis on diversity in interpreting and understanding their historical collections. The Natural History Museum, for example, organised a series of events in 2007, and produced an online publication, exploring the connection between museum collections and slavery. Similarly, the Science Museums and Archives Consortium (which includes the Science Museum and the Royal Society) has recently prioritised funding historical research, through its PhD scheme, which addresses 'under-representation, diversity and inclusion across Science, Technology and Medicine collections and their audiences' as well as 'imperial and colonial origins of collections, and addressing the legacies of colonialism'. There have also been a number of recent efforts to collect the testimonies and record the experiences of minority ethnic groups in STEM. These include a series of oral histories, organised by the Royal Society and the British Library, recorded as part of the 'Inspiring Scientists: Diversity in British Science' project. The challenge now is to scale up these individual projects as part of a wider national strategy for understanding and addressing diversity in STEM from a historical perspective.

About the Author

Dr James Poskett is Associate Professor in the History of Science and Technology at the University of Warwick. His research focuses on the global history of science and technology from the early modern period to the present day. Before joining Warwick, Poskett completed a PhD in the History of Science at the University of Cambridge and held the Adrian Research Fellowship at Darwin College, Cambridge. Poskett is the author of *Horizons: A Global History of Science* (Penguin, 2022) and *Materials of the Mind: Phrenology, Race, and the Global History of Science, 1815–1920* (Chicago, 2019). He has written for *Nature* and *BBC History Magazine*, amongst other publications. Poskett is a Fellow of the Royal Historical Society.

Disclaimer

The opinions expressed in this document are solely my own and do not necessarily represent the views or opinions of my employer.

Further Reading

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(January 2022)