

The Pharos: A beacon for medicine

Richard B. Gunderman, MD, PhD



Dr. Gunderman (ΑΩΑ, University of Chicago, 1992) is the Chancellor's Professor of Radiology, Pediatrics, Medical Education, Philosophy, Liberal Arts, Philanthropy, and Medical Humanities and Health Studies at Indiana University in Indianapolis, IN. His email address is: rbgunder@iu.edu.

The Eiffel Tower in France, Italy's Colosseum, the Great Wall of China, Russia's Kremlin, the Great Pyramid of Giza in Egypt, Australia's Sydney Opera House, the Taj Mahal in India, and the United States' Statue of Liberty—such monuments both symbolize the past and help form future citizens. Of course, Alpha Omega Alpha Honor Medical Society is not a nation, nor does it have a large physical monument; but when its flagship journal, *The Pharos*, first took its name in 1938, it assumed the moniker of one of the Seven Wonders of the Ancient World. It is important that the society's members understand both the story of the ancient Pharos and what it signifies for the journal and medicine's future.

Looking to the past

The Pharos got its name from the island on which it was built, just off the coast of the ancient city of Alexandria located on the northern coast of Egypt, a bit more than 100 miles northwest of present-day Cairo. The next-to-last to be constructed of the ancient world's Seven Wonders, it was also the only one that served a practical purpose. Specifically, it functioned as a beacon and lighthouse, guiding ships along a very treacherous coastline as they approached the harbor of Alexandria. Completed over a period of about twelve years, it stood for approximately a millennium and a half, from about 280 BC to AD 1303, and it was said to have originally carried a price of 800 talents of silver.

No one knows for sure, but it is estimated that the structure stood between 350 and 400 feet tall, making it one of the tallest manmade structures of the ancient world. By comparison, the Great Pyramid of Giza stands 455 feet. It was built on the island's limestone foundation and constructed mainly of limestone and granite, the latter floated down the River Nile on rafts. Of note, to describe its construction as a single event is misleading, since the island was subject to multiple earthquakes and the structure had to be rebuilt multiple times. The final, fourteenth century opportunity to rebuild was missed mainly due to an epidemic of

plague that made materials and workers especially hard to come by.

Alexandria was one of more than a dozen cities that Alexander of Macedon founded around the ancient world, an especially attractive site thanks to its natural harbor. Although Alexander did not linger there long, opting instead to continue his conquests eastward, he left behind leaders to oversee the city's construction. When Alexander died in Babylon in June of 323 BC at the age of 32, his empire broke apart, and the portion that included Egypt came under the rule of Ptolemy. It was Ptolemy's idea to build the Pharos, and thanks to the wealth of the new city, the project proved feasible. It would serve not only to guide ships but also as a towering symbol of the city's power.

It is thought that the island of Pharos acquired its name from a misunderstanding of who owned it—namely, the Egyptian pharaohs. Its former inhabitants were rumored to be wreckers, people who made their living plundering the numerous shipwrecks that regularly occurred along the treacherous coast. So famous was the Pharos that its name entered numerous languages as a word for lighthouse, including French, Greek, Italian, and Spanish. In fact, at first the Pharos served only as a beacon as ships traveled only in daylight. It was only later that an artificial source of illumination was added at the top. It is thought that wood and dung were burned and the light focused with bronze mirrors.

When Alexander's forces conquered Egypt in 332 BC, they encountered relatively little resistance. In fact, they were welcomed as liberators from Persian oppression. Interestingly, Ptolemy later acquired Alexander's body as it made its way back from Babylon toward his home in Macedon, serving as yet another symbol of the city's power. The Hellenizing influence of Alexander enabled the new city to draw on the strengths of both Egyptian and Greek cultures, forming a hybrid that made it one of the great intellectual centers of the ancient world. This status was epitomized by the world-famous library at Alexandria, which was eventually destroyed by fires in 391 AD.

The library was part of a larger institution of learning named after the Muses, the nine ancient Greek goddesses of the arts, whose name provided the origin for our words music and museum. It is estimated that it may have contained as many as 700,000 scrolls, and it soon acquired a reputation as a world center of learning. Among the many texts to be found there were writings of

ancient philosophers such as Plato and Aristotle, dramatists such as Aeschylus and Sophocles, mathematicians such as Euclid, and physicians including Hippocrates and Galen. Its holdings also included texts from other civilizations, such as Egypt, India, and Persia.

Positioned at the western end of the Nile River delta, Alexandria was an extremely cosmopolitan city of the day, reigning as one of the world's premier hubs of intellectual, political, and economic activity. It served as a juncture between the East and West, linking Africa, Europe, and Asia, and provided a meeting place for Greeks, Egyptians, Romans, and Jews. Its population is thought to have exceeded 500,000. Even its religious practices were hybridized, combining elements of Greek, Roman, and Egyptian traditions. The Greek version of the Jewish scriptures, the Tanakh, was produced in Alexandria and is known today as the Septuagint, for the 70 translators who produced it.

Looking to the future

The story of the Pharos of Alexandria offers inspiration regarding the future of AQA's journal and the profession of medicine. For one thing, the fact that it was counted for centuries among the most marvelous structures in the world serves as a reminder of the importance of wonder. The intricacy of the human cell, the complex interplay between the forces of health and disease, and the rich narratives of patients and physicians all evoke wonder. We are here not just to solve problems and fix what is broken. An essential aspect of our calling is simply to marvel at the beauty and complexity of the human form and human experience, which evoke both gratitude and respect, even reverence.

Likewise, the Pharos was constructed not once and for all time. It underwent many modifications, occasionally even being rebuilt. So, too, the tissues of the human body are being rebuilt constantly. Consider the skeletal system, which responds to decreasing mechanical demands (such as weightlessness) by losing strength and increasing demands (such as weightlifting) by fortifying its structure. So, too, *The Pharos* of AQA and the profession of medicine are subject to varying stresses and strains over time, and it is vital that we make time to discuss the demands being placed on us and do our best to devise strategies to respond appropriately. Ultimately, we become stronger by adapting to new challenges, which we should treat not as threats but as opportunities.

A related lesson concerns the capacity for growth, development, and self-healing of living organisms, as opposed to buildings, machines, and other artifacts. The builders of the Pharos incorporated many design features to make it durable, such as using lead as mortar to bind its stones, which conferred flexibility during seismic activity. But they could not engineer the structure to heal itself, and the same is true of professional journals and the profession they represent. Only the dedication of human beings can sustain and enhance them, and this requires each generation to step up and take an active role in anticipating failures and working hard to repair damage when it inevitably occurs. Neither the journal nor the profession can survive without devoted service.

The cost of the Pharos of Alexandria is one of its most notable features. Eight hundred talents represented a huge sum. By comparison, a single talent represented the annual wages for the full-time crew of a warship. Hence the builders of the Pharos were making a massive investment. If *The Pharos* of Alpha Omega Alpha and the profession it represents are to thrive, we must be prepared to make substantial investments in them as well. It takes resources to sustain a lively and illuminating professional discourse, and members of the profession must be willing to invest not only their treasure but also their time, talent, and testimony in service of a brighter future. Failing to support professional organizations, for example, represents penny-wise but pound-foolish decision-making.

The Pharos' combination of monument and beacon, unique among the Seven Wonders, serves as a reminder that at medicine's core lies the conjuncture of structure and function. Early physiologists could tell from the heart's structure that it functions as a pump. The same may be said more recently for various ATP-powered transmembrane pumps, such as the sodium-potassium pump that transports ions across membranes against concentration gradients. These pumps make possible vital functions such as the maintenance of cell volume, nerve conduction, and muscle contraction. Medical fields such as pathology and radiology are premised on the view that disordered function has structural correlates.

Alexandria's Pharos combined beauty with utility. Securing food, housing, clothing, and the like is essential to human welfare, but so too is augmenting what is pleasing, enjoyable, and fulfilling in life. A journal should please not only the intellect but also the aesthetic sense, and a profession should strive to do not only what is

necessary or advantageous but also what is noble and good. The architectural elegance of the Pharos, with its three tiers of square, octagonal, and circular structure, its marble-like white limestone, and its beautiful crowning cupola and statue serve as a reminder not to neglect the beautiful in the work of medicine, recognizing that acts of compassion, generosity, and courage are as vital to the profession as generating revenue.

The Pharos of Alexandria served multiple purposes beyond its function as lighthouse and symbol of power. For example, it also served as a watchtower, making it possible to detect approaching enemy forces long before their arrival. Simply put, such an elevated perspective permitted greater range of vision. By helping to guide ships safely to harbor, it catalyzed commerce. And like the library of the city, it also served the function of learning, providing a great vantage point for astronomical observation. So, too, the journal and the profession need to serve multiple purposes, ensuring that the practice of medicine remains attentive to threats, economically viable, and focused on the advancement of knowledge in the diagnosis and treatment of disease.

Another key feature of the Pharos concerns its stature. It rose above the ground nearly as high as any manmade structure in its own day, and so too must the journal and the profession keep subject matters such as ethics, professionalism, biography, history, and literature well within physicians' fields of view. The important matters from which we avert our gaze—or that we allow to drift into the far reaches of our peripheral vision—will cease to command the attention they deserve and fall into neglect. Should even a single generation of physicians become so preoccupied with science, technology, and economics as to allow attention to medicine's humane side to lapse, the reckoning could be long and severe.

Like the city of Alexandria, the profession of medicine will thrive so long as it fosters the expression of diverse viewpoints and traditions. So often in the ancient world, as in our own, the cities and cultures that prosper are those that serve as catalysts, enhancing the rate, range, and depth of interaction. Likewise, AΩA's journal serves as a cross-pollinator, facilitating the interchange of humanistic perspectives unlikely to appear so prominently in many of its contemporaries. When we learn to attend to multiple voices and look at matters from others' points of view, we enhance our practice as teachers, investigators, and, above all, as caregivers who must understand our patients in order to care for them.

In a virtual age, when patients, physicians, and other health professionals increasingly interact remotely and online, the Pharos of Alexandria also serves as a reminder of the importance of place and presence. To learn, contribute, build relationships, and care as effectively as possible, we need to meet face to face and even skin to skin, at least in terms of the comforting and healing power of touch. Ancient people from all over the Mediterranean world journeyed to this great center of knowledge, and we, too, must dedicate ourselves not only to looking and listening in on but also to actually being where the action is. AI can process information, but only persons can be truly present at the bedside.

Just as the Pharos marked Alexandria, so its namesake journal serves as a focal point for many attributes that make medicine great. Deep respect for learning and experience; loyalty to the truth, as best we see it, over self-interest; an abiding concern for fostering human excellences such as compassion, generosity, and wisdom; and the determination to do right by both those who bequeathed us this great profession and those who will follow us in generations to come—these are some of the ideals for which the journal stands tall. Like the great monument, it reminds us that we are part of something greater, fostering the essential virtue of humility.

Past, present, and future

Thanks to its library and the larger center of scholarship and research of which it was a part, Alexandria looked to both the past and the future. The library housed an unparalleled number of great sources of insight from the past, but it also focused on advancing human knowledge even further. To do this work well, the profession of medicine—so relentlessly forward looking in its appetite for new discoveries and innovations—needs reminders not to forsake its past, including the teachings of some of the wisest of physicians: Hippocrates, Galen, Avicenna, Maimonides, and Harvey, among many others. Yet their contributions would be forfeit if we did not carry on their quest for deeper understanding and better ways of caring for our patients and proving ourselves worthy to serve the suffering.