



Ibn Tufayl's *Hayy Ibn Yaqzan* A Scientist's Reading

By Riyam Kafri AbuLaban



The division between art and science is a new one. Prior to the Renaissance period when ties between the two fields were severed, both art and science fell under the same umbrella. Scientists were also philosophers. Aristotle spoke of ethical and philosophical issues as passionately as he tackled light and its nature. The most prominent Muslim philosophers were actually scientists: physicians, astronomers, and mathematicians. Or perhaps it is the other way around; the most prominent Muslim scientists were also philosophers. It depends on which viewpoint you take and whether the person speaking on the subject matter has had scientific training or not. In recent years a new field (perhaps an old but reemerging discipline) has arrived on the scene, ArtScience. The revitalised marriage of science and art is back.

ArtScience has a variety of outlets; examples include art residencies in science laboratories, science museums, and centres, and citizen science programmes that engage the average person with knowledge often thought to be too scientific to understand. In academia the perfect place for ArtScience to flourish is in liberal arts programmes whose main pedagogical goal is to graduate well-rounded students who are versed in their field of expertise and in other fields as well.

First-year Seminar (FYSEM) is a one-year sequel course offered at Al Quds Bard Honors College (aqb) – Al Quds University. It is a core college requirement for all first-year students. This type of course is typical in liberal arts colleges. Courses such as this create a common language between students and faculty. Faculty members with diverse backgrounds teach them. In fact, all are encouraged to teach this course at least once.

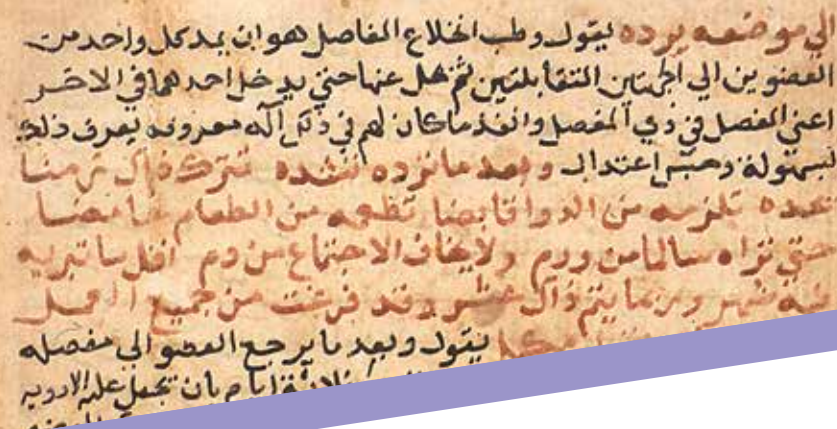
At aqb, courses like FYSEM (and there are quite a few) are received by

students with a mixture of love and hate. The heavy reading and difficult topics covered pose a serious challenge, but it is exactly these reasons that eventually cause the students to fall in love with the course. The course loosely conveys an overall theme. The spring course thesis hovers flexibly around seeking knowledge, truth, and justice. A variety of texts are examined, but the one text that resonated with our students is Ibn Tufayl's *Hayy Ibn Yaqzan* (translated by Lenn Evan Goodman). It is also the text in which I – a Palestinian, female, Muslim scientist – found inspiration and enjoyment in reading and teaching.

In the paragraphs that follow I recount my own reading of the text and attempt to show what a philosophical tale, which is often analysed through interdisciplinary lenses, sounds like for a scientist. Allow me first to share with you my excitement in teaching this text. As a modern-day scientist whose training is in computer-based drug design and discovery and whose interest lies heavily in the humanity of science, the idea of a physician writing philosophy was far more exciting than anything I could express on paper. Teaching this text left me sleepless many nights as I delved into scholarly literature and historical context. I was thrilled because I was finally coming close to answering a very personal question that I have struggled with

since I made the choice to go into science rather than the humanities. Can scientists write? Can scientists graze the best of both worlds, arts and sciences? And if so, can they be respected by their colleagues on either side? This has been a source of anxiety for me. The science world is not very forgiving; the drive to publish peer-reviewed original research haunts all of us infinitely. Scientists in Palestine are even more challenged because we not only suffer from limited resources (next to none in most academic institutions), but we are also burdened with heavy teaching loads that render most of us in class most of the week. Add to the mix strenuous commutes to our campuses, administrative responsibilities, and motherhood (for female PhDs, which takes at least two years out of research activity in between pregnancy and birth), and the end result is a sacrificed research career.

If the question of harmony between religion and philosophy is an important one for Ibn Tufayl, a medieval Muslim physician, then the question of the harmony between religion and science is an important one for a contemporary scientist in the twenty-first century.



IBN TUFAYL'S HAYY IBN YAQZAN

A PHILOSOPHICAL TALE



*Translated with an Introduction
and Notes by Lenn Evan Goodman*

WITH A NEW PREFACE

On the other hand, a traditional approach and view to scientists and those who pursue science leaves many talents untapped. Scientists are, in the public eye, confined to the lab, often speaking jargon that no one understands. Scientists cannot be creative writers, painters, or musicians, and they certainly are incapable of holding practical business positions. Scientists must remain in their ivory towers and run experiments that only the very privileged few understand. Ironically, science is placed into

this unimaginative box when the mobilising dynamo for scientific work is imagination.

This view is prevalent not only in contemporary Palestine but also worldwide. It is the exact opposite of the historical marriage between science and arts, science and philosophy, and science and religion. One need not look farther than Mesopotamia to find examples of Muslim "artscientists": Al Jahiz (zoologist, prose writer, philosopher, educator), Ibn Sina

(Avicenna, physician, and philosopher), and Ibn Tufayl (physician, and Islamic philosopher) are all compelling examples whose works form the basis for many modern disciplines today. My excitement in teaching Ibn Tufayl was deeply rooted in this notion of ArtScience and its importance. And it is this premise that frames the following analysis.

Hayy Ibn Yaqzan's story reads mainly as a philosophical story for most. Academics and philosophers alike agree that the primary message communicated by this beautifully constructed book is the ascension of human reason into mystical knowledge, the finding of God if you will. Both classical and contemporary intellectuals have written extensively on this theme. Gauthier, however, brings up a less obvious theme revealed subtly at the end of the story. He argues that Ibn Tufayl wanted to communicate harmony between religion and philosophy. Hourani argues in a paper published in the 1950s in the *Journal of Near East Studies*, that Ibn Tufayl needed to communicate and accentuate this harmony given the time period in which he lived. But what does the text read like for a contemporary modern-day chemist?

Perhaps one of the lurking themes that is not emphasised in academic literature (perhaps because scientists have not weighed in as much on Hayy Ibn Yaqzan) is science. In his introduction Goodman emphasises that wonder leads Hayy to the discovery of God, but it is reason that proves HIM [God] as Designer of the Universe. "Wonder discovers God in a beautiful, unexpected moment and sees Him in the working of the world. Reason proves HIM as Designer of the Universe, perfect Cause of Himself and Creator of all." (Goodman, p.11) Reason is fuelled by knowledge. Throughout the text this knowledge is more often than not scientific or related to science.

Before giving examples of scientific

knowledge, it is important to note that the meticulous construction of the book can be attributed to Ibn Tufayl's background as a physician. My students often wondered that if Ibn Tufayl had not been a physician would he have chosen to assemble the book the way he did? That he chose to divide Hayy's life into seven phases of seven years each, heptads or septenaries, can be seen as a reflection of his own knowledge of the human body's development and the meticulous mind of a top physician. It is no coincidence that the childhood years are all grouped together and further divided into smaller phases within that heptad. The first milestone Hayy reaches is at the age of two years. Up to that point he had been breastfed by his mother, a doe. At two he is weaned of the breast; he now follows his mother around and she provides him with fruits and nuts for nourishment. Academics can argue here that Hayy was breastfed for two years in accordance with Muslim tradition, which I completely agree with, however contemporary science has also shown that breastfeeding for extended periods of time renders children stronger with better immune systems. So one can read this part from a traditional viewpoint, or from a contemporary scientific position, which provides a practical reason for a religion-based tradition. Between the ages of two and seven Hayy develops

The theme for the spring-semester First-Year Seminar is Seeking Knowledge/Truth/Enlightenment. Students often complain that the course is too difficult and ask why they have to take it. The answer is always: because the university is your island and you are Hayy.

both physically and mentally. He learns that if he cries, his mother doe will bring him food or warm him or keep him cool. If one examines contemporary childhood development, Hayy has all the indicatives of a healthy child. He is curious, agile, and physically interested in his surroundings. Children learn through trial and error, and at the age of two years they begin to articulate themselves well. By the age of seven they err on the side of independence rather than dependence.

At around the age of seven, his mother passes away. His mother's loss leaves him with many questions. Hayy is initially determined to find the cause of his mother's death and fix it. His conclusion that the mother he once knew – who nursed him, fed him, and took care of him – is no longer, comes through a scientific experiment. Hayy performs an autopsy. This particular excerpt reads like an anatomy session in a biology class rather than a philosophical story. Ibn Tufayl meticulously communicates the anatomy of the doe's body. He introduces the three major cavities in an animal's body, chest, abdomen, and head. Then, with the detail of a physician and scientist, he maps out Hayy's first anatomy experiment. Through his extensive dissection, Hayy concludes that whatever left his mother's body cannot return. That it was the driving force for the body's vital signs, and that life came only from it. "The whole body was simply a tool ... His affection was transferred now to that being that was his master and mover." (Goodman, p. 115) Hayy's first taste of spirituality is sparked from knowledge, knowledge of the body. Knowledge of anatomy, knowledge of science.

The story is rich with examples where science is the central supporting actor. Ibn Tufayl creates a beautiful arch of knowledge in which Hayy first learns and understands animals (zoology), plants (botany), and inanimate objects

such as rocks and soil (geology). He recognises [bio]diversity of species but then immediately recognises that whatever is the governing force, or spirit, it must be the same for all. "This line of thinking...made it evident to him that all physical things, despite the involvement of diversity in some

is an interchange by which the being nourished replaces matter that breaks down by ingesting material similar to itself and assimilating this to its own substance." (Goodman, p. 124) This statement could easily fit into a nutrition or biochemistry text. The breaking down of material and its assimilation

Once Hayy masters anatomy through dissection and acquires all knowledge possible of the Earth, he turns his attention to the stars and observes them as they rise and set in perfect arches. He marvels at them and wishes to be more like them. His observation leads him to the conclusion that Earth must



respects, are one in reality." (Goodman, p. 121). The scientific knowledge he acquires through experimentation leads to the plot climax, finding God and uniting with him.

Ibn Tufayl even makes a quick stop at nutrition and biochemistry. "Nutrition

is metabolism. While this passage might seem normal, for those of us in the field of science, it is a basic statement of metabolic chemistry and biochemistry. If anything it shows the advanced scientific thought that Muslim physicians had.

be spherical. Isn't that astronomy? A revered science in Muslim tradition then, and a cutting-edge science now? That he mixes science and spirituality to find God is another example of the lurking theme of science that leads to spirituality.



I will never forget the look of protest on my students' faces when I entered the classroom. "This is not chemistry," one of them announced indignantly. "I know," I answered, "this is First-Year Seminar, and I am teaching it. See, the marriage between science and arts is an ancient one...."

One doesn't even need to look far into the text to find examples that can be related through a scientific lens. Science is present even at Hayy's birth. Ibn Tufayl relates two possible stories of how Hayy came to life. While both are deeply rooted in Islamic tradition – one that reflects the story of Moses and another that reflects the story of Adam – the latter can also be interpreted through a contemporary scientific lens. The question of how life began on Earth has received quite a bit of attention and study. Scientists from various disciplines have weighed in with a variety of explanations. I feel inclined to share with you the bioorganic view on this subject. Chemists argue that, although the first signs of life are forever lost, we can predict the types of reactions that led to the formation of life through fundamental chemical principles. In brief, it is hypothesised that life originated from small molecules that contain hydrogen, carbon, nitrogen, and oxygen, with the help of heat from the sun. The basic building blocks of life were formed, particularly molecules that now form our genetic code (DNA). Interestingly enough, clay's molecular make-up also contains these elements. Hayy's second birth story recounts that a small amount of clay combined with heat and moisture in the proper proportions and

perfect balance. "This fermented mass of clay was quite large, and parts of it were in better equilibrium than others, more suited than the rest for becoming human gametes...The clay laboured and churned, and in the viscous mass there formed what looked like bubbles in boiling water." (Goodman, p. 106). Although this story is inspired by the story of creation, if science can provide a molecular narrative to religion, then maybe religion and science are in harmony after all.

The question you are asking, I am sure, is, Why go through this much trouble to examine a religious philosophy text through a scientific lens? There are several reasons. First, teaching this text in modern-day Palestine for a student body that is mainly Muslim is a golden opportunity to enlighten young minds on the glory and advanced thought that Islamic civilisation had at the time. They were cutting edge. Second, it is necessary to connect contemporary scientific thought to philosophical thought. The connection of knowledge and reason leading to God is a necessary one, especially in this time when Islam seems to be going through a period of darkness and ignorance. Third, we (intellectuals) can perhaps finally have a mature and reasonable conversation about topics

covered in science classes that seem to render some people uncomfortable without the name-calling and the wrongful dismissal of teachers who dare to marvel at evolution as a divine process. Perhaps an examination of Muslim scientists' work can make Darwin seem less foreign, considering that modern evolutionary theory is a direct descendant of Al Jahiz's evolutionary theory. Fourth, maybe the lesson learned here is that science can lead to marvelling at God. Perhaps science can provide the practical reason for religious spirituality.

It was bittersweet to teach this text. Bitter because one wonders what happened to the Muslim world and how we regressed into darkness. How did we become more and more concerned with rituals and less with spirituality? How did we lose sight of Islam's message of knowledge and peace? Sweet because it was an opportunity to enlighten a generation who claims religiosity but whose knowledge is clearly weak. When I quoted verses from the Holy Qur'an, I often received blank stares in return, as though I were introducing a foreign language. I remember at some point stopping midway through a discussion and saying, "Maybe you should try studying your own religion and holy

scriptures before claiming that you know God. Perhaps more knowledge can lead to a better understanding of God (glory be to Him); indirectly this interjection is this course's theme, finding Truth; i.e., finding God must first occur through knowledge and then through love that leads to spirituality. On a personal level, this course has led to my own enlightenment. I felt that I was able to reclaim my religion as a scientist, as one who is often perceived to be bereft of wonder at God. It turns out that knowledge is what leads us to Him and what fuels marvelling at Him and His creation.

Riyam is a PhD chemist by training, a writer by passion. She is an assistant professor at Al Quds-Bard College, Al Quds University, Abu Dis, Palestine, and a mother of two. She teaches a variety of chemistry courses, First-Year Seminar, and Language and Thinking (an intensive writing and thinking course). Her basic chemistry research interest is in computer-based drug design. In her free time she makes homemade ice cream and cupcakes with the help of the tiny little hands of Basil and Taima. She is currently working on a food memoir that documents motherhood and food in Palestine. At the epicentre of her creativity is her husband and partner Ahmed.