In 1220, a Muslim doctor was on his way to see his patient, the Almoravid ruler of Sevilla. By the side of the road he saw an emaciated man holding a water jug. The man’s belly was swollen, and he was in obvious distress. “Are you sick?” the doctor asked. The man nodded. “What have you been eating?” “Only a few crusts of bread and the water from this jug.” “Bread won’t hurt you,” said the doctor. “It could be the water. Where are you getting it?” “From the well in town.”

The doctor pondered a moment. “The well is clean. It must be the jug. Break it and find a new one.” “I can’t, whined the man, “This is my only jug.” “And that thing bulging out there,” replied the doctor, pointing to the man’s abdomen, “is your only stomach. It is easier to find a new jug than a new stomach.”

The man continued to protest, but one of the doctor’s servants picked up a stone and smashed the jug. A dead frog spilt out with the foul water. “My friend,” the doctor said to the patient, “look what you have been drinking. That frog would never take you with him. Here, take this coin and buy a new jug.”

When the doctor passed by a few days later, he saw the same man sitting by the side of the road. His stomach had shrunk; he had gained weight, and his color was back. Seeing the doctor, the man heaped praise on him.

--- ADOPTED FROM AN ARAB DIARY, 12TH CENTURY ---

In the Western caliphate, doctors exhibited more independence of thought than their more classical-trained eastern colleagues.

But while Alhazan Baghdad, with the House of Wisdom and the first universities, was home to the golden age of Islamic medicine, the center of learning and progress began to shift westward in the eighth century, to al-Andalus, today’s southern Spain. The caliphate had taken power from the Umayyads based in Damascus. First Abd al-Rahman, grandson of the 10th Umayyad caliph, escaped the massacre of his relatives and in 786 it took asylum in Spain. Within a few years, the intrepid ruler had carved out a rival caliphate with its capital at Cordoba, and by the late 10th century Cordoba had surpassed Baghdad as the center of intellectual activity in the Islamic world.

Cordoba’s 70 libraries, 400 public baths, 1000 mosques and 50 universities were available to all of its one million residents. Cordoba University, founded in the eighth century, was a pioneer in the center of learning and its library held at least 250,000 volumes. At that time, the library of the University of Paris held some 450 volumes. It drew scholars from all over Europe—one of them, Gerbert of Aurillac, later became Pope Sylvester II, who replaced Constantine the Great in the Roman imperial title of “Aurelian” emperors, with today’s “Aurelian” number. Al-Andalus was soon home to accomplished and innovative philosophers, geographers, engineers, architects and physicians.

In the Western caliphate, doctors differed from their eastern counterparts. Although Cordoba and Baghdad were in close contact intellectually, the Western physicians exhibited more independence of thought than their more classical-trained eastern colleagues, offering no blanket endorsement of the Galen or the Cosmology of Ibn Sina, the 10th-century Bdel Hanur, born physician who was the Arab world’s equivalent of Aristotle and Leonardo. Instead, they challenged and rejected both when their own experience justified it. Their writings and research showed their preference for the concise, the brief and the exact, as contrasted with the discursive, often hair splitting, subtleties preferred by the scholars of the East.

While the Western Islamic world produced hundreds of insightful and even brilliant medical men between the ninth and 12th centuries, five stood at the pinnacle of medicine during their era, and their influences reverberate even now, more than a millennium later.

--- THE FATHER OF SURGERY ---

Born in 919 CE just north of Cordoba in Al Zahir, the royal city of Abd al-Rahman III, Abu al-Qasim Khalid ibn al-‘Albas was known to contemporaries as al-Zahir, and his name was Latinized...

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Illustrations of surgical instruments from a 13th-century Arabic copy of Al-Zahrawi’s On Surgery. Top: Detail from a folio based on the STS "Catalan Atlas" by Abraham Cresques.
Alistair's detailed illustrations of surgical instruments were simulated in Europe in Latin translation in the 14th century.

This 15th-century Italian illustration depicts the presentation of a work by Ibn Zuhr of Seville, translated into Latin by John of Capuan.

Ibn Zuhr also wrote about how diet and lifestyle can help a person avoid developing kidney stones. He gave the first accurate descriptions of neurological disorders, including meningitis, intracranial thrombophlebitis and medialist tumors, and he made some of the first contributions to what became modern neuropharmacology. He provided the first detailed report of cancer of the colon. Ibn Zuhr was the first to explain how to provide direct feeding through the gut or rectum in cases where normal feeding was not possible—a technique now known as parenteral feeding.

Ibn Zuhr introduced the experimental method into surgery, using animals as test subjects—using, for example, a goal to prove the safety of a tracheotomy procedure he devised. He also performed post mortem on sheep while doing clinical research on how to treat ulcerating diseases of the lungs. Ibn Zuhr was the first physician known to have performed human dissection and to use cadavers to enhance his understanding of surgical techniques.

Ibn Zuhr established surgery as an independent field by introducing a training course designed specifically for future surgeons before allowing them to perform operations independently. He differentiated the roles of a general practitioner and a surgeon, drawing the metaphorical "red lines" at which a physician should stop during his management of a surgical condition, thus further helping define surgery as a medical specialty. He was also among the first to use anesthesia, performing hundreds of surgeries after placing spoons soaked in a mixture of cannabis, opium and hyoscymamine (scopolamine) over the patient's face.

Not least, by seeing to it that both his daughter and his grandson went into medicine, he became a pioneer in a different way. Though largely limited to obstetrics, these women began a tradition in the Muslim world that accepted females as medical doctors 700 years before Johns Hopkins University graduated the first American female physicians.

Doctor and Philosopher

Born in Córdoba in 1126 and at one time a student of Ibn Zuhr, Al-Abd al-Wahid Muhammad ibn Ahmad ibn Muhammad ibn Rashid was in many respects the western caliphate what Ibn Sina was to the eastern one. Known in Europe as Averroes, he became known mainly for his works on philosophy. Ibn Rushd's principal medical work, a slender volume called Kitab al-Kulliyat fi Tilb (General Rules of Medicine), became an important preceptor of medicine. Beginning with a brief anatomical survey of the human body, the book continues with sections on the functions of the various organs, symptoms, diagnosis, diet, drugs, poisons, baths and the role of exercise in maintaining health. The sections on surgery briefly cover the treatment of abscesses and the use of strychnine, counterzation and ligatures. Perhaps most notably of all, he observed that smallpox "is a disease (that) attacks the patient only once"—the first known reference to acquired immunity.

Doctor in Exile

As an Averroisite (Latinezed to Maimonides) was a Renaissance man before there was a Renaissance. He too was born in Córdoba, just 12 years after Ibn Rushd, to a family that had produced eight generations of scholars. The towering genius of his era, a Jew living in a Muslim world, his achievements covered law, philosophy and medicine. At an early age, he developed an interest in science and medicine. In addition to reading the works of Muslim scholars, he also read those of the Greek philosophers made accessible through Arabic translations. His great work on Jewish law was written in Arabic using the Hebrew alphabet, and as a religious scholar he opposed the mingling of religion and medicine. He was the only intellectual of the Middle Ages who truly personified the confluence of four cultures—Greco-Roman, Arab, Jewish and Europeans.
One of Maimonides’s key contributions was the idea that, in medicine, personal empirical experience trumps written authority.

When he was 10 years old, the less-than-tolerant Almoravids had conquered Córdoba. They offered the city’s Jews and Christians the choice of conversion to Islam or exile or death. Maimonides’s family chose exile, and they eventually settled near Cairo. When famine tragedy reduced them to penury, he took up the practice of medicine.

Maimonides wrote to known medical works in Arabic. They describe, among much else, conditions including asthma, diabetes, leprosy, and syphilis. They emphasize moderation and a healthy lifestyle. A doctor, he wrote, must be knowledgeable in many disciplines, treat the whole patient and not just the disease, heal both the body and the soul, and must himself be imbued with human and spiritual values, the foremost of which is compassion.

Throughout his medical works Maimonides often challenged what he called Galen’s “arrogant presumptions” when it differed from his own experiences, leading to one of his key contributions: the idea that, in medicine, personal empirical experience trumps written authority. Nonetheless, his passion for order and learning led him to abridge the Roman physician’s massive literary output to a single book of key extracts that a physician could carry in his pocket. Though he was also a Talmudic rabbi, when it came to the understanding of disease, Maimonides was what today we would call a “natural scientist” - a rigorous empiricist - and he strove to clearly divorce medicine from religion. At a time when magic, superstition and astrology were widespread in medical practice, his writings contain no references to these, nor to Talmudic medicine. That which is correct, he argued, is that which works.

Maimonides taught that individuals should look after their own health by avoiding bad habits and seeking medical attention only when needed. “One’s attention,” he wrote, “should first focus on the maintenance of natural bodily warmth, before anything else. That which is best means this is the performance of moderate physical exercise, which is good both for the body and soul.” He goes on to prescribe a daily regimen of walking for elderly patients, something with a distinctly modern ring to it. He also discusses the benefits of massage and touch as a means of stimulating the innate “heat” of the body, which, as it rejuvenates the body naturally. He recognized the medical benefits of positive thinking, leading to an early form of psychosomatic medicine.

Whether certain ailments or techniques were to be attributed to his rational world view was unimportant compared to the needs of the patient. If they made the patient feel better, he wrote, then having them present was best “to test the mind of the patient he too greatly disturbed.”

In the 14th-century French version of al-Zahrāwī’s Arrangement of Medical Knowledge, a sick man and a crippled man are presented to a doctor. Al-Zahrāwī’s compendium was used in Europe till the late 16th century.

Unfortunately, Ibn Al-Nafis’s fall into undeserved obscurity was not unique or even particularly unusual. Over those medieval centuries Muslim physicians by the tens of thousands, the great and the ordinary, lived and worked mostly outside centers of medical science. While they toiled, small groups of Christian and Jewish scholars also labored, filling in a century or so of translations and commentaries that the Muslim predecessors had once filled for Al-Mutamid in Baghdad. Many were located along the porous, shifting, multicultural frontier with Spain where Toledo, Barcelona and Seville offered them support; others gathered in the cities of France, Italy and Sicily that were touched by Islam. They too became cultural bridges, returning to a reawakening West both the intellectual foundations it had foregone nearly a millennium earlier and a rich legacy directly from the right to the left side of the heart. Ibn Al-Nafis then correctly stated that the blood must pass from the right ventricle to the lungs, where its lighter parts filter into the pulmonary veins to mix with and then to the left atrium and finally onward to the rest of the body. It was the first time anyone was able to explain how air entered the blood.

Ibn Al-Nafis also hinted at the existence of capillary circulation, arguing “there must be small communications or pores [mujajdah] between the pulmonary artery and vein.” Though his hypothesis was limited to blood transit in the lungs, it would be confirmed for the entire body 450 years later when Marcello Malpighi described the action of capillaries. Moreover, after the 14th century, Ibn Al-Nafis’s discovery was lost, and it was not until 1914, when Egyptian physician Muhammad al-Din Altawi found a copy of the Commentary in Berlin’s Prussian State Library, that the full extent of Ibn Al-Nafis’s work was understood—showing that it was his, and not William Harvey some four centuries later, who had discovered the circulatory system.

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In a 14th-century French version of al-Zahrāwī’s Arrangement of Medical Knowledge, a sick man and a crippled man are presented to a doctor. Al-Zahrāwī’s compendium was used in Europe till the late 16th century.

of discovery upon which today’s western medicine is founded.

The physicians who produced this legacy of discovery in the Muslim world devised techniques and further unraveled enduring mysteries of the human body and mind. They established hospitals and the professions of surgery, medicine and pharmacy, invented surgical instruments and applied empirical methods to test hypotheses. They separated religion from science and opened a door for women. Many of their precepts of personal health, diet and hygiene are common sense today. Perhaps most important of all, they taught European physicians that sickness is only a deviation from health, and that the role of medicine is to cure disease.

If any of this seems too curiously self-evident to us, that is because progress turns yesterday’s discoveries into today’s everyday knowledge.

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Small Arabico Wood
2 Couscous Crossroads
Written by Gail Simmons
Photographed by Tor Egeland

Nominated for “The International festival of cultural integration.” Simly’s annual Couscous Feast highlights the humble grain that’s played a lead role for more than a thousand years on the island that is a historic hub of the Mediterranean.

12 Hafiz’s Gift
Written by Jane Weldon Grutz
Photography and drawings courtesy of Clover Farms and The Arabian Horse Trust

Carrying letters from both U.S. President Theodore Roosevelt and the Turkish ambassador in July 1905, Horner Davenport and two companions set out from America to visit Syria. His “head idea in undertaking the journey” was the purchase of Arabian horses “of absolute purity of blood,” from the great Araba tribe of Bedouins. For both private breeding and the US cavalry. But in Akko, a diplomatic blunder turned instead into the lifetime of brotherhood between Davenport and Ahmed Hafiz of the Anazeh, who led the American to horseradish surpassing Davenport’s highest hopes.

20 Kentucky’s Horse Olympics
Written by Brian E. Clark
Photographed by Larry W. Smith / EPA / Corbis

Every four years, the world’s top equines compete in a different city at the World Equestrian Games. This September, they came from 58 countries to Lexington, Kentucky for sport, history and cutting.

34 Pioneer Physicians
Written by David W. Tschanz

With their legacies of life-saving innovations, among the many who helped swing open the door to modern medicine were five whose contributions still resonate.

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Photo essay by Jamal Pentewey / Demoitix
Written by Maria Fantapple

“When I was a child, I used to jump with my friends for joy,” writes the Iraq photographer. His uniquely intimate, playful, portrait series offers Iraqis a realistic and energetic people a chance to touch that “bit of the child still within us.”

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Written by Julie Weiss

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