

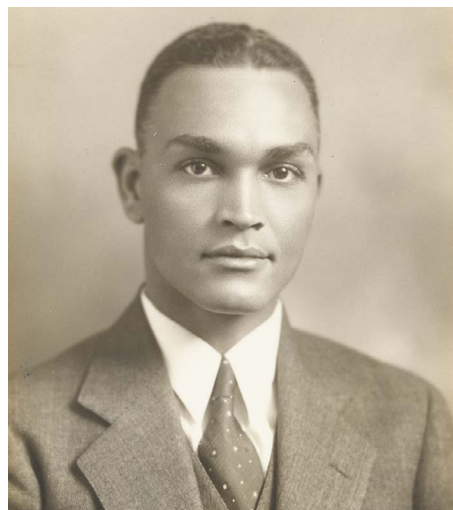
# A Black mathematical history

Documentary reveals how Black US scholars shaped today's mathematics community and provides hope for the future. **By Noelle Sawyer**

**W**hat does a mathematician look like? Standing in front of a room of Black children aged six to twelve, research mathematician Zerotti Woods – who posed the question – is not far off their description. Woods, who is based at Johns Hopkins University in Baltimore, Maryland, is wearing nice trousers, a jacket and even round glasses. Yet he's told he doesn't look like a mathematician. Their unspoken assumption seems to be that mathematicians are white.

In the documentary *Journeys of Black Mathematicians: Forging Resilience*, film maker George Csicsery interviews more than 50 scholars, who speak about the value of mathematics, share parts of their journeys and look to the future. The film, which was co-produced with the Mathematical Sciences Research Institute, premiered in January and has been released online. By juxtaposing career paths with the historical timeline of the civil-rights movement in the United States, the film seeks to show what Black mathematicians have been through and provide hope for what can be. That hope is more than a wish. It is backed up by descriptions of supportive programmes, nurturing educators, positive changes in the community and success stories.

Historical attitudes toward Black mathematicians thread through the film. Scholars such as William Claytor faced blatant discrimination throughout their careers. The US Supreme Court's 1954 integration decision,



William Claytor was discouraged by the racism prevalent in the field.



Virginia Newell is a champion for equality and education.

in which segregated schools were deemed unconstitutional, gave Black students access to white educational spaces. But such access did not necessarily come with better education or treatment. One interviewee notes that the good teachers at Black schools did not follow the children to the desegregated schools. In higher education, Black spaces did not cease to exist. Historically Black colleges and universities (HBCUs) were almost all founded before desegregation, because most pre-existing institutions, particularly in the southern states, either prohibited Black students from attending, or limited their presence through quotas.

## Role models

Teaching and learning at HBCUs is a point of pride throughout the documentary. These are places where Black maths students are nurtured rather than 'othered'. Many interviewees describe how the representation and support they found at these colleges propelled them into the field.

Among those acknowledged as impactful educators are Claude Dansby, who was at Morehouse College in Atlanta, Georgia, from 1922 to 1967, and Etta Falconer, who was mainly at Spelman College, also in Atlanta, between 1965 and 1985. Through interviews with former students and colleagues, Csicsery draws parallels between them and

two mathematicians currently at Morehouse: Duane Cooper and Ulrica Wilson. All are beloved by students and are considered the main reason that some pursued and succeeded in maths. All four had a crucial influence on the paths of dozens of Black mathematicians – which speaks not just to their teaching methods, but more importantly to how they supported their students, and believed in and cared about them. Woods specifically mentions that Cooper taking responsibility for him was the only reason that he was allowed to finish his degree at Morehouse after having been expelled for a year. That care made all the difference.

Many who were interviewed in the film note just how few Black people they met on their maths journey. I've also found this. According to the 2018 US Mathematical and Statistical Sciences Annual Survey, 2.9% of US maths PhDs were awarded to Black mathematicians that year (see [go.nature.com/3tphae6](https://go.nature.com/3tphae6)). Given that around 14% of the US population is Black, this number is incredibly low.

If you're looking for an explanation, the

## Journeys of Black Mathematicians:

### Forging Resilience

Zala Films

Directed by George Csicsery

Digital release 6 January 2024

documentary describes some of the roots of the systemic racism that still permeates maths. The US National Association for Mathematicians (NAM), created in 1969, aims to promote excellence in the mathematical sciences and “the mathematical development of under-represented minorities”. Civil-rights pioneer and former educator at Winston-Salem State University in North Carolina, Virginia Newell, who appears in the film, makes its origins clear: “The reason why we started the NAM was because the whites did not want us at their meetings.” And how could Black mathematicians be welcome when meetings were being held at segregated institutions?

Black people are often still being treated disrespectfully at maths meetings, confirmed a 2021 report by an American Mathematical Society task force (see [go.nature.com/43dhf67](https://go.nature.com/43dhf67)). By organizing a range of events – such as lecture series, sessions at large maths conferences and MATHFest, an annual meeting and networking event for undergraduate students – and by ensuring Black scholars are invited to them, NAM provides, crucially, a community.

### **Aspirations for the future**

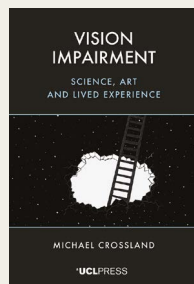
The stories of Black mathematicians shared in the film are inspiring. It is wonderful to learn about successes in academia and industry – but there is still a long way to go. Csicsery makes that clear by titling the final chapter of the film ‘Unfinished business’. The percentage of US maths PhDs earned by Black people has remained mostly unchanged since 1978. “We’ve not moved the needle in producing PhDs,” notes Freeman Hrabowski III, former president of the University of Maryland in Catonsville, who grew up in segregated Alabama.

The question that needs to be asked now is which spaces are worth entering. The film suggests that Black people should be everywhere, so that there are those with similar mindsets and values in every room. But I disagree; there are some rooms that we should not aspire to enter. Not just because they provide a hostile environment – that can eventually be changed. But because some spaces have too high a moral cost. Is it worthwhile to create weapons or work for security agencies, for example, in a push for representation? For me, the answer to that is absolutely not.

Csicsery’s film did not interrogate that idea, but we should. We should sit with the discomfort of the fact that pushing back against the inequities of the past and present should not include contributing to the oppression of others. When watching this worthwhile film, you will be equipped with enough history to ponder another question: where do we go from here?

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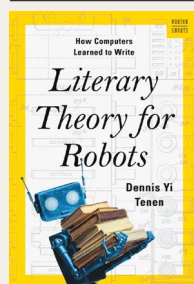
## **Books in brief**



### **Vision Impairment**

Michael Crossland *UCL Press* (2024)

On a typical day in his clinic, London-based optometrist Michael Crossland assesses both young children and centenarians with low vision. Severe vision impairment affects 350 million people around the world, many of whom in poorer countries lack access to any eye care. His fascinating, sometimes moving, account – mixing ophthalmology with the stories of his patients and many others – reveals that life with vision impairment can be “just as rich and rewarding as life with 20/20 vision”.



### **Literary Theory for Robots**

Dennis Yi Tenen *W. W. Norton* (2024)

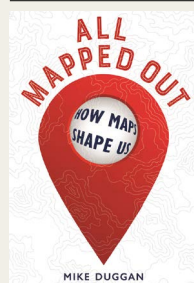
Artificial intelligence (AI) is rooted in the humanities, argues Dennis Yi Tenen, a comparative-literature professor and former Microsoft engineer. Chatbots are trained using electronic versions of tools such as “dictionaries, style guides, schemas, story plotters [and] thesauruses” that were historically part of the collective activity of writing. Indeed, a statistical model called the Markov chain, crucial to AI, arose from an analysis of vowel distribution in poems by Alexander Pushkin. Tenen’s cogitation is a witty, if challenging, read.



### **The Last of Its Kind**

Gísli Pálsson *Princeton Univ. Press* (2024)

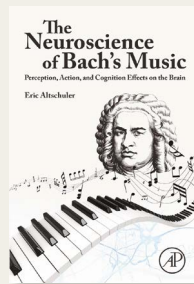
Living species could never become extinct, thought naturalist Carl Linnaeus. Charles Darwin disagreed, saying extinction was a natural process. Then ornithologists John Wolley and Alfred Newton began studying great auks, flightless birds living on remote islands in the North Atlantic Ocean. They visited Iceland in 1858 to see great auks, but instead met locals who described killing off the birds – revealing how humans could extinguish a species. Anthropologist Gísli Pálsson tells the engaging story of this “key intellectual leap”.



### **All Mapped Out**

Mike Duggan *Reaktion Books* (2024)

Cultural geographer Mike Duggan works in partnership with the UK national mapping agency, Ordnance Survey, to study everyday digital-mapping practices. Important as it is, digital mapping is not superseding analogue maps, he observes in his global history of cartography, which begins with Palaeolithic carvings. Sales of Ordnance Survey paper maps are rising, perhaps because of their convenience. “Although digital maps are improving constantly in accuracy and design, they do not always live up to those promises.”



### **The Neuroscience of Bach's Music**

Eric Altschuler *Academic Press* (2024)

Physician and neuroscientist Eric Altschuler regards J. S. Bach as the greatest composer ever, as do many others. Altschuler’s pioneering study – illustrated with numerous musical examples – aims to show how Bach-centred neuroscience “can help us better appreciate perceptual and cognitive affects in Bach” and create better performances of the composer’s work. It also teaches us how music perception is not localized to one region of the brain but occurs throughout it, and varies from person to person. **Andrew Robinson**