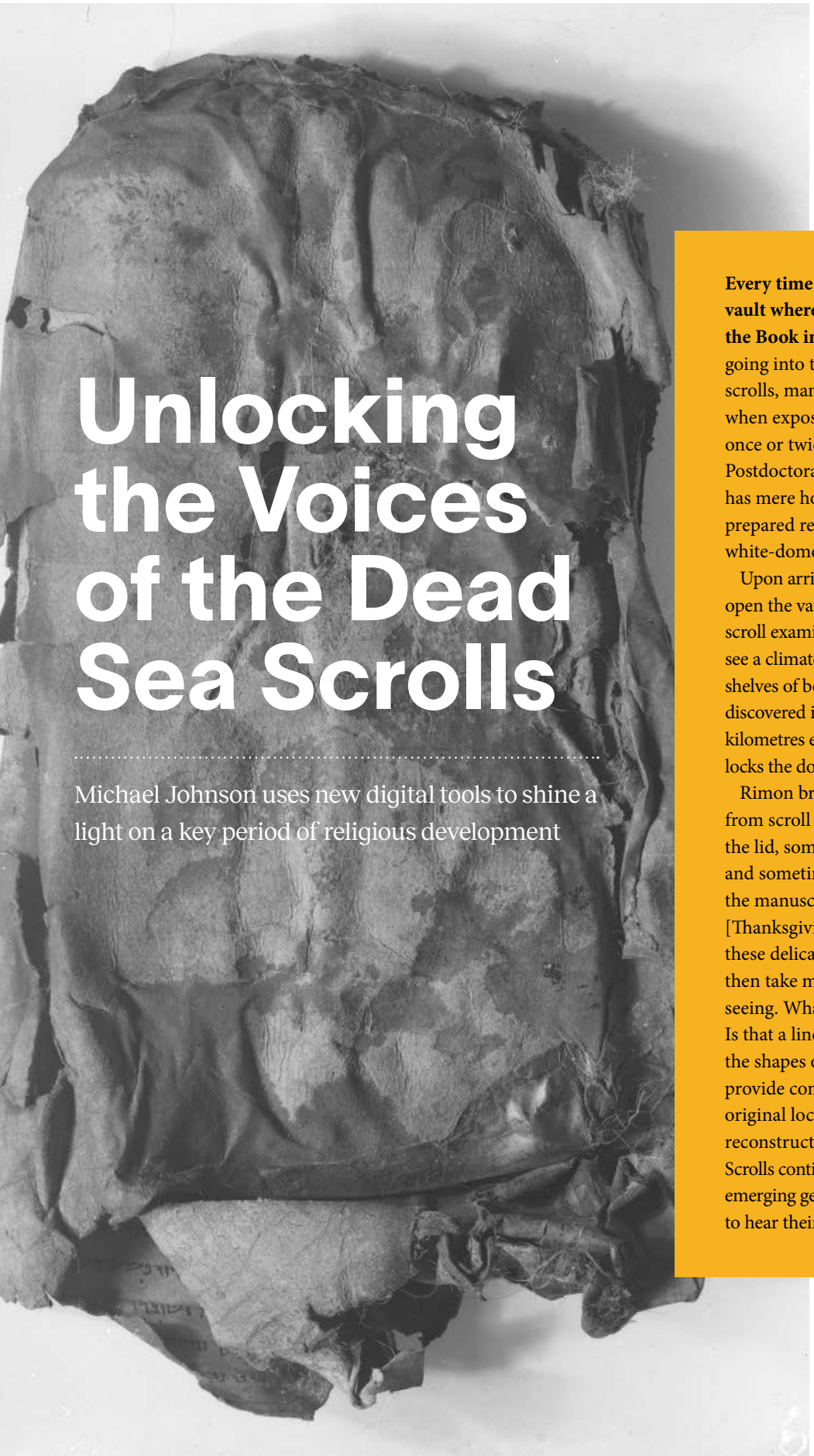

Many more than 2,000 years old, the Dead Sea Scrolls — including 1QH^{a} — opened a window onto a lost world of Jewish religious practice during a critical juncture in the development of traditions that would eventually shape Western worldviews.

Unlocking the Voices of the Dead Sea Scrolls

Michael Johnson uses new digital tools to shine a light on a key period of religious development

Every time Michael Johnson enters the high-security vault where the Dead Sea Scrolls are held in the Shrine of the Book in Jerusalem, it feels a bit mystical — "like you're going into the holy of holies," he says. The parchment scrolls, many more than 2,000 years old, deteriorate rapidly when exposed to air and light, so his access is limited to once or twice a year. Johnson, an Azrieli International Postdoctoral Fellow at the Hebrew University of Jerusalem, has mere hours to work through months' of painstakingly prepared research questions during each of his visits to this white-domed repository at the Israel Museum.

Upon arrival, conservator Hasia Rimon unlocks and cranks open the vault's huge steel door and leads Johnson into the scroll examination room. Through a set of glass doors he can see a climate-controlled storage area with floor-to-ceiling shelves of boxes containing the first Dead Sea Scrolls to be discovered in 1947 in Cave 1 at Qumran, located about 50 kilometres east of the vault. After an armed guard shuts and locks the door behind them, they settle in to work.

Rimon brings one of the day's predetermined boxes from scroll 1QH^{a} to the examination table and removes the lid, sometimes revealing large sections of a manuscript and sometimes boxes of smaller fragments. (1QH^{a} is the manuscript number for Cave 1, Qumran, Hodayot [Thanksgiving], scroll A.) Only Rimon is allowed to handle these delicate parchments. Like detectives, she and Johnson then take measurements and talk through what they are seeing. What can this fragment's damaged edge tell us? Is that a linen fibre attached? Are there changes in the shapes of the fragments? Such minute details can provide compelling new clues, helping us determine the original location of the fragments and test current scroll reconstructions. Far from inert and silent, the Dead Sea Scrolls continue to be deciphered — and Johnson is part of an emerging generation of scholars using powerful digital tools to hear their voices.

By Chris Wiebe
Photographs by Ariel van Straten

The discovery of the first seven Dead Sea Scrolls by Bedouin shepherds created an international sensation, which was compounded by the discovery over the following decade of nine more caves at Qumran containing the fragments of 950 additional Jewish and Hebrew scrolls from 445 different literary compositions. That only a handful of scrolls in this miraculous cache were intact — many were just heaps of confetti — did nothing to blunt their collective impact. These scrolls threw open a window onto a lost world of Jewish religious practice. Composed between 300 BCE and 70 CE, they fill in our picture of what was happening at a critical juncture in the development of Jewish religious traditions that would eventually feed into and shape Western worldviews, explains Johnson, whose specialty is early Judaism and psalms and prayers from the Second Temple period (515 BCE to 70 CE). "Before the Dead Sea Scrolls," he says, "there was much less indication of how ancient Jews conceived of their scriptures as a corpus, or to what extent they were moving towards the codification of those scriptures into a formal canon resembling the Bibles we have today. It turns out that their conception of authoritative scripture was much more fluid and broader than we realized."

Although revolutionary in content, the fragmented state of the scrolls has created an ongoing physical and interpretive jigsaw puzzle for scholars, which immediately attracted Johnson. "I started out in biblical studies," he recalls, "and one of the first things you learn is that this material has been researched for thousands of years and it is very challenging to say something new." Early in his graduate studies, which began at Emory University in his native United States and culminated in a PhD at McMaster University in Canada, his interest in the Hodayot began with a paper on the scroll 1QH^{a}, which contains collections of previously unknown ancient psalms or hymns. Johnson soon learned the texts were incomplete, their interpretation uncertain and the position of the scroll fragments unsure. He grew excited by the opportunity to contribute to their refinement. The liturgical dimensions of the texts, such as the communal blessing and praise of the deity alongside the angels at the prescribed times for prayer, also drew him in because they are some of the only surviving texts illuminating these aspects of ancient Jewish religious life in this period.

Johnson is working with renowned scrolls scholar Esther Chazon at the Hebrew University, seeking to resolve critical facets of the Hodayot puzzle. His time in Israel as an Azrieli International Postdoctoral Fellow is simultaneously accelerating his innovative work and knitting him into the scholarly community. "The research I'm doing now," he says, "would have been impossible without access to the Shrine, the photographic archives and the ability to learn at the feet of conservators like Hasia Rimon who are working with these scroll materials on a daily basis." While thematically linked, the two Hodayot scrolls at the centre of Johnson's research agenda have taken him down starkly different research paths — one quite traditional and the other stridently new.

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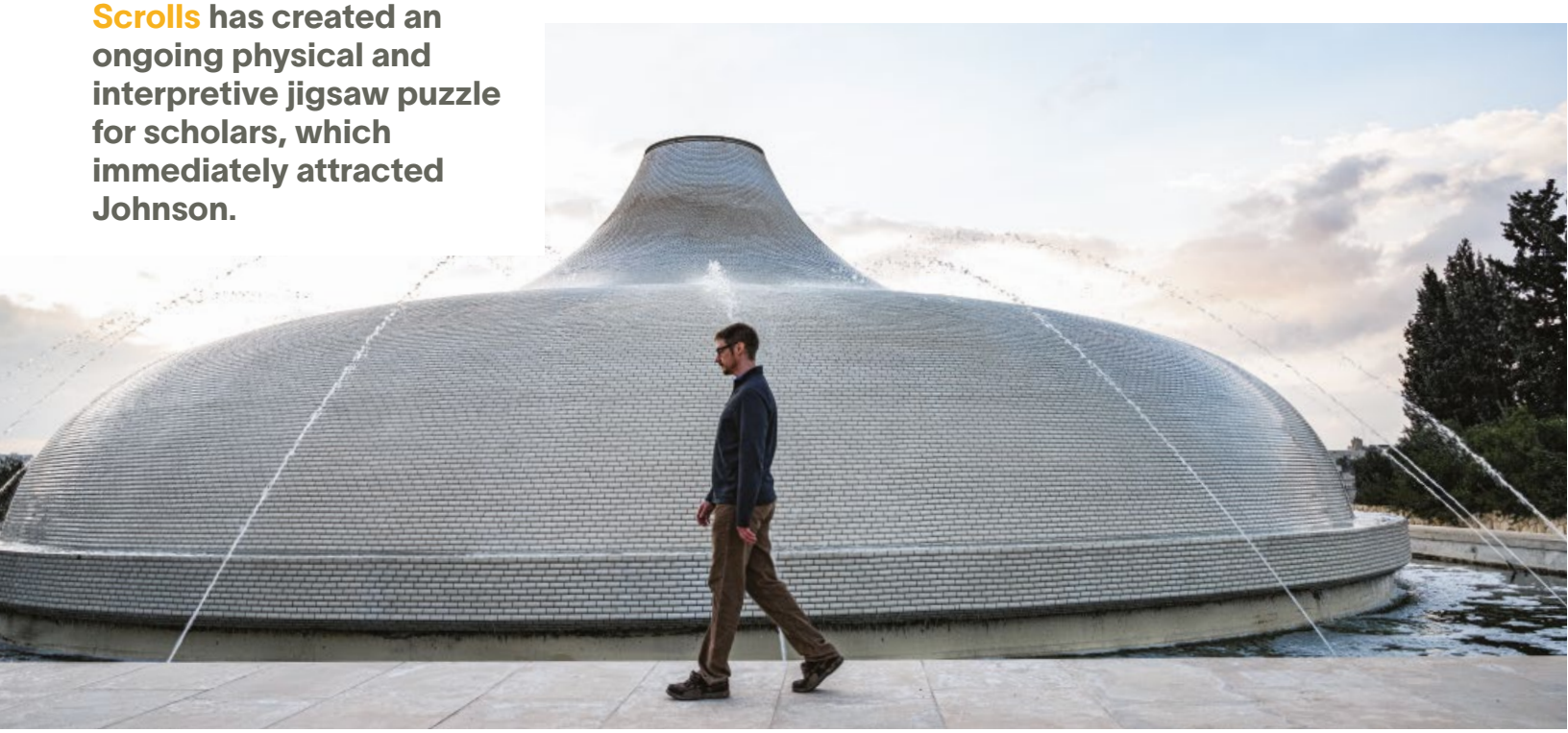
Michael Johnson outside the Israel Museum's Shrine of the Book, a repository for the first seven Dead Sea Scrolls discovered at Qumran in 1947. The shrine's white dome symbolizes the lids of the jars in which the scrolls were found.



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Because some of the scrolls he studies were found wadded (left), Johnson is developing new approaches to 3D modelling (above) to confirm which fragments belong to which scroll.

The scroll 1QH[a] is unique because it was found in two bundles — one roughly wadded and the other more carefully folded — and is about 75 per cent complete. German scholar Hartmut Stegemann's first reconstruction of the scroll was developed as an unpublished dissertation in the 1960s, but questions about whether the two bundles are indeed part of the same scroll, or if it is even a liturgical document as some scholars have claimed, have continued unabated. Like a forensic cold case investigator, Johnson went back to the Shrine of the Book to examine the unpublished photos that were taken when the bundles were first opened by James Bieberkraut and photographed by Helene Bieberkraut around 1948. Methods for photographing and conserving scrolls were still being developed at the time, and their process had significant scientific gaps: not enough photos were taken, the sequence of photos is not clear, and the process for separating the parchment layers in the bundles and flattening them likely caused irreversible damage.

Nevertheless, by comparing the bundle opening photos with the scroll fragments in the Shrine's vault and Stegemann's work, Johnson submitted two major scholarly papers for review in the summer of 2021. The first affirms that columns 1 to 8 and 9 to 28 of 1QH[a] are indeed from the same scroll, not parts of two separate scrolls that were accidentally combined. The second paper proposes new fragment placements in columns 1 to 8 that deviate from Stegemann's original reconstruction. "This new ordering of the psalms is quite a big change," Johnson says, "as the psalm arrangement puts even greater emphasis on praising God with the angels and drawing in the audience to participate. There is a stronger liturgical orientation reflected in my revised reconstruction than scholars at first realized."

Johnson's 1QH[a] work involved conventional research techniques; however, his research on 4QH[a] builds on his pathbreaking work using three-dimensional digital modelling to check the accuracy of previous scroll reconstructions. The standard approach to reconstructing a scroll involves not only fitting fragment shapes together, but also examining the repeating sequence of damages (chips, breaks, holes, or the impressions of stitched seams) in the manuscript. The guiding principle is that as you get closer to the core of the scroll, where the diameter of the turns of the scroll becomes narrower, the damage to these edges decreases in distance from each other at a regular mathematical rate. Researchers use this information to determine the positional layers of scroll fragments even if they were not immediately connected. Unfortunately, the measurements used to make reconstructions are not always published and errors have sometimes crept into this theoretical modelling.

Johnson's innovative response — successfully test driven on the relatively intact War Scroll (1QM) — is to stitch together scroll photographs and roll the resulting two-dimensional plane around an Archimedean spiral to check whether the damage patterns line up. "I'm checking the work earlier scholars have done on material reconstructions," says Johnson, "by seeing if the rationale for those reconstructions holds up when you visualize the entire scroll as a 3D model."

The 1QM test helped him weigh in on disagreements in the literature about where some fragments belong in the reconstruction or whether they belong with the same scroll at all. The fragments making up column 19, for instance, are physically detached from the rest of the scroll, but the three-dimensional modelling

Johnson's research would not be possible without access to the scrolls, archives and expertise of conservators at the Shrine of the Book.

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showed that the patterns of damage cohere well with the damages in several layers of the scroll beneath, strengthening the case for associating column 19 with 1QM. This capability will be especially important for Johnson's ongoing work on 4QH[a] because the scroll is exceptionally fragmented and its original length unknown. While Stegemann boldly forged ahead and created a reconstruction of the scroll between 1994 and 1998, he didn't provide technical notes on his measurements and damage pattern analysis; Johnson hopes a three-dimensional model will help him reverse engineer Stegemann's process and explore ways to place new fragments or adjust currently placed fragments.

Once completed, Johnson is hopeful that his work with 4QH[a] will demonstrate the exciting potential of three-dimensional modelling to the scrolls research community and prompt broad uptake. The inexorable deterioration of the Dead Sea Scrolls gives the use of new technological tools fresh urgency. "Everyone is scrambling to do the best work while we still can," says Johnson. "The parchments are darkening and as that process moves on it will be increasingly difficult to distinguish writing from the parchment. So, the critical issue is to use the best cameras and techniques to capture this material at its best now, because we are slowly losing it."

Living on the Mount Scopus Campus of Hebrew University has given Johnson the opportunity each day to put his research in fresh new contexts. On his morning runs, half the time he is looking over the Temple Mount, and the other half gazing over the Dead Sea toward Qumran. "It's amazing to live here," he enthuses, "because you are in a place that was such an epicentre for ancient Jewish scribes laying down the traditions that shaped generations." Johnson's meticulous, trailblazing work recovering the Dead Sea Scrolls is bringing us closer to the voices of those scribes and the vibrant lives of their communities. ▲●■