

SEP | OCT 2022

THE

Fountain

On Life, Knowledge, and Belief

*With the winds of the fall
Some leaves have turned yellow
And some poplars have let them fall
While fools thought this would go on forever
Those who stand strong
are being praised from the beyond*

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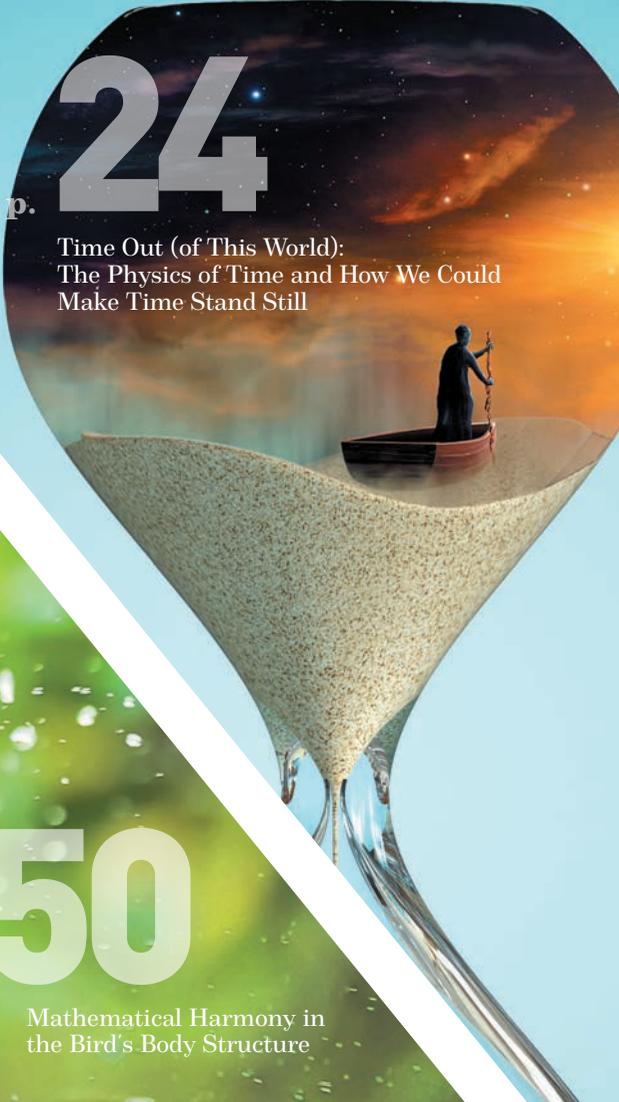
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How likely it is to be in a pub in one of remotest corners of the world and hear in an open mike session a poem on foundational questions about life from both scientific and philosophical perspectives? Not so likely. That's exactly what Kathleen V. Tatem did in an Irish pub in Hawai'i a few years back – looking into some of the deep questions like the direction of time through the language of physics, mathematics, and philosophy. Hers is a poem with Irish rhythms which heal the soul while stimulating minds with theories of physics and philosophy in order to serve as a bridge between polarized groups. Tatem has an educational background in physics and philosophy, and has recently founded Tatem Research Institute to continue her efforts to seek answers on foundational questions, to seek “what is beneath, the metaphysics within physics.” She suggests the poem should be read aloud, for it was “written to be heard.”

In this issue, our journey in science continues with Dr. Sumeyra Tosun, a professor of psychology from Medgar Evers College of CUNY in New York, who walks us through the Qur'an alongside scientific theory. As opposed to the “science or religion” camp, Tosun is for “science and religion,” for she believes – and convincingly argues in her article – that many verses of the Qur'an can be suitably read in line with the basics of scientific approach. She juxtaposes A. D. de Groot's empirical cycle (observation, induction, deduction, testing, evaluation) with a number of verses to show how God is in fact commanding each believer to be a scientist and explore His creation with an empirical investigation method.

Covid still continues to impact our lives. As schools are starting in the northern hemisphere, people are concerned about how their daily lives will be affected and how long this will last. Thankfully, we are not as unprepared as we were two years ago. Whether it will something like a flu in the future or transform into something with a major toll, one thing we should always remember is how so many healthcare workers courageously stood their position to take care of the sick during the pandemic. Lisa Villarroel, the Medical Director of the Division of Public Health Preparedness at the Arizona Department of Health Services and her brother, Matthew Jager, a public health writer, is telling about their share of tribulation during the pandemic in “A True Public Health Story.” We will forever owe to the authors and their colleagues for being there for all of us during the pandemic and other times. 

LEAD ARTICLE

by M.Fethullah Gülen

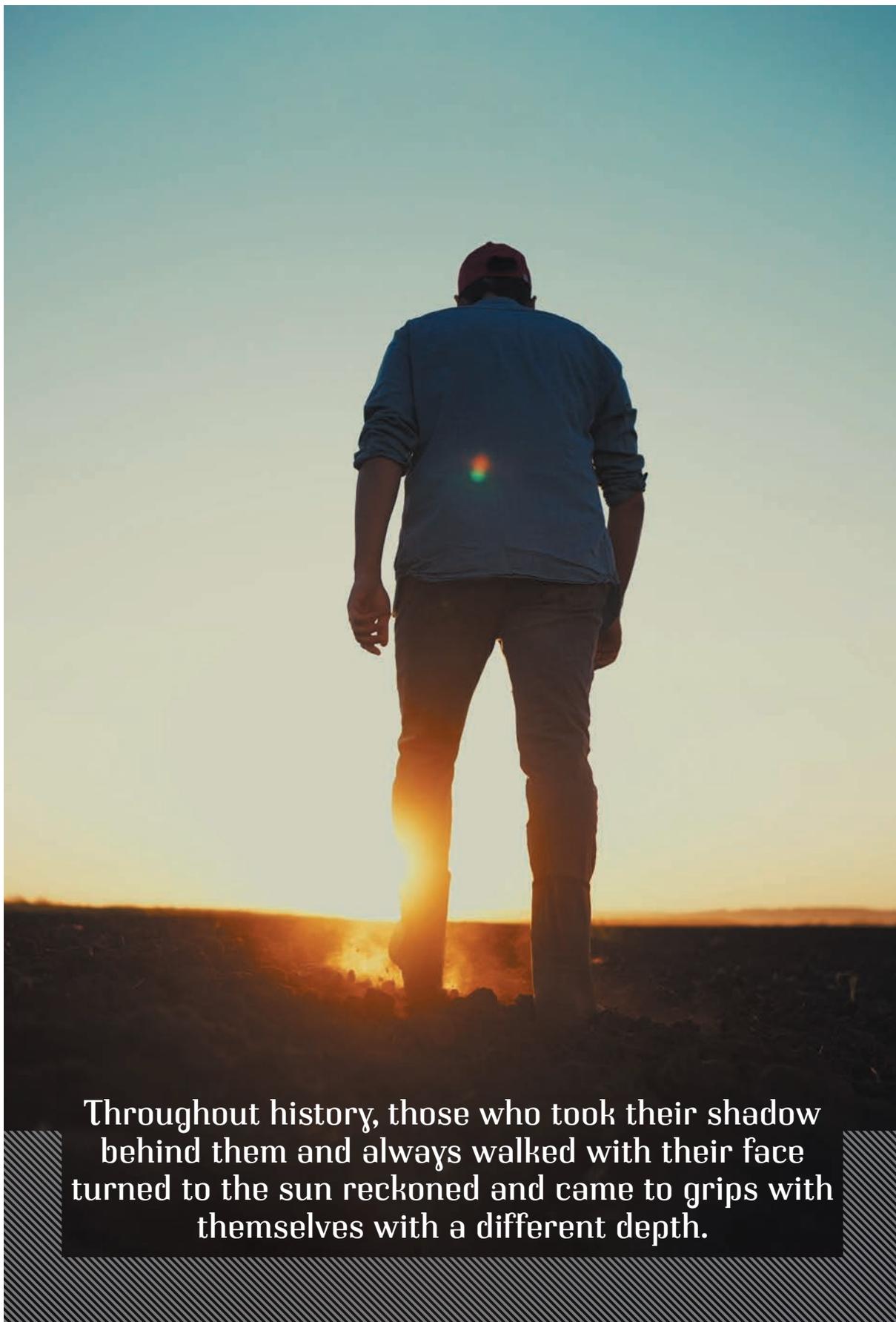
Embodiments of Rectitude



“Embodiments of rectitude are aware of the fact that they are mirrors to the Divine and that they are created as an index for all existence and worlds.”

There are some exemplary people who we may call “embodiments of rectitude.” These exceptional people look at life with a holistic view. They see things correctly, they think correctly, and they attach their every initiative with a consideration for truth. They move forward between the carnal soul and what lies beyond their nature always with this consideration in mind. They turn the lens of their willpower and consciousness to behold their inner world and check with their essential nature; then they turn it to beyond and further beyond and open up to the Creator. They give an account of their situation to Him, renew their covenant, and humbly prostrate themselves. They are aware of the fact that they are mirrors to the Divine and that they are created as an index for all existence and worlds.

With such an all-comprehensive awareness, these people always endeavor to act in accordance with the purpose of their creation and frequently supervise their inner worlds. They come to grips with themselves and keep vigilant against contamination of their considerations. They live with an alertness to not allow any darkening of the heart and rusting of the spirit. Most of the time, with a concern for having contaminated them, they run to purifying basins of turning to God, and they constantly sigh with the thought that they failed to give the due of the honor of being the best of creation.



Throughout history, those who took their shadow behind them and always walked with their face turned to the sun reckoned and came to grips with themselves with a different depth.

They never open the door of their imagination to any form of filth; let alone that, they shake like a leaf fearing the possibility of the least contamination of their dreams or conceptions and fog of stagnancy. In the face of such a possibility, they start seeking fresh means of turning to God. Their hands always on the knob of Divine mercy and forgiveness, they lead an angelic life. Given that they are heroes of closeness to God and are burning with a love for reunion with Him, then their way should be the lane of ardent longing for reunion with God. This should be the staircase of overcoming one's own remoteness and attaining togetherness beyond forms with Him Who is closer than the closest to us!

Those who did reach the horizons did so with such resolution and great effort; as for those entangled by the web of their fancies, however, they remained halfway on the road.

Throughout history, those who took their shadow behind them and always walked with their face turned to the sun reckoned and came to grips with themselves with a different depth. They trembled with concerns for falling on account of things they saw or assumed they saw in their hearts, spirit, conception, and imagination. As their feelings, excitement and worries were reflected in their words, they kept sighing and sincerely implored God Almighty.

From Prophet Muhammad the brilliant moon, peace be upon him, to the stars that gathered around his perfect guidance, all of the embodiments of rectitude have become loyal journeyers on the path of the Prophets leading to a reception with the Divine, and they have presented exemplary behaviors that will never misguide later generations who follow their footsteps. May their way be clear and may the All-Merciful Lord render us journeyers of that path, too!

Now, let us try to push a door to look at the example of Prophet Muhammad, peace be upon him, who is for us the unique vanguard of this road, the most distinguished and blessed guide of all time. Let us have a vista to see his example and come to grips with ourselves, with the acknowledgement that our own situation could only be that of a drop in the ocean.

The Prophet, the blessed master of the created and who had the utmost closeness to God, would open up to Him with an expansive state of his spirit, attitude of self-possession, and a consideration of guiding those behind him; and thus, his morning was a separate session of vigilance, and

his evening was a different time of turning to God. And he would pray as, "*Glorified are You, O God!*" And although sins did not visit him even in his dreams, he would say, "*I seek Your forgiveness for my sins, and I ask You for Your mercy.*" [1]

Thus, the Messenger of God would show the way to exercise self-supervision to his followers and present an astounding attitude of humbleness and effacement. Likewise, when daybreak drew near, his sincere petitioning was like a wake-up call for those who heedlessly indulged themselves in sleep and an admonition to the fluctuant. He would touch the doorknob of Divine mercy by beseeching as follows:

I seek refuge in You from wronging others and being wronged, from committing aggression and being the object of aggression, and from committing an error or committing a sin which is not forgiven. [2]

He did this even though these were miles and miles away from even entering his world of imagination. How I wish if only a quarter of this opening up to God were found within us and leaders of our nations.

Even before he was commissioned as a Prophet, and certainly after he was, at almost every phase of his blessed life he kept his carnal soul and fancies under control; in spite of this, he met every new sunrise with diamond words of supplication rising from his heart, in a manner of self-possession: "*My Lord, truly if you leave me to myself, You leave me to weakness I cannot bear, an overwhelming need, sin and error.*" After voicing his petition with these words of his vigilant soul, he would conclude his blessed appeal befitting him so well with the following expressions: "*Truly I rely on nothing except Your mercy, so forgive me all my sins, for no one forgives sins except You*" [3]. He prayed thus as if he ever had any sins!

He continued opening up to God and against the carnal soul and Satan, who could not even visit his world of imagination. He said the following, which I think was actually a way of giving counsel to his followers:

My God, I seek refuge in You from the evil of my self, the evil of Satan and his traps, and from committing wrong to myself or another Muslim. [4]

He would repeat these sincere sighs four times. Such a manifold degree of self-possession and de-

liberation! He would not suffice with these, holding the doorknob of mercy, Divine protection, and guardianship, he would pray as:

Ya Hayyu Ya Qayyum (O Giver of life and Who maintains it)! For the sake of Your Mercy, I beg for help. Rectify all my states of being and leave me not to myself even for the blinking of an eye! [5]

Let his example illuminate the blind eyes and deaf ears of those who stumble through their lives. He was so sensitive and vigilant against the carnal soul and fancies that even though he was miles away from them, they did not—could not—cast a shadow on his radiant world of thought. We take a step back again and once more give an ear to the deep sighs and petitioning of that sultan of speech: “I seek refuge in You from the evil of my soul and from the evil of every creature in Your grasp.” What vigilance! What an immense feeling of self-possession!

Even his archenemies did not, could not, dare ascribe the least degree of vice to him. Both before his mission as the Messenger of God and afterwards, he was acknowledged by all as the most trustworthy person. Yet, as if he had any shortcomings, he would pray, “O Allah! Conceal my imperfections and calm all my fears!” [6]. How exalted he is! He certainly did not have any shortcomings, but let us take this prayer as the guide’s counsel for us who need guidance.

In terms of his considerations of awe and reverence before Divine grandeur, he had a heart that always shook with fear of God. In this respect, he was marking the course leading to true virtue for those to follow his way. Saying that he would sleep at night like we do is gross disrespect against him, because he had settled this issue, too, by stating “my eyes do sleep, but my heart does not” [7]. However, even when that distinguished soul who surpassed angels was to enter his special sleep, he would earnestly turn to God wholeheartedly and say:

O God! in Your name have I laid down on my side. Forgive me my sins and drive away my devil; release me from my dependency (on others) and place me in the highest assembly! [8]

In spite of his much lauded and distinguished position, he was teaching so much to us even with that deep sigh. His Ascension to the heavens (*mi’raj*) was blessed with the gift of daily prayers (*salah*), and his prayers were each like a new As-

cension [9]. While he was heading to perform his prayers, which is like an earthly ascension, he would be imbued with perfect goodness (*ihsan*) in all of his attitudes; and when he started the worship at God’s beck and call, the following blessed words would come out of his lips as a beautiful expression of the deed being observed:

O God, You are the Owner, there is no deity other than You. You are my sole Lord, and I am your servant. I have wronged my soul; I confess my sin—[O dearest innocent soul, which sin are you talking about!—please forgive all of my sins; no one but You can forgive them. Guide me to good character, as only You can grant guidance! [10]

These prayers are meant to call us, too, to those horizons. May God also bless us with that complete guidance. His distance, from what he mentioned as “sin,” was further away from the distance between East and West, but against things he considered wrong—wrongs did not even visit his dreams—he opened up to God and moaned with utter self-possession and a vow of perfect goodness:

*O God, distance me from my misdeeds as You have distanced the East from the West!
O God, wash away my sins with pure water, snow, and hail! [11]*

What a profundity it is, my dearest beloved one! You are the one poets praised as:

*You are the glorified sultan of the Prophets, my master
You are a majestic bestowal to helpless ones, my master
You are the chief in the Divine Council, my master
You are the one affirmed by God’s swear by your life, my master. (Sheikh Galib)*

O the light of my endeavor and my shining sun, you are speaking in the first person and imploring God; yet, by doing so, if you are calling us to be ourselves on your blessed path, we have been alienated to those horizons with our degenerates and leaders. That being the case, our dreams are filled with hopes, and we are expecting your favor upon us; for the sake of God, do not make us wait further!

Just as you looked at those in your special circle, Please grant a look at this humble one also,

*And let me burn ablaze with your sacred love.
Let my atmosphere not be darkened with the
sadness of being without you,
Please say, "he is also from me," so that I do not
remain distant from you. (F. Gülen)*

We learned from you that prostration is the state when a person is closest to God [12].

*Where the head meets the feet, kissing the prayer
rug on the ground
Is the road that carries a person to closeness to
God. (F. Gülen)*

The Prophet used to put his head on the ground very humbly, his blessed head that never bowed before anyone other than the Almighty, and he would open up to God with different words and implored Him as follows:

My God, please forgive all of my sins [my innocent sultan of sultans, your Lord did not let you commit sins in the past, and with your loyalty He sealed all doors and windows to sin for you] [13]. O God, forgive me for all my sins, the greater and the minor, the first and the last, and the openly known and those kept secret! [14]

If only those who spend their lives in the filth of sins could also understand these moans and sighs loftier than breaths of angels! Unfortunately, those who said farewell to a life centered on realizing the heart's potential are unaware of the horizons of the spirit and will neither feel nor understand these sighs.

As he knelt down during his prayer (*tashahhud*) where he felt to the core his closeness to God and realized peak spiritual delight, he moaned again to the profundity of his own knowledge of God and showed how unreachable his spirit is with the following words from his heart, which are in fact meant to be reminders for unknowing ones like ourselves:

O God, truly I have greatly wronged my soul, and no one forgives sins except You, so forgive me with Your forgiveness, and have mercy on me, for You are the All-Forgiving, the All-Compassionate. [15]

If only we could also moan wholeheartedly for our lagging so far behind that guide, the Messenger of God who would always woe for certain

heart-darkening conditions, which might hold true for us any time and, yet, were so far away from his horizon:

O God, I take refuge in You from a hard heart, heedlessness, poverty, humiliation, and deprivation. I take refuge in You from want, unbelief, immorality, divisiveness, pretentiousness, and ostentation...[16]

I don't know whether such degree of vigilance and sobriety is ever felt by anyone else in such an astounding profundity. I do not think so and nobody else can deem it possible...

At the end of our discussed topic, which is like a drop from the ocean in terms of the Messenger's imploring and petitioning, I say, "the subject is not over, yet to be also covered are the purest souls from his circle. And I beg forgiveness from God on account of my mistakes..."

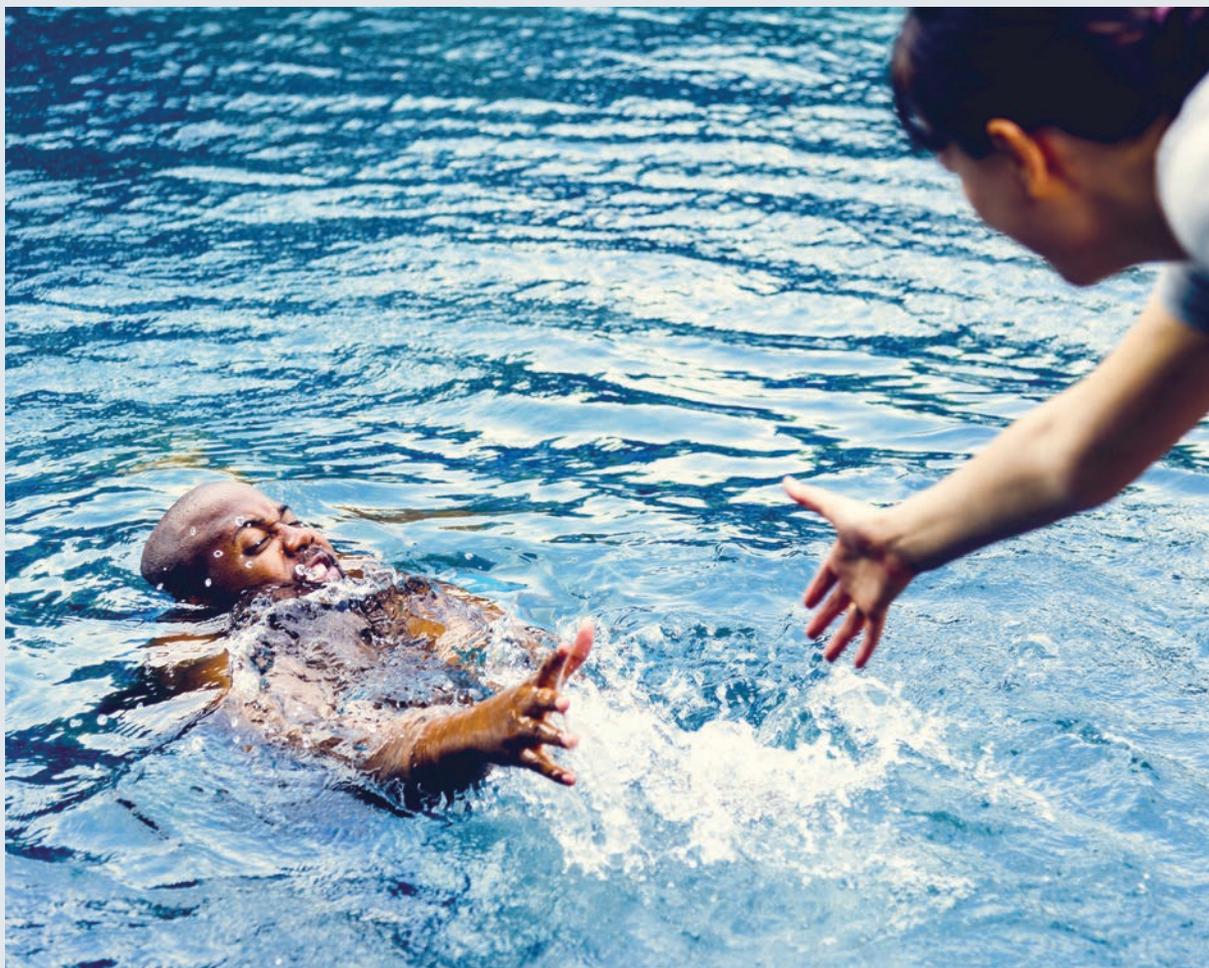
Notes

1. Abu Dawud, Adab 107.
2. Ahmad ibn Hanbal, al-Musnad 5/191; Tabarani, al-Mu'jamul-kabir 5/119.
3. Ahmad ibn Hanbal, al-Musnad 5/191; Tabarani, ad-Dua, p.122.
4. Tirmidhi, Daawat, 105, Ahmad ibn Hanbal, Al-Musnad, 2:171.
5. Abu Dawud, Adab 101; Ahmad ibn Hanbal, al-Musnad 5/42.
6. Abu Dawud, Adab, 100, Ahmad ibn Hanbal, Al-Musnad, 2:25.
7. Bukhari, tahajjud, 16, Tarawikh 1; Muslim, Salatu'l-Musafirin 125.
8. Abu Dawud, Adab 107; Tabarani, Mu'jamul-kabir 22/298.
9. One of the major miracles of Prophet Muhammad, peace be upon him, was his journey from Mecca to Jerusalem, and from there to the heavens. In this miraculous journey into heavenly dimensions, he met with other Prophets and eventually God. One of the gifts of this journey is daily prayers (*salah*), which Muslims are commanded to observe five times a day.
10. Muslim, salatu'l-musafirin 201; Abu Dawud, salat 124.
11. Bukhari, Adhan 89; Muslim, Masajid 147.
12. Muslim, Salat 215; Abu Dawud, salat 148; Nasai, mawaqit 35, tatbiq 78.
13. Fath 48:2.
14. Muslim, Salatu'l-musafirin 201; Abu Dawud, Salat 118; Tirmidhi, Daawat 32.
15. Bukhari, Adhan 151, Daawat 17, Tawhid 9; Muslim, Dhikr 48.
16. Ibn Hibban, *Sahih*, 3/300; Hakim, *al-Mustadrak*, 1/712.

A True Public Health Story

“Nearly 1 in three public health employees say they are considering leaving their organization within the next year ... More than half of public health employees report at least one symptom of post-traumatic stress disorder ... More than 9 in 10 employees say their work is important and they are determined to give their best effort every day.”

“Rising Stress and Burnout in Public Health,” March 2021



In public health, we tell the story of a farmer who lives at the foot of a waterfall. One day, while working her fields, she spots a man struggling in the river downstream. She throws a line to pull him to safety. By the time he makes it to shore, he is near death.

The farmer tells her neighbors, “We must keep a close watch to rescue others who are swept over the falls.” So they do.

Day after day, the farmer and her neighbors pull half-drowned people out of the water. They weave nets to cast across the river to catch the desperate swimmers. They keep blankets to warm them and medicines to nurse them back to health. When the water runs high and fast, they

post watchers further downstream to catch any who slipped past the lookouts.

Though the villagers save many lives, they cannot save them all. Their efforts leave them weary and worn, with little time to tend to their fields.

“We must try something new,” says the farmer. She climbs to the cliffs above the waterfall and, for some distance upstream, builds a fence along the water’s edge.

From that day forward, no more swimmers are swept over the falls.

The moral of the story, and our guiding principle in public health, is that it is better to save lives upstream than to chase bodies downstream.

I wake in a dead sweat.

Two years into my department's COVID-19 response. Two years standing waist-deep in rushing water, weaving nets and counting the dead.

I tell my husband for the third morning in a row that I can't do it any more. I tell him -- this, for the first time -- that I am going to quit the public health job I fought for and believed in and, once upon a time, loved.

The pandemic beat me.

Time to move on.

He talks me off the ledge, but I promise myself that if things don't get better, I will leave the department I thought would be my home for the rest of my career.

I'm scheduled today to give a presentation to a small group of first-year medical students. An hour before, my mom tells me to watch what I say. "Don't go off on your doom-and-gloom talk," she warns.

It's fine. I'll do it off the cuff.

"That's what I'm worried about," she says.

I put on my tweed blazer and log on. Twenty faces look back at me. The students smile and wave.

No teacher.

Am I going to run this session alone?

"What are we talking about today?"

Your life as a public health physician.

"And long is - how much time do I have?"

Ninety minutes.

"Um. Do you have questions for me?"

No.

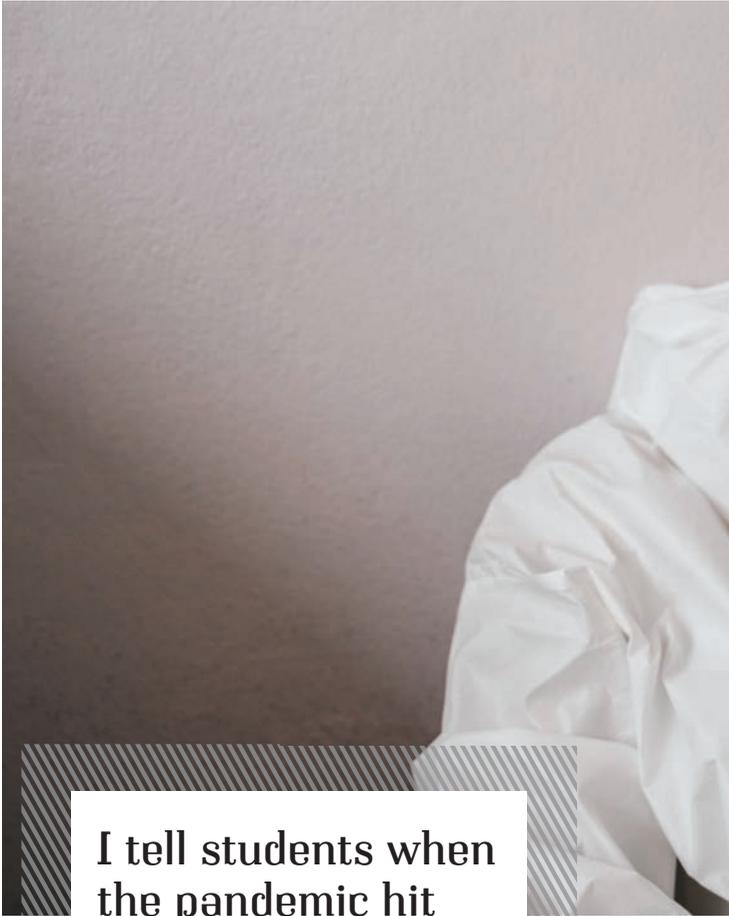
According to my business card, I am the Medical Director of Public Health Preparedness. "Well," I say, "I am prepared for this --" but I'm not, obviously -- "and now it is the time to talk about my career."

I tell them that my department started the pandemic with a skeleton crew. We've operated for years in a hiring freeze, which means that any time we lose someone, their job responsibilities get distributed to one of us who stayed behind.

I tell them when the pandemic hit we worked seven days a week for the first year. Six days a week the second year. And we're hemorrhaging employees to better-funded health departments, to retirement pensions, to the private sector, to death.

The students are staring at me.

Oh God, I thought. This is exactly what Mom told me not to do.



I tell students when the pandemic hit we worked seven days a week for the first year. Six days a week the second year. And we're hemorrhaging employees to better-funded health departments, to retirement pensions, to the private sector, to death. The students are staring at me.



But I can't stop.

So I tell them about in the early days of the pandemic when we killed ourselves trying to build the fences upstream -- distancing, masking, quarantining -- and were stymied at every turn.

I tell them about the downstream work I've been doing now that the fences at the top of the cliff got scrapped. I tell them how it brutalizes the public health soul to spend the whole pandemic casting nets to catch broken bodies that have already been swept over the waterfall.

I tell them how, at first, the members of our emergency operations center took turns waiting for the bathroom to cry. How it got easier when we went remote because you could crawl under the covers between calls.

I tell them this is what happens when you blow through a career's worth of passion in a single year. I thought it couldn't happen to me but it did.

After, like, 89 minutes, I stop for questions.

One student raises his hand and thanks me for coming. He announces he never, ever wants to join public health.

It breaks my heart, but I try to laugh it off.

I tell him I feel that way too sometimes. This job gets you hooked on the possibility, however remote, that you can help make things better in a big way. I reminisce about our mass vaccine sites, which I describe as "an eighth wonder of the world." I tell them about the surveillance systems we designed and built from scratch. About knitting our patchworked hospital systems together so they function as one.

And I end by telling the students that even if none of them go into public health, they can still help us work toward large-scale change. Every jurisdiction -- state, county, tribal -- relies on brilliant, community-driven physicians for ideas and expertise on the next public health threat.

So that's it.

Afterwards I call my supervisor and tell her I shouldn't be talking to medical students any more. "Maybe I should just quit," I say, pretending it's a joke. She gives me a sidelong look, not laughing.

And then there's something in my inbox from one of the medical students. He thanks me for my talk. Says it reminded him of why he's in medical school in the first place: to tackle huge problems, broker meaningful partnerships, help the vulnerable. He says after my talk he's going to go into public health.

Well, I broke even. Lost one, got one.

A couple weeks later, my supervisor tells me she's putting in her notice. She got an offer from the private sector that promised her resources for upstream work.

What can I say?

I want to tell her about the bottomless love I feel for her and everyone on our team, the ones who have been in it together from the beginning -- the ones who have blown through their breaking points time after time but somehow still keep the faith.

Instead I tell her I understand. That the fight won't be the same without her.

And then, like true believers, we start talking about plans for new fences to pitch upstream.

Reference

De Beaumont. Rising stress and burnout in public health: Results of a national survey of the public health workforce stress and burnout. March 2022 (https://debeaumont.org/wp-content/uploads/dlm_uploads/2022/03/Stress-and-Burnout-Brief_final.pdf).

PERSPECTIVES

by Sumeyra Tosun



The Qur'an Made Me a

Scientist

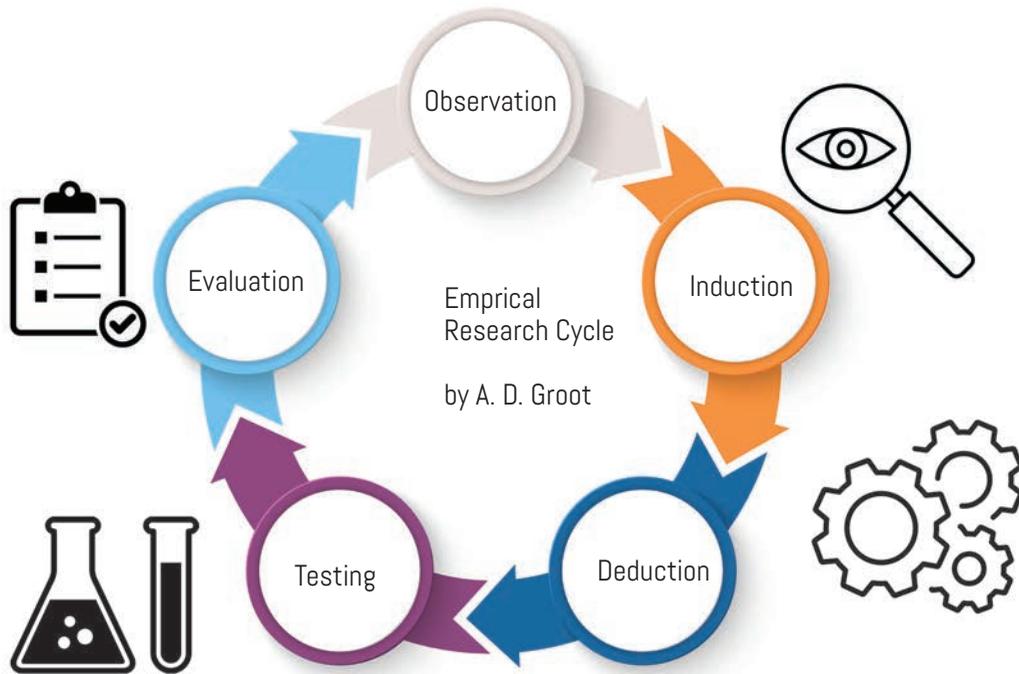


“Many of my friends ask me how I can deal with the two conflicting worldviews (religion and science) and whether one of them negatively influences the other. I tell them, to the contrary, my religion asks one to be a scientist.”

I am a cognitive neuroscientist experimenting on human cognition while learning and using language. In short, I am a psycholinguist. I am also a religious person who believes and follows Islamic tradition. Many of my friends ask me how I can deal with the two conflicting worldviews and whether one of them negatively influences the other. I tell them, to the contrary, my religion asks one to be a scientist and examine the universe in every aspect. I would even argue that God expects all humans to be scientists.

For epistemic inquiries and gathering knowledge, religions are believed to follow only holy revelations while science follows empirical investigations. Thus, religions and science have long been considered contradictory. Religious people are commonly considered mindless blind devotees who believe and apply whatever is told to them by divine revelation. On the other hand, scientists are seen as mindful investigators who test and experiment their knowledge before accepting and applying it.

History records quite a high number of religious individuals who have also been pioneers in different scientific fields. The main purpose of this article is not to list all these names, but to discuss the standpoint of God towards scientific research methods for building a body of knowledge about the universe from the Islamic perspective. I will be describing the main principles of the scientific method to reach the truest knowledge, vis-à-vis principles stipulated by God as mentioned in various Qur'anic verses.



Empirical investigation

For scientists, the method of finding true knowledge is empirical investigations. The term “empirical” originated from ancient Greek medical practitioners who refused to use the dogmatic doctrines. Instead, they preferred to rely on their observations and experiences. Empirical investigations in science are known as knowledge collection methods. They only rely on observable and testable data gathered by senses followed by arriving at mindful conclusions based on the collected data. In the same vein, one of the first orders of God in the Qur’an is to avoid dogmatic and untested knowledge and presumptions, as is seen in the following verses:

“...they respond: ‘No, but we follow that (the traditions, customs, beliefs, and practices) which we found our forefathers in.’ What, even if their forefathers had no understanding of anything, and were not rightly guided?” (2:170) [1]

“They have no knowledge of this. They follow nothing other than conjecture, and conjecture can never substitute for anything of the truth.” (53:28) [2]

The Qur’an also strongly emphasizes the importance of gaining and gathering knowledge:

“[always] say: ‘My Lord, increase me in knowledge!’” (20:114)

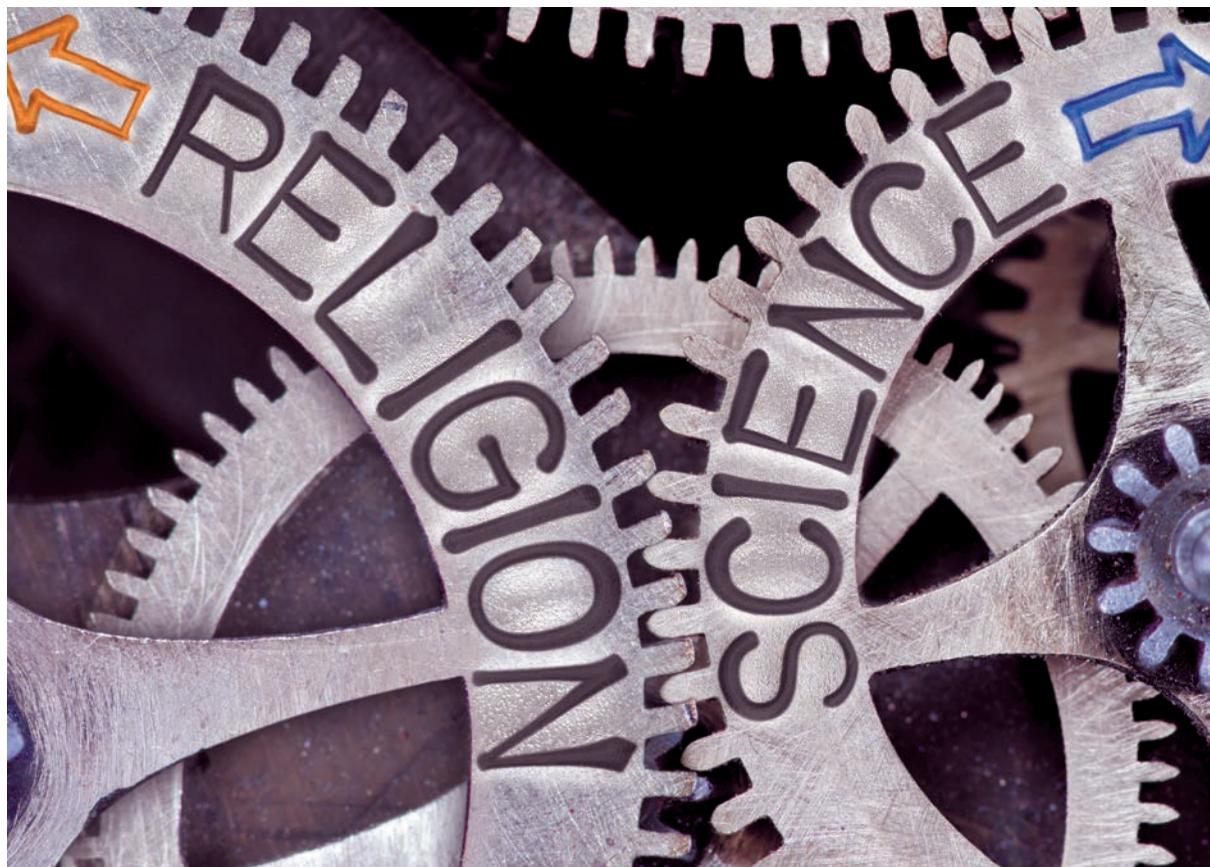
“Say: ‘Are they ever equal, those who know and those who do not know?’ Only the people of discernment will reflect and be mindful!” (39:9).

Furthermore, the Qur’an orders believers to use the mind and senses to gather knowledge and arrive at a conclusion:

“They have hearts with which they do not seek the essence of matters to grasp the truth, and they have eyes with which they do not see, and they have ears with which they do not hear. They are like cattle—rather, even more astray. Those are the unmindful and heedless!” (7: 179) [3]

“Indeed the worst kind of all living creatures in God’s sight are the deaf and dumb, who do not reason and understand.” (8:22)

Even more specifically God asks us to direct our attention towards the sky and earth (3:190-191, 10:101, 15:16, 30:50, 45:13, 50:6, 88:18, 88:20), stars (37:88), the alternation of night and day (23:80), the origin of creation (29:20), the history / stories of the past (3:137, 6:11, 16:36, 27:69, 30:9, 30:42, 35:44, 40:21, 47:10), the sources of food/nutrition (80:24), the material of creation (86:5), clouds pregnant with water, camels, (88:17), mountains (88:19), and ripening fruit (6:99) as some of the examples to observe and examine. He frequently reminds us to use our reason and mind (“Will you not, then, use your



The steps of the empirical cycle can be clearly traced in the Qur'an. Many verses order us to observe the universe. Once gathering our observations and data together, God suggests us to examine all the statements and follow the best one.

reason?" (28:60)) [4] and suggests that we need to come up with empirical evidence to support our hypothesis ("Produce your proof if you are truthful (in and convinced of your claim)!" (2:111)). Thus, producing knowledge by empirical investigations is what God suggests or even orders. As the next step, let us understand the empirical cycle.

Empirical cycle

The empirical research cycle was suggested by A. D. de Groot. This cycle consists of five equally important phases.

1) *Observation*: Observation is the first step to start a scientific inquiry. When scientists come up with a research idea, they propose a hypothesis, an educated guess. During this step, data is collected through observation.

2) *Induction*: Inductive reasoning is then applied to the data of many observations to form a general conclusion. This general statement is used to summarize a general law that can explain various observations.

3) *Deduction*: This step helps scientists to create different hypotheses related to the first idea based on the previously accepted law. These ad-

While reading the Qur'an to learn about worship and spirituality, I realized that God requires all believers to examine the universe, from the smallest to the largest creatures, by applying a systematic empirical method of investigation.

ditional hypotheses are stated based on logic and rationality.

4) *Testing*: This step is to return to empirical methods to the stated hypotheses created in the deduction phase. Scientists collect new data and use statistical analysis to test whether the new observations support the hypothesis.

5) *Evaluation*: This step requires a detailed evaluation about the findings. Scientists need to put forth their data, the supported hypothesis, and their conclusion. They need to discuss the limitations of the testing process and alternative explanations for the findings. At this step, one of the most important rules that every scientist must follow is parsimony, aka Occam's razor. This rule states that among all possible explanations of the truth, the simplest one should be accepted.

As the cycle continues the findings are replicated and retested numerous times and turned into robust findings or generally accepted facts. When most facts are discovered, they establish theories which are the laws that explain the complex formations of the universe.

The steps of the empirical cycle can be clearly traced in the Qur'an. I already discussed the verses that order us to use our eyes and to observe the universe in the previous section. Once gathering our observations and data together, God suggests us to examine all the statements and follow the best one: "Who, when they hear speech, follow the best of it (in the best way possible, and even seek what is better and straighter). Those are the ones whom God has guided, and those are the ones who are people of discernment." (39:18). This verse suggests we use inductive reasoning as examining all possible explanations and induce the best explanation.

Out of the best explanation, we need to deduce individual hypotheses using logical and rational thinking. As mentioned above (also see footnote 4), the Qur'an frequently asks us to use our reason

and mind ("Will you not, then, use your reason? (28:60)) to apply deductive reasoning.

The next step is hypothesis testing. The Qur'an provides us a great example of how hypothesis testing works in the verses about Joseph and the woman (the master's wife):

"And the woman in whose house he was living sought to enjoy herself by him. She bolted the doors and said, 'Come, please!' He said: 'God forbid! My lord (your husband) has given me honorable, good lodging. Assuredly, wrongdoers never prosper.' (12:23)

"So they raced to the door, and she tore his shirt from the back, and they met her master (husband) by the door. She cried: 'What should be the recompense for him who purposes evil against your household—except imprisonment or a grievous punishment?'

"He (Joseph) said: 'She it was who sought to enjoy herself by me.' And one of those present, a member of her household, said: 'If his shirt has been torn from the front, she is telling the truth, and he is a liar. But if it is torn from the back, then she is lying, and he is truthful.' So when he (her husband) saw that his shirt was torn from the back, he (turned to his wife and) said: 'This is from the guile of you women; for sure your guile is great.'" (12: 25-28).

In short, party 1 (the woman) accuses party 2 (Joseph) of wishing to do harm/evil to her, and party 2 denies this. This story suggests we deduce a logical, reasonable, and testable hypothesis to arrive at a conclusion. This hypothesis is of the format "if A is X then B is Y" which uses the observable to decide the unobservable. It is very important to note here that the expert witness has stated the two hypotheses as the decision rule and the judgment criteria, prior to seeing the shirt; thus, the conclusion will be objective.

The last step in the cycle is evaluation—ordered in the Qur'an as self-evaluation: “Read your book! Your own self suffices you this day as a reckoner against you!” (17:14). As a scientist we have to evaluate our results, criticize ourselves and declare our limitations during the investigation (“And do not conceal what you have witnessed” (2:283)). In this evaluation process, for the sake of parsimony, if the results allow more than one explanation, we need to choose the simplest one, as is also stated by God: “God does not will to impose any hardship upon you, but wills to purify you” (5:6); and “God wills ease for you, and He does not will hardship for you” (2:185).

Once we gather knowledge, before and/or after announcing (publishing) it, we have to replicate the findings. We need to make sure that the same situation in the same environment consistently reveals the same results. We are also warned by God to verify the truth before giving credence to any reports: “If some transgressor brings you news (that requires taking action), verify it carefully (before you believe and act upon it)” (49:6); “Do not follow that of which you have no knowledge (whether it is good or bad), and refrain from groundless assertions and conjectures. Surely the hearing, the sight, and the heart—each of these is subject to questioning about it” (17:36).

When our results turn to robust findings that are largely accepted, then we use inductive reasoning again to figure out the broader explanations of findings like ours. This process is the theory-building process which often leads us to discover the laws of the universe. This is the ultimate goal for all scientists and individuals who follow God's order: “Surely, We have created each and every thing by (precise) measure” (54:49); “He who creates everything and determines its nature in accordance with a design (25:2)”; and “...who creates [everything], and thereupon forms it in accordance with what it is meant to be, and who determines the nature [of all that exists], and thereupon guides it [towards its fulfillment]” (87: 2-3).

Ethics in empirical investigations

As a psycholinguist who conducts experiments on human beings, ethical procedures are equally important, ensuring we follow the rules and regulations of the empirical cycle. The history of psychological research is full of examples that violate ethical principles and the rights of subjects. Thus, in 1979, the Belmont Report was published as a regulation for the rights of human subjects. It de-

finied the three ethical principles that now guide studies with human subjects in the U.S.

1) *Respect for persons*: “Respect for persons incorporates at least two ethical convictions: first, that individuals should be treated as autonomous agents, and second, that persons with diminished autonomy are entitled to protection.”

2) *Beneficence*: “Two general rules have been formulated as complementary expressions of beneficent actions in this sense: (1) do not harm and (2) maximize possible benefits and minimize possible harms.”

3) *Justice*: “An injustice occurs when some benefit to which a person is entitled is denied without good reason or when some burden is imposed unduly...”

God ordered us to follow these ethical principles centuries ago:

1) *Respect for persons*: “Assuredly We have honored the children of Adam.” (17:70)

2) *Beneficence*: “...do not ruin yourselves by your own hands, do it in the best way in the awareness that God sees it. Surely God loves those who are devoted to doing good.” (2:195)

3) *Justice*: “...blame attaches but to those who oppress [other] people and behave outrageously on earth, offending against all right: for them there is grievous suffering in store!” (42:42)

Conclusion

While reading the Qur'an to learn about worship and spirituality, I also realized that God requires all believers to become scientists and to examine the universe, from the smallest to the largest creatures, by applying a systematic empirical method of investigation. Thus, there is nothing contradictory between science and religion. By saying this, I do not mean that every believer should be in a lab and experiment on physics, chemistry, genetics, or psychology. Instead, believers should follow the empirical investigation method, whether at work, while cooking, fixing a car, dealing with friends, raising kids, exercising at the gym, shopping, and so on. It is the lifestyle that God suggests to us as the best.

Notes

1. All cited Qur'an verses are taken from the Qur'an by Ali Unal.
2. For similar verses: 10: 78, 43: 22-23, 7:28, 6:116, 6:148, 10:36, 10:66, 45:24
3. For similar verses: 25:44
4. The verses that suggest using one's reason: 2:164, 2:242, 3:118, 5:58, 6:83, 6:151, 7:169, 8:22, 10:42, 10:100, 21:67, 28:60, 29:35, 30:24, 30:28, 36:62, 37:138, 40:67, 49:4

Adverse Childhood Experiences (ACEs)

and Their Lifelong Impact



“Adverse childhood experiences (ACEs) can have a tremendous impact on future violence victimization and perpetration, as well as impacts on lifelong health and opportunity.”

During one of my on-call shifts as a chaplain, I encountered an 18-year-old female patient who was brought into the hospital due to a suicide attempt. She was in distress. I introduced myself as chaplain, and I told her that I could provide emotional support without making any judgments. I operated primarily through empathetic reflections and unconditional positive reinforcement. She expressed her fears, stressors, and why she wanted to die. She told me that when she was five years old, she was sexually abused by her biological father. She was traumatized and had been experiencing fear since she heard that he was released from jail. She said that this distress and fear led to her suicide attempt. I was able to provide emotional support through active listening, validation, and normalization of her feelings.



Stress is not always unhealthy. Stress can encourage healthy growth. However, exposure to childhood traumas included in the ACE study can result in stress that becomes chronic, and changes can occur in the developing brain and body.

In reflection, this case drew my attention to the importance of awareness about adverse childhood experiences. It is very important for a peaceful society to have individuals who are spiritually and physically healthy. In 2019, research was published in the US by the Centers for Disease Control and Prevention (CDC), the national public health agency of the United States, regarding trauma exposure during childhood. According to the CDC, adverse childhood experiences (ACEs) can have a tremendous impact on future violence victimization and perpetration, as well as impacts on lifelong health and opportunity. ACEs are one of the major public health problems that result in long-term mental and physical health problems. 1 in 6 adults have experienced four or more types of ACEs. Females and certain racial/ethnic minority groups, such as African Americans and Hispanics, are at greater risk of experiencing 4 or more ACEs. At least 5 of the top 10 leading causes of death are associated with ACEs.

As we have seen in scientific studies on brain development, most human brains take about 23-25 years to develop, though these rates can vary between men and women and among individuals. However, the formative ages between 0 to 16 matter a lot for brain development. The amygdala, which is part of the medial temporal lobe, plays an outstanding role in mediating many aspects of emotional learning and behavior. It is responsible for the response and memory of emotions, especially fear. The effects of trauma, early life stress, or ACEs on the developing brain alter the amygdala and the structure of certain brain regions. If a human being is exposed to fearful activities or threats, the amygdala automatically responds to threatening or dangerous stimuli. It is a kind of defense and coping mechanism. These threats create toxic stress and affect the amygdala and other brain functions.

Stress is not always unhealthy. Stress can encourage healthy growth. However, exposure to childhood traumas included in the ACE study can result in stress that becomes chronic, and changes can occur in the developing brain and body [1].

Adverse childhood experiences such as neglect, abuse, household dysfunction, terror, and war create fear and toxic stress which are not good for the amygdala and other brain functions.

A large proportion of adults (61%) reported trauma exposure during their childhood ages [2]. According to the CDC, 61% of adults had at least one ACE and 16% had 4 or more ACEs. Many people do not realize that exposure to ACEs is associated with an increased risk of health problems across one's lifespan, including diabetes, cardiovascular disease, obstructive pulmonary disease, obesity, cancer, asthma, and depression.

Various studies have shown there are measured relationships between specific ACEs and diabetes. After combining data from four UK studies, it was found that, compared with adults with no ACEs, those with 2-3 ACEs had a 1.3 times greater risk of type 2 diabetes—and those with 4+ ACEs had a 2.1 times greater risk [3].

One major group of people that go through a specific trauma is immigrants, especially refugee children. Currently, there is an ongoing war between Ukraine and Russia, and there are still refugees fleeing Middle Eastern countries damaged by war and dictatorial regimes. Fearing arrest, torture, or even death, many people have fled the safety of their homes. In these conflicts, many people—including children—lost their loved ones or were physically injured. They were forced to migrate and flee their homes and their schools. These traumatic incidents are very vivid, and many victims struggle to cope with these tragic events. Integrating into new places, such as refugee camps or shelters, is not easy. Some children lost their family members while they were fleeing.

Zeynep, the daughter of one of my close friends, was just a baby when she spent 16 months in prison with her mother. When her mother was finally released under judicial control, her father got arrested. She could spend only 27 days with both parents. I still remember how, outside of a courthouse, she approached a dog and asked, "Hey, dog, where is my mom?" Unable to make her voice heard by people, she tried to be heard by a dog.



Such traumas irrevocably shape the way a child's mind will form—and potentially lead to life-long health problems.

Many victims of war and human rights violations (HRVs) experience feelings of insecurity, fear, and grief, as well as intense resentment and anger. Their senses of identity, meaning, values, worldview, coping styles, and social functioning are often affected. When forced migration adds to the multiple pre-flight losses and traumatic experiences of many refugees, the challenges of acculturation, ongoing worries, and hardships in the post-migration phase may increase the severity of symptoms and suffering. The cumulative burden of pre-flight, flight, and post-flight experiences is reflected in the complex symptom patterns and comorbidities found among refugee patients in health care settings [4].

In light of these studies, intellectual people, journalists, civic and religious leaders, politicians, and NGOs must take immediate action to prevent adverse childhood experiences (ACEs) and trauma exposure such as war, terror, poverty, hunger, abuse, household dysfunction, and human rights violations.

Clearly, the prevention of ACEs is a challenge, but clinicians, teachers, caseworkers, community leaders, and spiritual counselors also have an important role to play. There are actions clinicians can take in their practices that may help prevent ACEs and reduce the harms associated with expo-

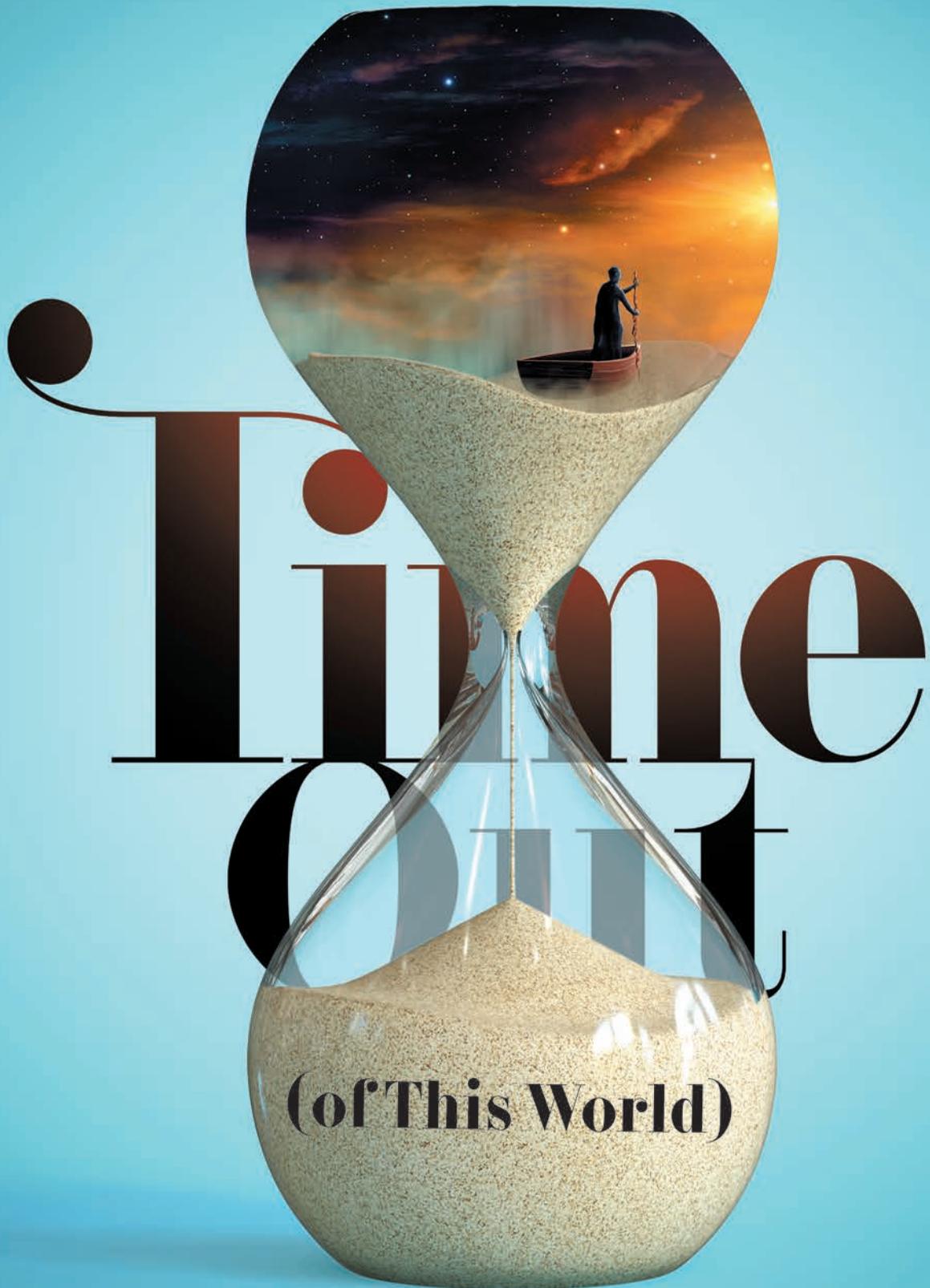
sure to ACEs. It is essential that professionals and volunteers become educated about and recognize ACEs and learn strategies for the prevention of ACEs—and caring for patients who have experienced ACEs. Community centers, social support groups, and government agencies also have an important role in providing spiritual, emotional, financial, and educational support to victims who have experienced ACEs. Mentoring programs, after-school programs, and high-quality childcare could be helpful for victimized children. Connecting youth to caring adults helps to ensure safe, stable, nurturing relationships as well as mitigating the immediate and long-term physical, mental, and behavioral consequences of ACEs.

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■ POEM

by Kathleen V. Tatem



Time

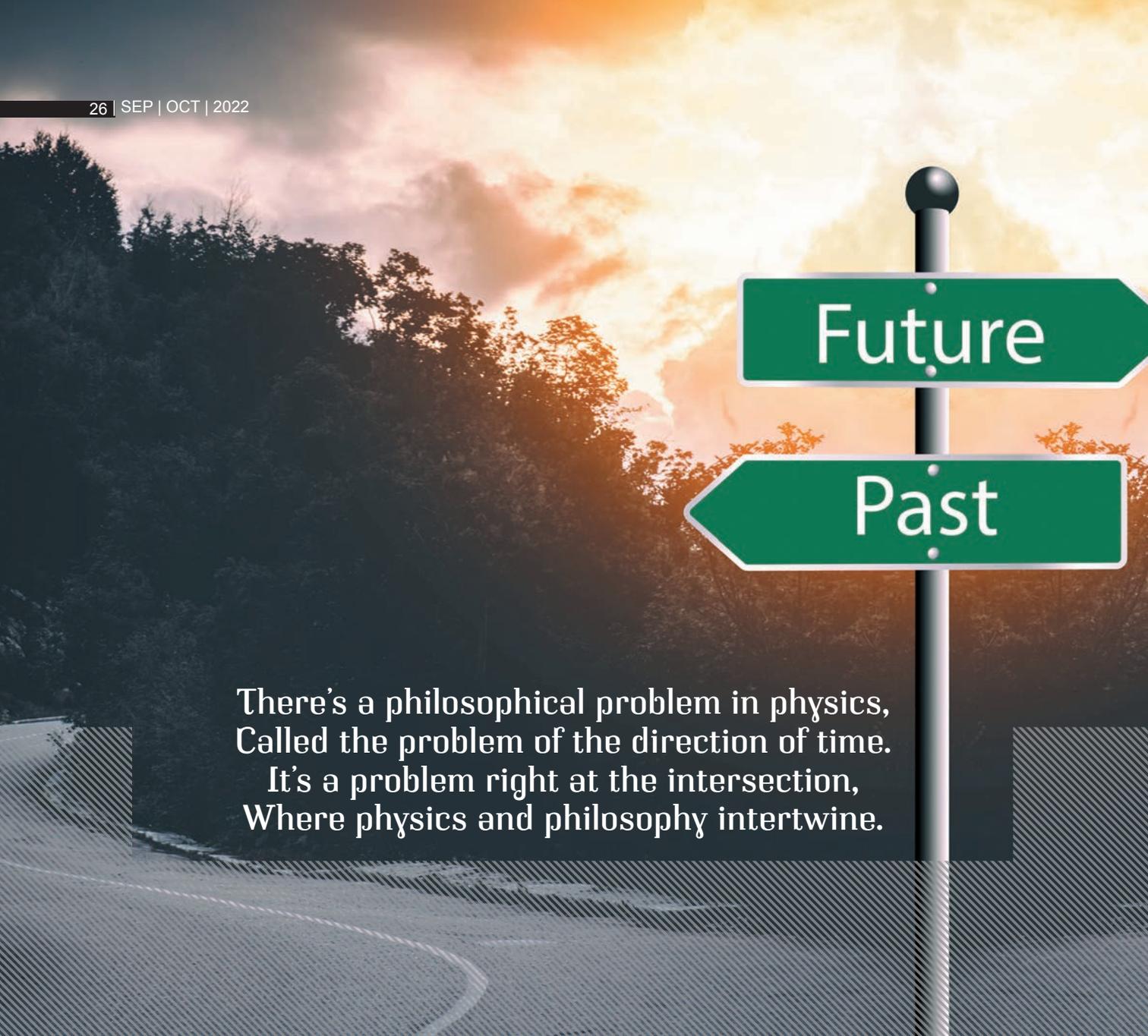
Count

(of This World)

The Physics of Time and How We Could Make Time Stand Still

“What is the physical origin of the direction of time? A philosophical question, But one that future experiments could decide.”

As the foundations of physics becomes a specialization in philosophy and an interest of primarily theoretical rather than experimental physicists, experimental physics can have impacts in foundational questions that go unnoticed. This poem summarizes a thesis that bridges the gap between experimentalists and philosophers, showcasing a line of inquiry in the debate on the origin of the direction of time that is improved when in dialogue with experiment. First performed in Anna O'Brien's Irish pub in Honolulu in 2017 amidst public movements to protect Hawaiian sovereign lands from astronomy development, this narrative poem was inspired by Celtic rhyming traditions which stimulate community healing. As conflict swelled within and between the humanities, sciences, and the public in Hawai'i, this poem was designed to engage and equipoise polarized groups. Announcing the abundance of physical possibilities, alternative physics theories and philosophical interpretations, and unappreciated existing knowledge, this poem created a brief pause, a chance to imagine unanticipated outcomes. Read it out loud; it was written to be heard:



Future

Past

There's a philosophical problem in physics,
Called the problem of the direction of time.
It's a problem right at the intersection,
Where physics and philosophy intertwine.

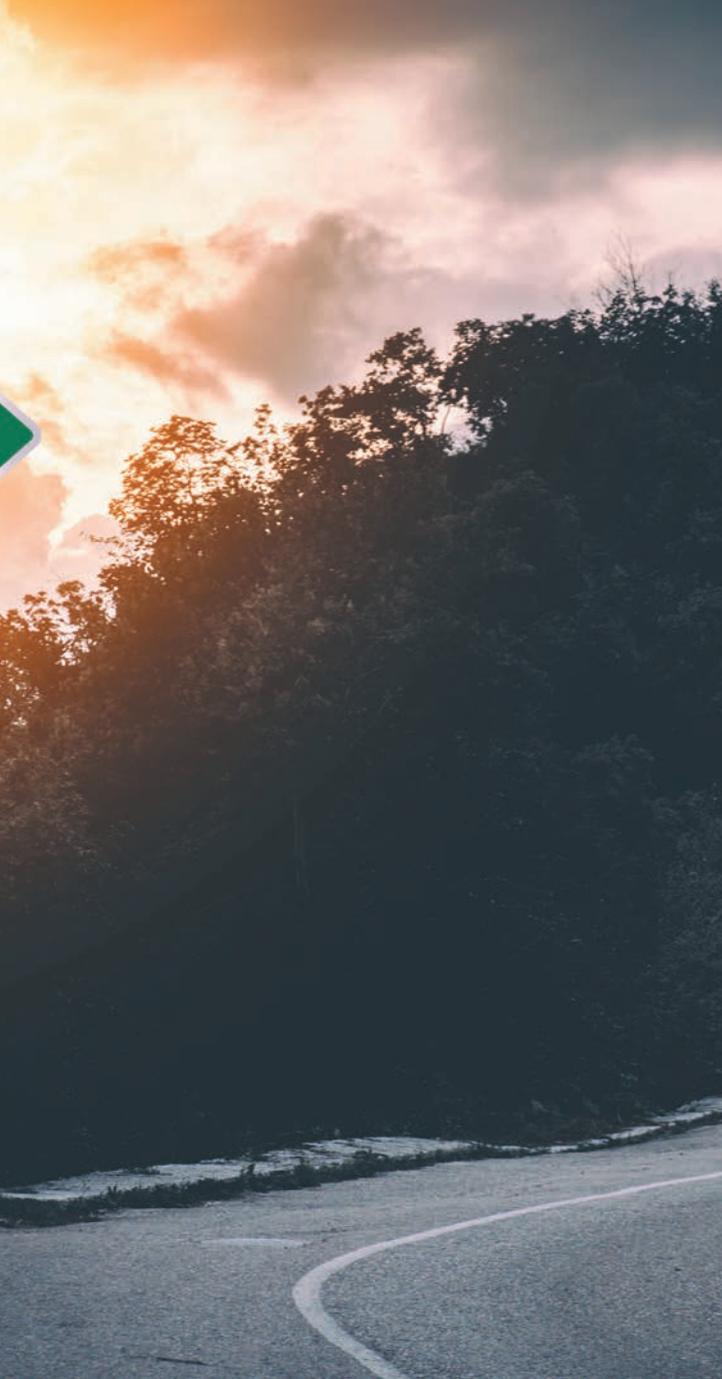
Strange,
Isn't it?
If you start to
Think about it.
What are we, really?
What's the fundamental nature
Of our experience?
Physics makes the mundane strange,
Makes everyday occurrences
Mysterious.

What hidden regularities,
Lie within our reach?
What are the patterns of nature?
What mathematics do we need?

A mathematical model of the universe,
That's what physicists seek.

But as a philosopher,
I'm interested in what's beneath,
The metaphysics within physics,
That is what *I* seek,
To read between the lines of the mathematics,
To have a metaphysical explanation,
Not just a useful mathematical equation.

There's a philosophical problem in physics,
Called the problem of the direction of time.
It's a problem right at the intersection,
Where physics and philosophy intertwine.



My goal tonight is to argue,
That this debate is something experiment can
help decide,
And that if one idea is correct,
Then for an isolated system, we can stop time.

I'll first describe the problem,
And then some proposed solutions,
Followed by a result from a recent physics paper,
And use it to argue how those solutions can be
disproven.

Now consider, for example,
The mechanics of Newton.
To find the trajectories of objects,

A spatial coordinate system must be chosen.
Given the initial conditions,
Meaning the initial velocities and positions,
Of all the particles composing the system,
You know the whole trajectory,
The whole future, the whole history.
Use time as the variable,
And the positions of all particles at all times can be
known with certainty.

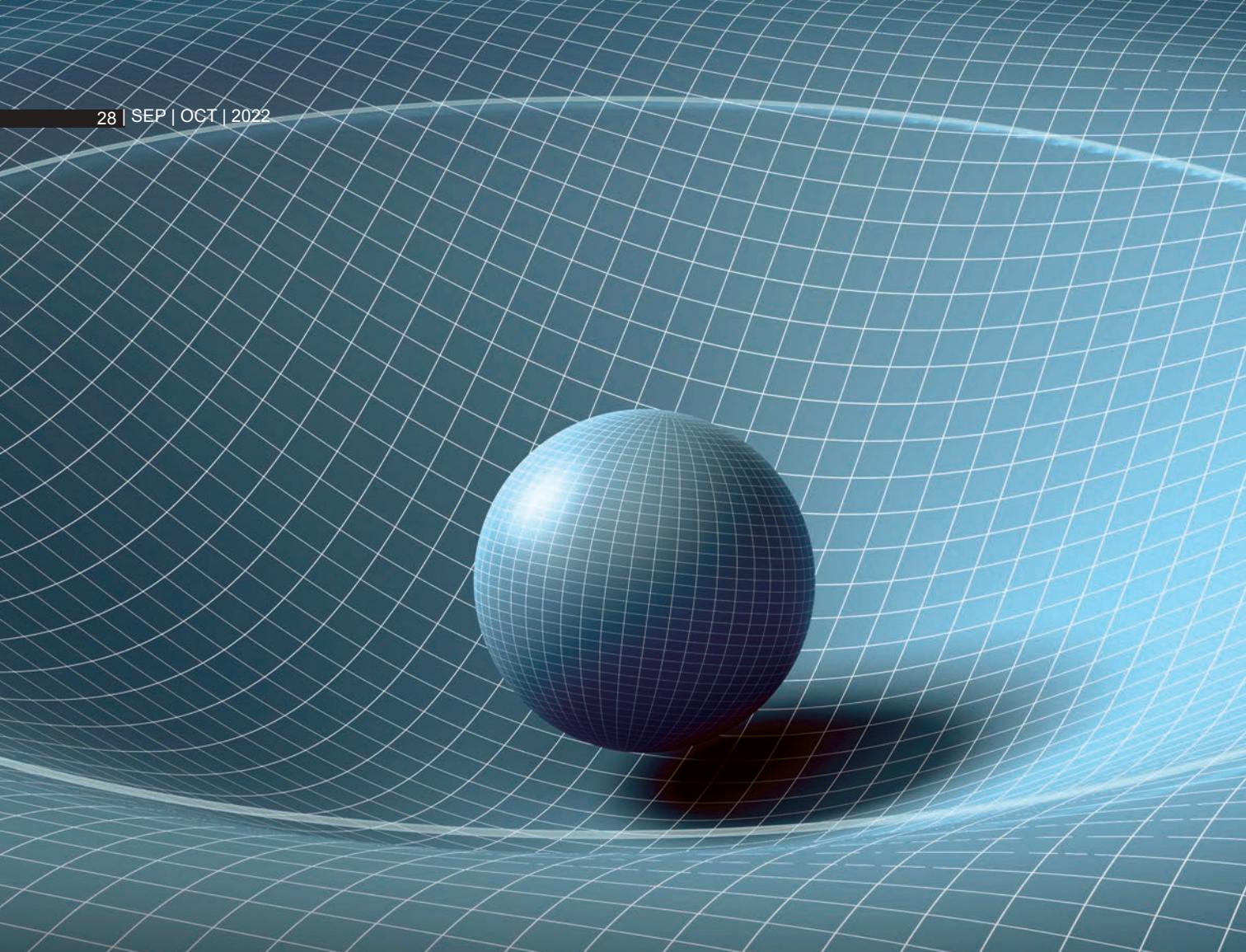
Now certainly, you know this only works in theory,
Because really,
We don't know the initial conditions
For a single spec of dust in this room,
Better yet for the entire universe in its entirety,
Better yet microscopically,
Which is what we'd really need to do,
If we wanted to reverse a physical system.

Microscopically, there is reversibility.
This is what we call time-symmetry.
Just plug in "minus t,"
Just a negative value of time,
Into the equations of motion.
It reverses the direction of the velocity,
And you get the exact reverse trajectory.
Each particle will end up where it began,
Exactly where you'd expect it to be.

And now this really leads us to the question.
Since the laws of motion are time-reversal symmetric,
There are so many more physically possible paths
than expected.
The laws of physics allow for miraculous happenings,
Things we've never detected,

Things like an egg un-cracking,
Like a broken glass un-shattering,
Like a beer un-spilling,
Like water un-splashing,
The problem is that nothing in the laws of physics ex-
plains why this weird stuff *isn't* happening.

But for it to happen,
You would need a very particular force,
On every single particle,
Somehow directed upward from the floor,
Somehow to make the broken glass spontaneously
restored.

A blue sphere is positioned in the center of a grid that curves downwards, resembling a well or a gravitational well. The grid lines are white and the background is a gradient of blue. The sphere is also covered in a grid pattern, matching the background.

Will a particle radiate in empty space without bound? Or does there need to be an absorbing material around?

But the spontaneous flow of energy like this isn't something that we see.
It would require a decrease in entropy,
The measure of disorder, of possibility,
The measure of possible microscopic arrangements beneath,
The macroscopic system that we see.
This is all summarized in the science of heat.

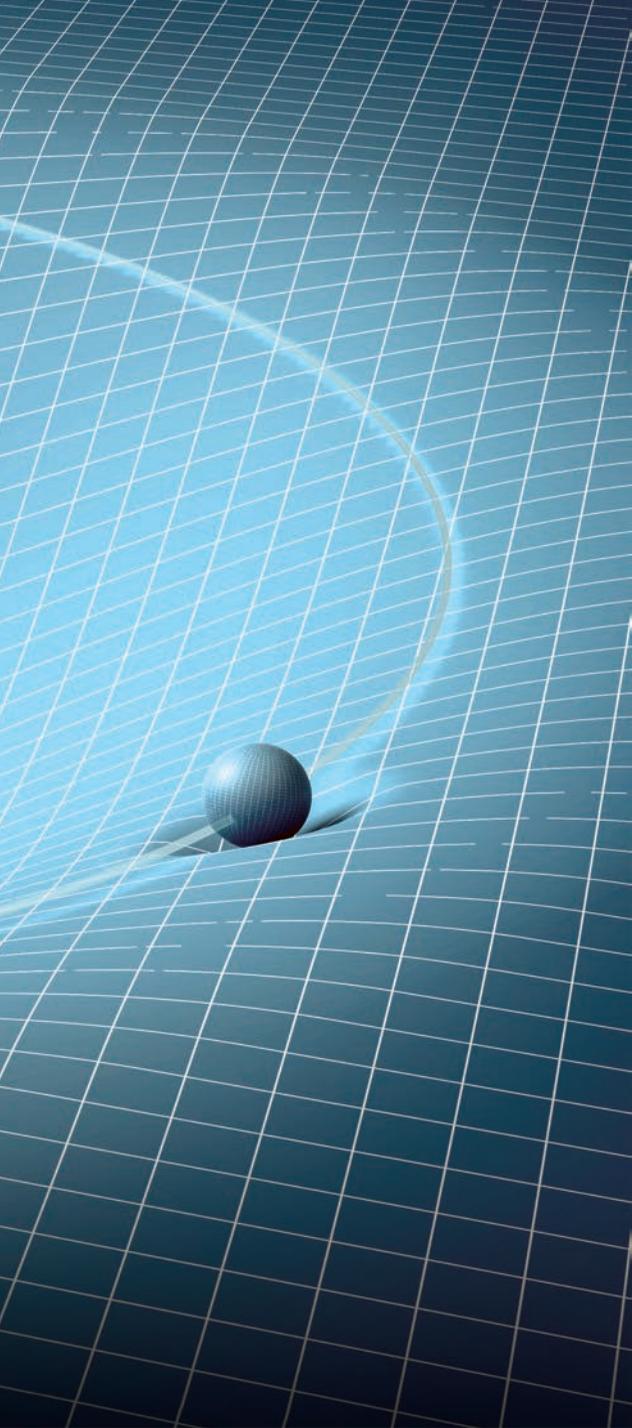
Derivable from statistical mechanics,
This is the second law of thermodynamics,
That the entropy of a system can only stay constant or increase,
If the system is isolated, meaning no energy enters or leaves.

This is a law that establishes a direction of time,
Because it makes irreversible processes well-defined.

In reversible processes, entropy remains the same,
But in irreversible processes, there is an entropy gain.

There are overwhelmingly many more ways,
That the subatomic particles could be arranged,
But on our level the system would still look unchanged.

It is possible for the glass to spontaneously recombine,
But this chance is so slim it essentially doesn't matter.



There are so many more microscopic arrangements compatible
With the glass remaining shattered.

But just counting a high number of possible microscopic states,
Doesn't fully explain why a glass doesn't un-break.
There is something else we need to postulate,
Which is that we can equate
The probability of each microstate compatible with a macrostate,
Meaning the chance of each microstate happening is the same.

Evolve time forward and it becomes probable entropy will rise,
But there is still a problem here,
Because of the symmetry in time.
Evolve time backwards, and entropy will still rise,
Contrary to experience - not something we want to hypothesize.

This is what led philosophers to take,
The origin of the direction of time,
As something that originates,
At the moment of the Big Bang,
The moment of the universe's conception,
Where the fact that nothing existed before the bang,
Means you can only evolve time in one direction.

And so, in thermodynamics,
The problem of the direction of time can be solved,
If you apply the postulate that the probability of each micro-
state is the same,
Only at the moment of the Big Bang, and then let time evolve.

But now consider the problem of electromagnetic radiation,
In which charged particles emit light when undergoing ac-
celeration.

Consider mainly, the argument that was raised,
On how time-asymmetry arises from these waves.
In his paper with Einstein in 1909,
Walter Ritz argued that radiation is responsible for the ob-
served asymmetry in time.
On his theory you don't need to consider probability;
Time's direction arises straight from electromagnetic theory.

If you're a physicist this might sound confusing,
Because the laws of electrodynamics are time-symmetric, just
like Newton's.

Experimentally we only observe radiation go from past to future.
In the time-reversed scenario light should come collapsing in,
But this is something we never see in the lab,
And so the theory must assume a certain boundary condition.
The rule of thumb is to neglect the solutions where light goes
from future to past.

They work just as well, but don't question it, don't ask.
Some would argue that that's a scientist's only task,

To predict the data they see in the lab.
 Those neglected solutions are called the advanced fields,
 And it's true, using them can feel really weird.
 It seems to violate causality,
 And creates a strange picture of reality.
 It's like saying the future affects how the past will be.

But actually, mathematically, for these types of equations,
 The sum of two solutions also solves it the same.
 You can solve the electrodynamics equations using a sum of incoming and outgoing waves.
 This might seem to violate your intuition,
 But it's just a description for waves traveling in superposition.

Note that the sum of these solutions has time-symmetry.
 Now I'll describe a recent analytical discovery,
 Made by Pardis Niknejadi, a physicist from University of Hawai'i.
 She showed that if you assume the usual boundary conditions,
 The laws of electrodynamics are violated or energy is not conserved.
 She also hypothesized an experiment to look for the existence of the advanced fields,
 The fields traveling in reverse.

And this would be a big deal,
 Because it had been thought that these advanced fields aren't really real.
 I realized that this changes the debate in the direction of time,
 Because some philosophers still argue against Einstein.
 For example, one philosopher of physics named Mathias Frisch,
 Argued that you should leave electrodynamics as it is.
 He says that there is no problem at all,
 Just take time-asymmetry in the radiation fields as a new fundamental law.

Others disagree, of course,
 Particularly philosopher of physics Jill North,
 Who argued that there is fundamental time-symmetry in radiation,
 But the observed direction of time arises from probability, not the equations.
 If you're familiar with the argument on how we observe the cosmic microwave background radiation, or the CMB,
 You'll see that she argues similarly.
 Advanced radiation fields are just something we no longer see,

Sort of like particle physics interactions that occurred when there was more heat.
 Back in the early universe light could travel toward the past,
 But as the universe cooled and expanded, this process didn't last.

Frisch's theory has already been analytically ruled out,
 But so would North's if Niknejadi finds advanced fields in the lab.

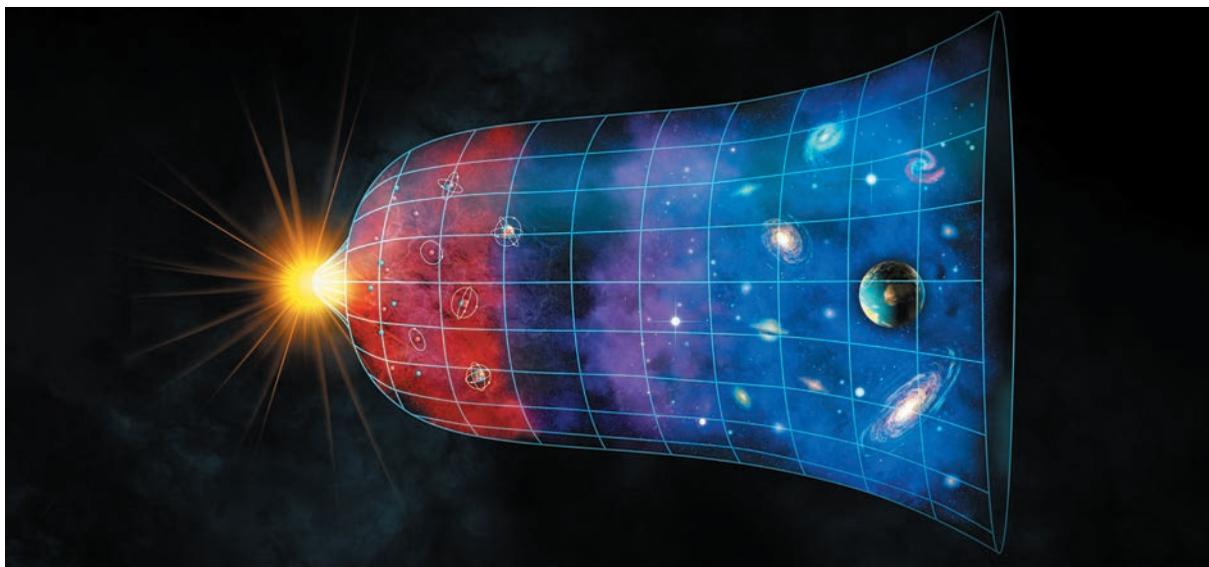
Something I should mention is that this is all about radiation into free space.
 But what about radiation that is confined?
 A study of radiation in a box actually won a Nobel Prize.

In an experiment by Serge Haroche,
 He found in his lab the fields traveling in reverse.
 An accelerating particle only radiated,
 When the radiation waves were compatible with the edges of the box,
 Which caused a bit of a shock.
 It's like the box had an effect on the particle's internal clock.
 How did it know what the edges of the box were shaped like?
 It hadn't radiated yet,
 So there was no bounce-back of light.

The only explanation:
 The advanced fields traveling back from the future carried this information.
 But still, this discovery didn't catch on generally.
 It was thought that maybe just in confined spaces did radiation have time-symmetry.

Now I'd like to conclude with a hypothesis proposed to me by physicist John Madey,
 That perhaps we could stop time, maybe.
 You see, in Niknejadi's paper, she favored a theory by Feynman and Wheeler,
 Which is just as successful as these other theories but wasn't taken seriously because it's weirder.

If a tree falls in the forest and no one is around to hear it, does it make a sound?
 You can ask an analogous question here and it's pretty profound.
 Will a particle radiate in empty space without bound?
 Or does there need to be an absorbing material around?



Feynman and Wheeler answer “no” to this question.
 They assume that even in free space,
 For a particle to radiate,
 There needs to be a thermodynamically absorbing
 boundary in the distance,
 Or else no light will escape,
 Even if a particle accelerates,
 Or rather, it just wouldn’t accelerate,
 Because in some sense,
 It waits,
 For information from those advanced waves
 From the future,
 To tell it about the boundaries’ shape.

Their theory is time-symmetric,
 But the direction of time comes from,
 You might guess it,
 The probabilities in the thermally absorbing
 boundary in the distance.

Madey suggested,
 What if we put something larger than a single ra-
 diating particle
 Inside a superconducting cavity,
 A cavity that inherently has no thermal absorp-
 tion in its boundary?
 What if we put an amoeba inside?
 Would the amoeba age?
 Or would we stop time?

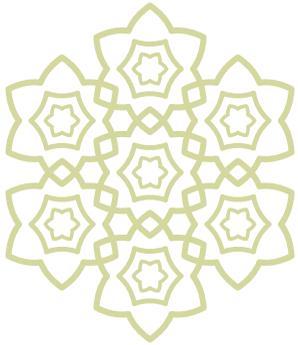
What is the physical origin of the direction of time?
 A philosophical question,
 But one that future experiments could decide,
 And where my intellectual journey will go,
 I don’t know,
 But I just let my memories of the future be my guide.

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For more research by Kathleen V. Tatem, please check out the institute she has recently founded:
www.tatemresearchinstitute.org.

Emerald Hills of the Heart



**CONVERSATION AND
COMMUNION**
(SOHBA AND MUSAHABA)

“Serving is a means of being favored with the guide’s special attention, and conversation or communion is a way to feeling and experiencing truth with all one’s inner and outer senses.”





S *ohba* (Conversation) means making effective speeches to direct people to the Almighty, enlightening others with words and thoughts, using other's good opinions of oneself to guide hearts to eternity, and always wishing well for others. The famous Turkish Sufi poet who lived in the 13th century, Yunus Emre, stresses the vitality of conversation and communion (*mushaha*) in this sense, saying: "What sets the soul right is the conversation of saints."

With respect to the relationship between a guide and the initiates on the Sufi way, there are two things which lead initiates to the truth: a guide's conversation and communion with his disciples and their serving in the lodge where the guide teaches. Serving is a means of being favored with the guide's special attention, and conversation or communion, which has been considered as an important means employed by the guide that is greatly beneficial, is a way to feeling and experiencing truth with all one's inner and outer senses. Nevertheless, benefiting from the guide so that one is "colored" by him depends on the rank of the guide. Every guide has an influence upon his disciples in proportion to the degree of his rank. The most perfect and greatest guide is the Almighty Himself. That is why Prophet Muhammad, the master of creation, upon him be peace and blessings, took on the universal, brightest color due to his being addressed by Him in the Revelation. The verse (2:138), *Take on God's color perfectly; whoever can be more beautiful in color than God?*, indicates this fact. After him come all the other Prophets and pure, verifying scholars and saints, who vary in the colors they have taken on, according to the rank of guides and the capacity of each to take on the color. All the scholars and saints who have and will come after God's Messenger have been and will be dependent on him and his guidance, both in taking on color and coloring their disciples. However, as mentioned before, both the coloring of others and taking on color varies according to one's capacity:

*Everyone benefits from God's enlightening gifts according to his capacity;
A snake receives poison from April rain, and an oyster a pearl.*

Service denotes seeking God's good pleasure and approval with sincerity and purity of intention, and putting oneself in the hands of one with whom God is pleased for teaching and guidance.

Service denotes seeking God's good pleasure and approval with sincerity and purity of intention, and putting oneself in the hands of one with whom God is pleased for teaching and guidance. As for communion, this means attending the courses of a friend of God with a heart whose doors are opened to Divine favors and blessings, and sharing his aura of holiness within which the Divine manifestations of grace pour forth. The Companions of God's Messenger were the most advanced of all in serving, and were accordingly favored with the most enlightened communion. This was due to the fact that the one who taught and held communion with them was the greatest of creation, whose single look was enough to cause the souls endowed with the necessary capacity to

rise to the high horizons of perfection. We should also point out that his disciples, those heroes of steadfastness, who put their hearts, senses, consciousness, and will power into orbit round that sun, had the necessary capacity and performance.

Every friend of God is favored with coloring those around him or her to a certain extent. The range of this favor is very broad, from a friend of God whose light may be likened to a candle in darkness, to those whose light may be likened to the most radiant stars that light up whole galaxies. In addition, as pointed out before, as with every guide or friend of God, those who benefit or receive light from them vary in their capacity.

This means that the extent or degree of coloring on the part of guides varies to the number of the capacities. So there are as many ranks or degrees of coloring and being colored as there are Prophets, spiritual guides and initiates who benefit from them, from the greatest of creation, who is the most polished mirror of the Light of Lights, to the one who has just taken his or her first step on the spiritual journey. The communion or conversation of Prophet Muhammad, the one who was universally favored with coloring others, was so influential and so great a blessing for him that no one has ever been, nor will ever be, able to attain it. Consider the fact that those who were honored with the conversation and companionship of him, who said, "The first thing which God created is my light," [1] were and have been called with the

title of *Ashab* (meaning the friends with whom he communes), not with another title even though they were the fortunate ones who traveled to God most eagerly and sought His good pleasure and approval most of all.

Everyone listening to or sharing the atmosphere of a guide, observes in his every manner his belief in the Unique, Eternally Besought One, his knowledge and love of Him, and the degree of his relationship with Him. Influenced by all these blessings that the initiates observe in the guide, they find themselves in an indescribable mysterious spiritual atmosphere. Those flying toward the "Sun of Suns," attracted by the centripetal force of a guide, both benefit from his knowledge of God and follow in his footsteps to reach every point that he has already passed.

I think this is also the reason why people gather around spiritual guides who are sources of radiance, and develop as particular spiritual institutions or schools. It is because of this that in the early periods of Islam, the Muslim Sufis who sought to strengthen or consolidate their individual relationships with the All-Radiating One, came together in dervish lodges or similar institutions of enlightenment where the Ultimate Truth could be "observed" beyond all concepts of modality. In those buildings of light, which they saw as being similar to *Suffa* (the hall adjacent to the Prophet's Mosque) in Medina, where those of the Companions stayed who had dedicated themselves, during his lifetime, to studying the Qur'an and the Sunna, they sought the way to develop an atom into a sun, a drop into an ocean, and to change the darkness of corporeality into light. As this was the main reason for the appearance of dervish lodges and distinct spiritual orders in later centuries, it is not possible to claim that they are incompatible with the spirit of Islam. Moreover, since everyone has weaknesses or shortcomings of character that they cannot overcome alone, being in the company of others seeking the same goal attracts God's special help and protection. A member of a community or group thinks with many heads, turns to God with a collective heart, strengthens the entreaties of one voice with the entreaties of many, and turns his or her individual notes into the melody of a chorus. In the words of Bediuzzaman, by participating in the other-worldly deeds of a community, the individual can transcend the normal level of attainment in acts of obedience to God.



Benefiting from the communion or conversation of spiritual guides depends, in one respect, on the initiates' humility and feelings of nothingness, and of their being freed from the influence of their carnal souls.



Those who have come together around the same feeling, thought and goal have such a depth in their turning to God in unison, such a richness in their consciousness and feelings, and such a profundity in their thoughts and concepts, that individuals of even the greatest capacity and perfection cannot attain the least of the blessings that come their way in their community. In the illuminating atmosphere of communion, benefiting and causing to benefit, enlightening and being enlightened, feeling and causing to feel occur differently and in an abundance peculiar to that atmosphere.

In fact, the most important purpose of communion is that belief should be supported with a knowledge of God, a knowledge of God that is based on any of the degrees of certainty, by making journeys at the levels of life of the heart and spirit under the guidance of the Truth of Ahmad [2], and these journeys are accompanied by a conscious observation. The most important capital and endowment of the initiates during such journeys and observations is that their inner faculties are aroused with the actions of the heart and voice, for example, the recitation of God's Names and reflection, and the demonstration of their

deserving Divine gifts. Since deserving such gifts can only be acquired by following the Message of the master of creation and therefore bearing witness to the truth of this Message and the Messengership of him who brought and preached it, this decisively proves that he was absolutely truthful in all his speeches and actions.

Benefiting from the communion or conversation of spiritual guides depends, in one respect, on the initiates' humility and feelings of nothingness, and of their being freed from the influence of their carnal souls. If travelers to truth have not been able to completely free themselves from the influence of their carnal souls and to rise to the point of always preferring God's commandments and obtaining His good pleasure and approval over their own views and desires, they may commit the error of attributing to themselves being favored with some gifts or the development of some of their faculties. Instead of always being thankful to God, they may become conceited. Furthermore, if they are sometimes and temporarily favored with the feeling of attraction and being attracted (toward God by Himself), they may roll into the valleys of uttering words of pride that are incompatible with the rules of Shari'a, and therefore suffer loss upon loss, although a spiritual journey should be a means of gain after gain.

In fact, those who do not converse or commune with their disciples in accordance with the rules of the way of God's Messenger, upon him be peace and blessings, cannot always maintain the balance in the spirit of Islam and may display relaxed attitudes or make utterances that cannot be reconciled with their rank or position. They may even go so far as to prefer sainthood to Prophethood and, favoring the principles and manners established by the founder of their orders over those of the Prophetic way, commit such great errors that it is as if one chose to be illuminated by a candle instead of by the sun. Besides, those unfortunate ones who prefer sainthood to Prophethood will naturally see their guides or masters as being greater than the Companions, who were the foremost and most distinguished students of Messengership. This will denote that communion has changed places with gossip, that spirituality has become darkened in its own home, that the essentials originating in the Divine sources have been replaced by those of personal choices and desires, and that there no longer remains the sacred power of attraction which the spiritual guides and their aura must have. As Muhammed Lutfi Efendi laments:

*Those who were valiant have melted away like butter;
lovable personages have all been reduced to dust.
Thorns have grown in the place of flowers;
honeycombs have shrunk and been emptied of their honey.*

The communions and conversations which resemble idle talk in cafes bring nothing in the name of Divine gifts and never assist the disciples to attain the truth. Rather, Satan intervenes in their frequency and sends out sparks. So, every action that is in the guise of a spiritual interaction in these places, which appear to be homes of spirituality, but have long since expelled sincerity and the feeling of being seen by God, is only a deception or even perdition, and expecting God's special favors is nothing more than mere illusion. Those who attend such places as if they were attending a united congregation are only joining in a spiritless ritual. In addition, if they regard criticizing and quarrelling with others, rumor-mongering and slander, and cherishing ill-opinions about others as religious services, then they are gravely mistaken; the places they attend are only places of hypocrisy and their guides are not Sufis, but rather bigoted highwaymen. Who knows if such attitudes did not cause Destiny to allow the banning of such and the closing of the ways that led to their collapse?

*Autumn winds have blown and the vineyards
have withered away;
and there no longer exist the gorgeous roses in
the gardens.*

(Muhammed Lutfi Efendi)

O God! Favor us with a good, happy end in all our affairs, and save us from humiliation in the world and punishment in the Hereafter. And bestow blessings and peace on the master of creation, Muhammad, and on his Family and Companions, the noble, honorable and godly ones.

Notes

1. al-Ajluni, *Kashfu'l-Khafa'*, 1:265.
2. The Truth of Ahmad is the truth which Prophet Muhammad, upon him be peace and blessings, has as Ahmad or before and after his worldly life. This usually refers to his unparalleled sainthood contained in His Messengership. (Tr.)

PHYSICS

by Bilal Sarimeseli



WHAT ARE YOU “WORKING” ON?

“The microwave lets me inquire about the variety of spilled content on its glass plate. The resonance frequency that initiates its rattling has been so unpredictably arbitrary that I started wondering whether it can operate as a time machine.”

A rare, rainy day for drought-stricken San Jose, California, ushered a lot of wet students into my room at lunch time. I like to call my room “Mr. B’s Restaurant” due to the diverse scents, flavors, and the vibrant psyche therein. The microwave lets me inquire about the variety of spilled content on its glass plate. The resonance frequency that initiates its rattling has been so unpredictably arbitrary that I started wondering whether it can operate as a time machine, opening intergalactic portals for the remainder of its life.

While your skills, aptitudes, and preferences lead you to a direction, stumbling over a temporary force field and choosing an incorrect direction will likely end with you losing your energy to your surroundings in the form of heat, frustration, waste, and desperation as you recalibrate with hopes that it is not late.

To be more realistic though, I once told my hunger-driven students that they can use this microwave as a means to roughly measure the speed of light (when you overburn your hardened lunch in it while the rotating platform does not do its job). Many are shocked to hear this: how can the least demanding culinary tool teach them something scientific? Physics is entirely interesting when we show its living aspects and take it out of the realm of equations and boring lectures. Yet, still, some students got away from it merely because it is a science subject and that they are not self-allegedly science persons. So, could a physics teacher genuinely put physics on a student's plate as something edible, relatable, or even palatable? Maybe if they see that physics encroaches into every aspect of their lives—even social studies.

It seems worth trying it.

During lunch on that rainy day, I overheard two students talking fervently about many topics, like whether pizza with pineapples is edible, the new sequels to games they've been playing, etc. One sentence stood out and reverberated across my physics-molded neuron cells: "I am working on..." This sentence opens the door to making physics, and especially the concept "work" more approachable, especially for those students lacking a solid foundation of physics in their day-to-day lives. I pursued this opening, struggling to explain it on the board. Looking at my baffled students, I thought about the hidden, dormant, emerging, flowing, oozing, and bursting mental potentials and realized that they have the power to change the flow of things around them. These

thoughts trickled out, and Mr. B started his serenade for physics.

In physics, “work” is done when a force causes an object to displace in the applied force’s direction.

I imagined my students’ question: “So, Mr. B! When you were saying the definition of “work,” you were literally pushing the wall as if to break into the biology room next door. So, since the wall did not move, does it mean that you didn’t do any work?”

“Yes, it does, for I could not break into Mr. Q’s room! If I could, I would have to talk about this with Mr. Principal rather than you!”

Work in physics is the way of transferring energy to or from something. As “sharing is caring,” to take care of other systems, you have to move towards them, which is not like mere empathy; no, it’s actually changing your position, be it leaving your comfort zone or walking to help.



Getting more inspired by the baffled looks of my students, I felt like I had the upper hand. I targeted my words to the receivers in their hearts: “Though of different and similar types, all of you have huge potentials and energies in you. You have levels of forces you can apply to various hobbies, goals, or destinations. These treasures of skills, potentialities, abilities, and talents only surface when they do ‘work’ and transfer ‘energy’ to other beings or entities. Life is going on with its glorious energy transfers. The Sun takes care of plants; plants have appointments with animals, and humans have links with all, and all with each other. While this is the scene, why don’t we get out of our comfort zones, displace, move, and approach our destinations? Nature calls for motion, the joy of movement, and constantly using energy to grow. This notion is embodied in the formula **Work Done = Force Applied x Displacement**. Yes, ‘may the Force be with you!’ But this is not a sufficient invocation—albeit a nice one that misses the ‘motion’ part.

“Force has to be lucky enough to be accompanied by the directed motion; then, it can gracefully transfer energy and act in the way it is meant to. You might need to use your force in the correct direction. While your skills, aptitudes, and preferences lead you to a direction, stumbling over a temporary force field and choosing an incorrect direction will likely end with you losing your energy to your surroundings in the form of heat, frustration, waste, and desperation as you recalibrate with hopes that it is not late. A scalar is what we call a quantity with no direction, size, or amount. If you want to be practical and go to a grocery store, asking ‘I want 2 pounds of potatoes in the east direction,’ violates the boundaries of the use of scalars; you might receive a bag of potatoes with a considerable amount of velocity in a given direction—that is to say, to your face. So, we have to know where to use proper scalars in physics, just like we have to show proper and appropriate manners, skills, and powers at correct places and times.”

Thus, Mr. B ends his speech by saying, “Know your potentials; do not compare them with others’. The work done in physics is known by the product of the force you exert with the distance taken along the force. Calibrate your goals and do ‘work.’ If you mistakenly think that you are not smart, think about the fact that you can still do more work than those who are allegedly ‘smarter’ yet do not move.”

(continued from the previous issue)

The Troubled Watermill

A Commentary (Part 2)

“I am the Troubled Watermill;
My water flows, roaring and rumbling
Thus has Allah commanded;
for I've troubles, I groan”



Halfway through the poem, the watermill has finished his answer to Yunus' question. Even though he has explained the source of his troubles, he continues with a declaration of the present, instead of a recounting of the past: he is The Troubled Watermill, and his water flows, roaring and rumbling.

The line *My water flows, roaring and rumbling* contains layers upon layers. Firstly, it expresses the exhaustion and flabbergasted state of the watermill: all he does is move water from one place to another. He has just recounted his past order and beauty as a tree, and now he points to the present in wonder. How has life turned into such monotone, repetitive, nonsensical actions? Day in, day out, the watermill takes water from the stream below, and it deposits it above. Without any end in sight, It continues to lift the water from the river and bequeath it above. Again and again, every minute he repeats his job, for hundreds of years.

And yet, just as the watermill is unwearied in his recitation of poetry, resolute against his separation, he must be unwearied in the minute day-to-day he finds himself in. The watermill has, by resigning himself and saying *Thus has Allah commanded*, reached one of the highest ranks one can. Reliance and resignation upon the Divine Command, to recognize the circumstances we are in and their absolute tedium and low nature, whilst simultaneously understanding that Allah is absolutely Wise and Knowledgeable in all he does — that is the full realization of “You alone we worship and You alone we ask for help” (1:5).

As for the second layer of meaning, the water that flows from the watermill can be seen as the tears it sheds. For the true 'Ashiq, the fire of love does not stop at his tongue. Every limb, every cell and atom cry out and groan of his trouble. The eyes, being one of the most crucial parts of the body, display this by becoming unending springs of water. There are countless narrations of Prophet Muhammad, peace be upon him, shedding tears, be it during worship or outside of it. The eyes are the windows through which the soul sees the world, and the tears are the overflowing love that the vessel of the soul can not contain. The soul in love is like a flooded house, to such a degree that when you open the windows, everything inside rushes out.

What I rendered into the English as *roaring and rumbling* is probably one of the hardest sections to translate. The original Turkish uses the phrase *yalap yalap*, which can refer to the roaring and splashing sound made as water falls. In this sense, it intensifies the crying of the watermill. Not only is he shedding tears, but those tears are so heavy that they splash and rumble as they hit the ground, showing the extent to which the watermill is in love.

However, there is also an alternate reading, perhaps more metaphorical. *Yalap yalap* can also refer to the glistening of a surface as light bounces off it. In this sense, the tears flowing from the watermill become a great and shining source of effusive light. Whoever looks at them would see their beautiful shimmer and sparkle.

This touches on another aspect of the lover of the Divine: Beauty. When the 'Ashiq is fully realized, he takes on the Beauty of the Divine, and whoever looks at him can not see anything but the reflections and gleams of light as it bounces upon his mirror.

This beauty is not one that you can measure. It is not found in the ratios of symmetry and geometry, but rather one that comes from the world of the unseen, witnessed by the heart. The most perfect example of how this may be are Prophet Yusuf (Joseph) and Prophet Muhammad, peace be upon them. Even though the former was given half of all beauty, and women cut their fingers without realizing upon seeing him, the Prophet was in fact even more beautiful, his soul shining with the reflections of Divine Beauty to an even greater degree, such that 'Aisha (ra) proclaimed: "Had those women seen the Prophet, they would have cut their hearts instead" [Shamail Al-Muhammadiyah].

Keeping in mind this connotation of *yalap yalap*, if the flowing water is instead taken to refer to the particular acts of monotony and effort that the watermill undertakes, then this line becomes even more meaningful. Instead of only referring to the sparkling beauty of the tears, instead it refers to the beauty that radiates from every single act the lover carries out.

Certainly, whatever is touched by the beautiful is also beautiful. Whatever is associated with beauty also takes upon it beauty. Just as Majnun kissed the walls and stones that witnessed Layla's beauty, the most pure lovers and worshippers of Allah scatter beauty wherever they go, in whatever they do, and however they do it.

*I am but a mountain's tree; Neither am I bitter,
nor sweet
I am but a pleader to the Lord; For I've troubles,
I groan*

These next lines are a most concise explanation of the greatest ranks that the 'Ashiq can reach. Among the wondrous different experiences that the lover is beholden to, one that is particularly sought after is Fana'. This state is marked by the annihilation of whatever is from the lover in the beloved. The literature and discussions around Fana' is vast and we can not hope to deal with it to such an extent.

However, what Yunus says here is, in my view, sufficient enough to grasp the basics of Fana', which in many ways is the highest aspiration of the lover: to be united with his source. The first thought that underpins Fana' has actually been conveyed throughout the whole poem. It is the trouble of the Watermill, his separation from the mountain.

The second step onto reaching Fana' is in the extension of this realization to its fullest degree. The 'Ashiq that has fully been enveloped and filled with love holds nothing inside his soul except his trouble. He only sees, feels and thinks of how he is separated from the mountain, and that he is from it. The true lover removes from himself everything except being a lover, and his love removes from him everything except the desire of unity. The watermill, at this stage, affirms nothing of himself except that he is a mountain's tree.

The next phase of consideration is one that flows naturally from the last. If the lover only sees, thinks, feels, and senses the beloved, then what

A large, leafy tree stands in a grassy field. The tree is the central focus, with its branches spreading out. In the background, there are rolling hills and mountains under a clear sky. The lighting suggests a soft, possibly early morning or late afternoon setting.

is left over of the lover? When every one of our senses is blinded by the light shining on it from the beloved, then one can sense nothing but the beloved. Furthermore, one can make no affirmation of any sensation or experience except of the beloved.

A perfect example to better elucidate this is of Majnun and all that he went through in the search for Layla. He was ridiculed by his people, yet felt no chagrin; walked day and night through the desert, yet felt no discomfort; lived in the forest, naked and without food or drink, yet felt not a sliver of cold, illness, hunger or thirst.

There was nothing in the existence of Majnun except the existence of Layla. As a fully enraptured lover, he had no identity except in being a lover. This state is what the watermill expresses as he declares: Neither am I bitter, or sweet.

The final and most lofty station is the one in which the lover combines both his separation and union. He knows of his separation and is forever troubled by it, all whilst experiencing his Lord at every moment and being delighted by their union.

At last, what we end up at is the annihilation of the lover within the beloved. Everything that the 'Ashiq is or was, remembered or imagined, saw or heard, is annihilated and lost. He becomes the most perfect example of "Every being on earth is bound to perish, and only your Lord Himself, full of Majesty and Honor, will remain"(55:25-26). The bitterness and sweetness both are replaced by the beloved, and the lover has found what he lost so long ago: unity with his origin.

However, the station of Fana' is not the end of the story of love. There exists another step, much harder to reach and unfathomably harder to maintain than that of annihilation. It is called Baqa, or subsistence, within the beloved. After the height of rapture that the lover experiences in annihilation, those who are truly spiritually mature descend back onto the earth from the heavens, and once more take their place within it.

As opposed to the state of separation (Farq) that existed before annihilation, when in the state of Baqa, the lover experiences his beloved through all that separates them. He sees with his eyes, and yet still witnesses his Lord; he listens to the voices of creation, yet still hears the Speech of Allah. In the beginning, the lover groaned of his troubles, constantly in pain over his separation from the beloved. Then, in experiencing annihilation, his troubles as well as his own self disappeared, in ecstatic joy and delight of being unified with the beloved.

The final and most lofty station is the one in which the lover combines both his separation and union. He knows of his separation and is forever troubled by it, all whilst experiencing his Lord at every moment and being delighted by their union. This is why the watermill affirms that he is a *pleader to the Lord*, even after admitting to his non-existence in the previous phrase.

When the lessons that the Troubled Watermill has been imparting on Yunus are taken into consideration, Baqa is quite evidently shown to be the

most perfect rank that the lover can achieve. The servant can not truly fulfill his duty to Allah without first being separate from him. The lover fully annihilated can not willingly moan and sing poetry of his troubles or act as the Lord's vicegerent. This is this state that the Prophet and his companions walked the earth with, never once faltering in acknowledging all of Allah's signs, and simultaneously witnessing Him in everything.

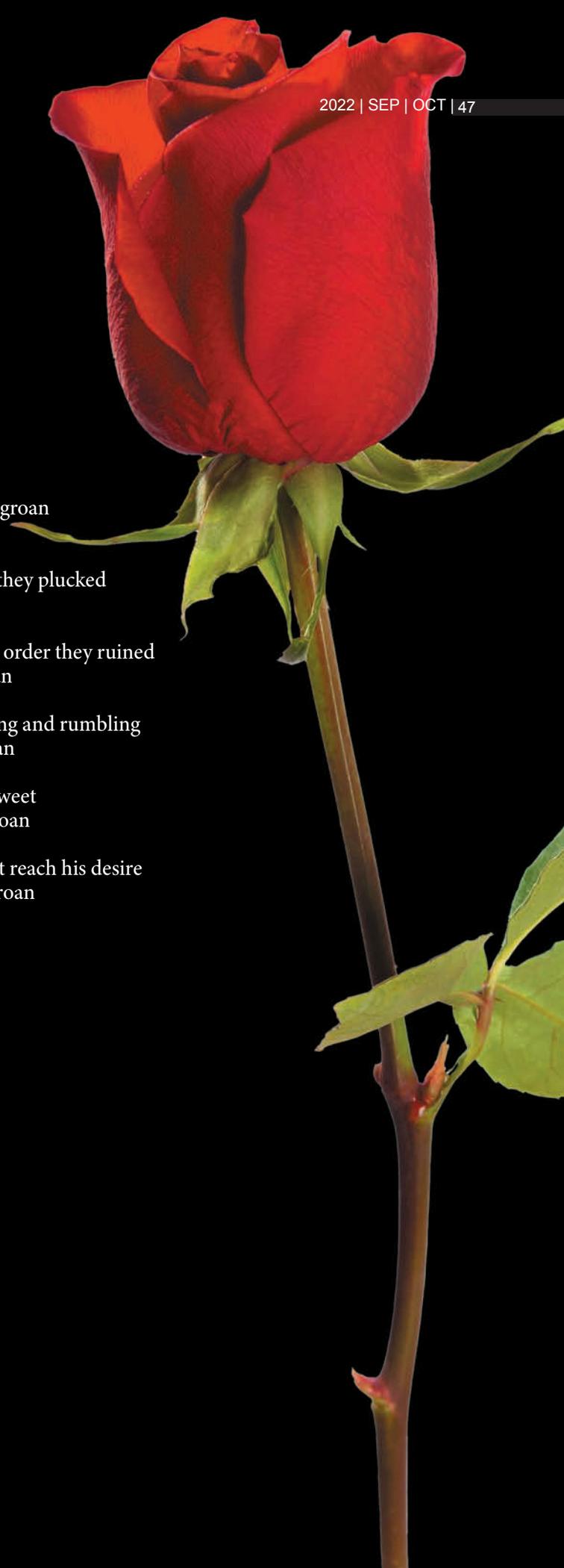
Yunus, whoever comes here will find no joy; Will not reach his desire

Nobody stays in this Transient; For I've troubles, I groan

Over the course of the watermill's answer to Yunus' inquiry, one thing has become evident. The answer of the watermill, in the form of this poem, is much more elaborate than needed. In fact, much more than giving a simple answer, the watermill has taught Yunus about the origin of creation and the tale of love; about the troubles of separation and the states of annihilation. The listeners to the watermill, Yunus and us, have been given an essential lesson on the tenets of Tasawwuf and 'Ishq. Much like Mawlana Rumi does in the *Masnawi*, the tale was a front for the guidance to higher truths.

Finally, the watermill decides that it has said enough, and refers to us directly, imparting his most valuable piece of advice, learnt from centuries of troubled moaning: *whoever comes here will find no joy; Will not reach his desire.*

Whatever we achieve in life, wherever we go or attempt to achieve, it is, at the end of the day, left meaningless. This world that we have found ourselves in was never meant to fit us, or quench our thirst. Our Lord has fashioned us for much more lofty spaces. Why do we strive to own this perishing world when even its Creator does not even see it worth as much as a mosquito wing [Sunan ibn Majah]?



The Troubled Watermill

By Yunus Emre

Why do you groan, O Watermill; For I've troubles, I groan
I fell in love with the Lord; For It do I groan

They found me on a mountain; My arms and wings they plucked
Saw me fit for a watermill; For I've troubles, I groan

From the mountain they cut my wood; My disparate order they ruined
But an unwearied poet I am; For I've troubles, I groan

I am The Troubled Watermill; My water flows, roaring and rumbling
Thus has Allah commanded; For I've troubles, I groan

I am but a mountain's tree; Neither am I bitter, nor sweet
I am but a pleader to the Lord; For I've troubles, I groan

Yunus, whoever comes here will find no joy; Will not reach his desire
Nobody stays in this Transient; For I've troubles, I groan

Turkish:

Dolap niçin inilersin; Derdim vardır inilerim,
Ben Mevlâ'ya aşık oldum; Onun için inilerim,

Beni bir dağda buldular; Kolum kanadım yoldular,
Dolaba layık gördüler; Derdim vardır inilerim,

Dağdan kestiler hezenim; Bozuldu türlü düzenim,
Ben usanmaz bir ozanım; Derdim vardır inilerim,

Benim adım dertli dolap; Suyum akar yalap yalap,
Böyle emreylemiş Çalap; Derdim vardır inilerim,

Ben bir dağın ağacıyım; Ne tatlıyım ne acıyım,
Ben Mevlaya duacıyım; Derdim vardır inilerim,

Yunus bunda gelen gülmez; Kişi muradına ermez,
Bu fanide kimse kalmaz; Derdim vardır inilerim

The watermill that Yunus meets is troubled because his true desire is his Lord and he exists upon this finite world. Yet paradoxically, it is also very clear that he relishes his troubles, composing poetry of his groans and singing it delightfully. How horrible would it be, had all we could look for is this decrypt universe, instead of the Owner of Majesty and Honor.

Whatever we own perishes, whoever we cling to dies, and whatever satisfaction we reach disappears. Thus the watermill warns us, having lived for so long and seen so much, that we will find no joy if we search for it here. This is expressed concisely and accurately in the *Masnavi* with:

*'How can my mind stay calm this lonely night
When I can't find here my beloved's light?'*

Not only is seeking joy in this world the height of absurdity, any of our desires from creation is also destined to disappoint us as well. The truest desire of all creatures is their Lord, affirmed on the day of their creation, and confirmed by Him in "but the true believers love Allah even more"

(2:165). Mawlana Rumi once again effectively conveys the wonders of leaving aside all false desires and only loving Him:

*Through love the earthly form soars heavenward,
The mountain dances nimbly like a bird:
Love made Mount Sinai drunken visibly,
So Moses fell and swooned immediately!*

The watermill that Yunus meets is troubled because his true desire is his Lord and he exists upon this finite world. Yet paradoxically, it is also very clear that he relishes his troubles, composing poetry of his groans and singing it delightfully. How horrible would it be, had all we could look for is this decrypt universe, instead of the Owner of Majesty and Honor.



The opening chapter and most sublime summary of the Qur'an, after teaching of the Source of Mercy in "the Most Compassionate, Most Merciful"(1:3), immediately moves on to teaching of the eternal abode: "Master of the Day of Judgment"(1:4). The servant who fully realizes the weight of the transiency of this universe, will then directly seek the eternal. Just like Adam, we were all created for paradise, and so we must seek its eternity instead of the obliteration of this world.

And so the Troubled Watermill ends his advice, and lesson, with *Nobody stays in this Transient*. Content that he has imparted enough onto Yunus, he turns back to face his Creator and once more starts groaning.

May Allah enable us to be as troubled in love for Him as the watermill. May He grant us experience and unity of Him just as he did upon the Pride of Creation, on whom be countless blessings, as well as on his family and companions.

of absurdity, any of our desires from creation is also destined to disappoint us as well. The truest desire of all creatures is their Lord, affirmed on the day of their creation, and confirmed by Him in "but the true believers love Allah even more" (2:165). Mawlana Rumi once again effectively conveys the wonders of leaving aside all false desires and only loving Him:

*Through love the earthly form soars heavenward,
The mountain dances nimbly like a bird:
Love made Mount Sinai drunken visibly,
So Moses fell and swooned immediately!*

The watermill that Yunus meets is troubled because his true desire is his Lord and he exists upon this finite world. Yet paradoxically, it is also very clear that he relishes his troubles, composing poetry of his groans and singing it delightfully. How horrible would it be, had all we could look for is this decrypt universe, instead of the Owner of Majesty and Honor.

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A vibrant photograph of three kingfishers in flight over a body of water. The birds are captured in various stages of flight, with their wings spread wide, showing intricate feather patterns. The water is splashing, creating a dynamic and energetic scene. The background is a soft, out-of-focus green, suggesting a natural, outdoor setting. The overall composition is balanced and visually appealing, highlighting the beauty and complexity of bird anatomy.

Mathematical Harmony

in the Bird's Body Structure

*Sometimes I want to be a bird and fly.
Sometimes I want to be a fish and swim.
I don't know how to fly or swim.
Right now?
I'm counting again, and I'm picking up my years
and splitting them up with my disappointments.
I'm starting again today.*

Anonymous

“It’s not just wings that allow birds to fly; they have many physical features that work together to make flight possible. They need lightweight features, a streamlined body, and a rigid skeleton to provide firm attachments for powerful muscles.”

As humans, the trait from the animal world we most admire is probably the ability to fly. People have dreamed of flying like birds for thousands of years. Birds can take off and fly with movements that seem simple to our eyes. All they do is flap their wings. The size and shape of the wings affect the way a bird flies.

But it's not just wings that allow birds to fly; they have many physical features that work together to make flight possible. They need lightweight features, a streamlined body, and a rigid skeleton to provide firm attachments for powerful muscles.

Small-winged birds usually fly by flapping their wings at least 40 times per second. On the other hand, the wide wingspan of a larger bird allows it to glide through the air without flapping its wings. A swift's pointed wings help it dart about at great speed, while the very long wings of an albatross enable it to glide with little effort.

The rapid wing beats of smaller birds use more energy. Lowering the wings from top to bottom means lifting and consuming power; flapping from bottom to top maintains flight and balance. For example, a bat flaps its wings eight times per second while flying at cruising speed—that is, every 0.125 seconds.

With each flapping of its wings, a bird's body naturally goes up and down almost like a spring. The body's motion also follows a fluctuating structure depending on wing movements.

The zebra finch is the bird with the highest flapping frequency. It can achieve 26.9 wing beats per second—or, 26.9 hertz (Hz), which is 3 to 3.5 times more than the bat in the same time frame. The flapping of a bird's wings is assumed to be symmetrical and equal. However, in real life, many birds perform asymmetrical flapping and positioning. A bird can't always fly flat, in a straight line. Slow flapping is expected in a downward stroke, and rapid flapping is upward. It should be noted that small birds use medium-sized flights to perform alternate flapping and compound movements.

The size of the wing is another crucial factor. Bigger wings produce greater lift than smaller wings. So, smaller winged birds need to fly faster to maintain the same lift as those with larger wings. When the wings are open, a bird's wingspan is at right angles to the direction it is flying. It should also be noted that different species can fly and attack at different angles.

With each flapping of its wings, a bird's body naturally goes up and down almost like a spring. The body's motion also follows a fluctuating structure depending on wing movements. When the wing flaps at the initial right angle and relative to the flight path, one can observe a wave movement in the wings. The width here is simply the height of the flight waveform. While this height is 26 cm in bats, it is 12 cm in finches. Although different species have different flapping movements and flight patterns, a comparison of birds' wavelengths can be made with that of sea animals, like dolphins and sharks, whose swimming speeds are most efficient. Optimum cruise speed in dolphins, sharks, and bony fish depends on tail swing frequency and tail width. The dimensionless number value called Strouhal constant, which is used to describe

oscillating flow mechanisms, usually gives a range between 0.2 and 0.4. The Strouhal constant is also found in flying birds and bats.

Three factors are required to obtain this constant: frequency, wingspan, and speed. As an example, bats fly at a speed of 6 meters per second. When calculating Strouhal constant, the frequency value is multiplied by the wing width and divided by the bird's speed.

Let's calculate the Strouhal constant of the kestrel. If the frequency for the kestrel is 5.61Hz, the width is 0.339 m, and the speed is 8.1 m/s, the Strouhal constant is calculated as follows:

$$St = f \cdot A / U = (5.61) \cdot (0.339) / 8.1 = 0.235.$$

The projection was made among 42 different bird species. We observe that bats approach the upper limit of Strouhal constant, whereas large birds approach the lower limit.

Swallows are some of the most common birds. Of the 74 swallow species in the world, 47 live in Africa. Two of them—the West African swallow (*Hirundo domicilia*) and South African swallow (*Hirundo Spilodesa*)—are named for the continent. Despite its name, the European swallow is also common in Africa. After 54 years of capturing and releasing 26,285 birds, the Cape Town University-supported Avian Demographics unit has a lot of data on these birds. Studies have shown that the

average wing length of an adult European swallow is 12.2 cm, and its body mass is 20.3 grams.

The known frequency (f) and width (A) measurements for the European Swallow make it possible to estimate the speeds of similar bird species. It is possible to estimate the air velocity (U) with these two values. The European swallow, with a wingspan of 18 cm, can flap its wings 18 times per second.

If $St=0.2$ is taken for the highest speed $U_y = (15 \cdot (0.22)) / 0.2 = 16.50$ m/s

If $St=0.4$ is taken for the lowest speed, $U_d = (15 \cdot (0.22)) / 0.4 = 8.25$ m/s.

By ignoring the mass value and looking at the actual wing lengths, not the flight wing, we see that the European swallow flaps its wings 14 times per second, and its flight wingspan is 23 cm.

In this case, we can say that the European swallow flaps its wings an average of 15 times per second, and the flight wing width is 22 cm.

The velocity formula is $U = (f \cdot A) / St$.



By averaging the lowest and highest speeds, the European swallow's speed is found to be approximately 12.4 meters per second. In this case, the average speed of the swallow will be 45 km per hour. If we calculate the fuel consumption in a car traveling at the same speed, we find that you can go about 10 km with one liter of

gasoline—which means it would take 4.5 liters of gasoline to cover 45 km. In this case, the cost (considering that gasoline prices change daily) is around \$10. This money may not even be the amount of feed the swallow eats per year! We should marvel at the European swallow's great design.

LANGUAGE

by Jacob Hardy

Universal

Language Translator





Imagine that one day, in your garden, you find an ancient coin. On this coin are written unknown characters. It's unlikely you'll be able to read these figures until the code is cracked by a specialist. Even if you do not know about the period or civilization from which this coin comes, you will no doubt conclude that the symbols on it represents a language. Whether you can read them or not is irrelevant; language is recognizable.

To exemplify, Morse code is a system in which letters—let's say the 26 letters of the English alphabet—are represented by only three basic parts: dots, dashes, and spaces. By combining these three symbols, one can produce more than 500,000 English words that, again, can be combined into an infinite number of phrases or sentences. The fact that we can communicate messages merely through simple dots and dashes is amazing and thought provoking.

The chirping of birds, especially in the early morning hours, cannot be considered primitive sounds that only consist of a couple of quack-quacks, woo-woos, or cock-a-doodle-does. Akin to the symbols of Morse code, the chirping, which we commonly regard as unsophisticated and therefore mostly ignore, may in fact communicate a huge variety of valuable messages. For instance, the nightingale—whose songs might comfort us—may in reality be telling a completely different story. Limiting the language of animals to simple signals of warning, happiness, mating, and so on might be a mistake; these basic emotions may just be the tip of the iceberg when it comes to animal communication. Do animals, then, have a language like humans, perhaps with a different purpose or use?

“Limiting the language of animals to simple signals of warning, happiness, mating, and so on might be a mistake; these basic emotions may just be the tip of the iceberg when it comes to animal communication.”

Imagine what a universal translator, once invented, could tell us by converting all these animal signals into human speech. Its impact on human life will be unquestionably groundbreaking.

Human-animal talk in the Qur'an

King Solomon, known in Islam as Prophet Suleyman, was endowed with the miraculous ability to communicate with all animals, including birds. Let me draw your attention to some related verses from the Holy Qur'an:

Solomon succeeded David. He would say (citing in gratitude God's favors to him): "O people! We have been taught the language of birds, and we have been granted (some portion) of everything (which God provides for His servants). Surely this is a conspicuous favor. (27:16)

Another verse tells of a story where Prophet Suleyman came upon a colony of ants while on a military campaign with his great army:

Until, when they reached a valley of ants, one of the ants said: "O you ants! Get into your dwellings lest Solomon and his army crush you unawares." (27:18)

Upon hearing the ants talk, Prophet Suleyman addressed God:

Smiling at her words (in humble contentment with God's favors to him), he said: "My Lord! Inspire and guide me so that I may thank You for Your favor which You have bestowed on me and on my parents, and so that I may act righteously in a manner that will please You; and include me (out of Your mercy) among Your righteous servants." (27:19)

Though these examples from the Holy Qur'an may be sufficient, I cannot help but share with you another remarkable example, this time between Prophet Suleyman and the hoopoe bird, whose job was to find water for the formidable army, but who instead went somewhere else without permission.

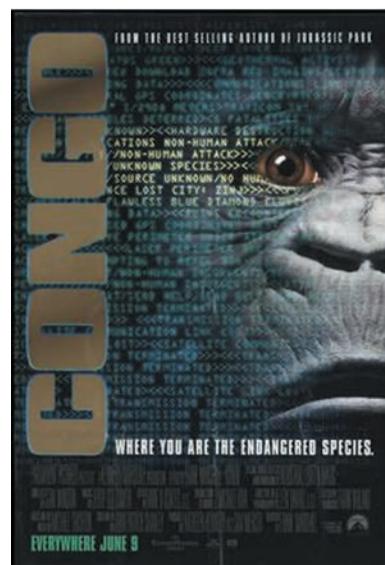
(On another occasion,) he inspected the birds and said: "How is it that I cannot see the hoopoe? Or is he among the absentees? I will certainly in-

flict a severe punishment on him, or maybe even kill him, unless he comes to me with a convincing reason (for his absence)." (27:20-21)

In verses that follow, we learn about the hoopoe bird's return, whose reasonable excuse the Prophet Suleyman accepts.

Speaking gorilla

Given this, I would like to make mention of the movie "Congo" (1995). It wasn't a particularly good movie, but I found the high-tech gorilla in the main role quite interesting. Amy, the name of the cute female gorilla, was trained to communicate using 620 words of sign language. These signs were translated into human speech by a translator attached to her arm. If I can recall correctly, Amy was expected to talk to other gorillas to search for King Solomon's treasure in the jungles of Africa. Even though "Congo," directed by Frank Marshall and written by John Patrick Shanley, has been criticized by countless movie reviewers, it receives my full credit for its inspirational and well thought out translation between different species: human and ape.



[https://en.wikipedia.org/wiki/Congo_\(film\)](https://en.wikipedia.org/wiki/Congo_(film))



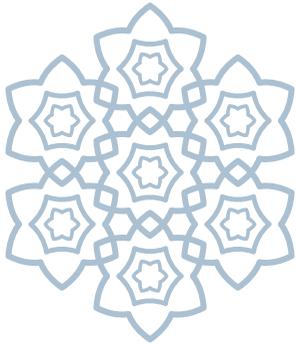
Universal translator

In the original “Star Trek” TV series, Captain Kirk never spoke a foreign language but was able to communicate with different life forms in the galaxy. He used a universal translator, a device that translates various languages by using his spaceship’s complex linguistic databases. The translator then instantly converted the language of all life forms in the universe into standard English. I wonder how much closer we are today to a universal translator than we were in the 1970s—a time when cell phones, iPhones, netbooks, laptops, the Internet, etc., were only part of our dreams. Similar to Captain Kirk and his crew, which bravely welcomed unknown space aliens in English, I expect that with the present ever-growing computing technology, we will sooner or later understand and perhaps talk to other life forms on this planet, including birds and dogs.

Linguistic expectations

Even though I support and appreciate research informing us about animal communication, such as the dancing of bees and the chemical language of ants, I find them unsatisfactory and encourage scientists to continue in their quest to crack the linguistic code of various life forms in this world. When we think of an entire bee colony, perhaps we should expect more from their communication and that it is not restricted to simply finding food, signaling directions, etc. Imagine what a universal translator, once invented, could tell us by converting all these animal signals into human speech. Its impact on human life will be unquestionably groundbreaking. For example, the ability to talk to animals could enable us to shed light on unsolved crimes, find lost people and children, and locate herbal medicine, among many other promising benefits. The more one contemplates, the more thrilling the idea of a universal translator becomes. What do you think?

Questions And Answers



PLURALISM

Q

How should
believers
approach
“pluralism”?





A

“Pluralism” is a concept more pronounced in modern times than at any other time in history. Yet, it did exist in the past—maybe not as a word but as a reality of social existence, especially in the early days of Islam. Believers back then welcomed different perspectives, ideas, and feelings, and approached others with understanding.

We need to note that it is not possible to reach absolute consensus in any society. It did not happen even among the companions of the Prophet, that elite group of people in the sight of God. Many of these companions thought differently about different matters; each of them had their own way of doing things. Take a look at the lives of Umar and Abu Dharr, or Abu Bakr and Bilal—they were so different from each other, although all of them were nourished from the same sweet source of water.

In the generations that followed, Muslim thought systems and lifestyles were established to a great extent on the foundations of the Scripture, the Prophetic tradition (*sunnah*), the consensus of scholars (*ijma*), and the principle of analogy (*qiyas*), in addition to secondary dynamics like custom, social benefit, and juristic discretion (*istihsan*). However, although believers designed their lives on these fundamental sources of knowledge, they still developed different solutions to the problems they encountered.

The pioneer scholars of Islam—like Imam Malik, Imam Shafii, and Ahmad ibn Hanbal—often offered drastically different rulings, even though they were teachers and students to each other. Imam Muhammad and Imam Abu Yusuf were students of Abu Hanifa, but many of their rulings contrasted with those of their teacher. This is mainly a human condition, for every individual is different in the way they approach, understand, and interpret events. These leading jurists centered their lives around the scripture and the Prophetic practice; given the huge differences between them, one can only imagine how big the gap could be among lay people.

Muslims have to face themselves before they accuse others. Because it is the failure of Muslims in the first place that they have not done enough so others could discover true Islam.



Believers have seen differences as a sign of Divine mercy, encouraging them to welcome differences with respect. Thus, they have been able to maintain integrity of their communities.

Developing a culture of coexistence

Striving to live with others in peace and harmony, despite major differences in lifestyles and beliefs, is as rewarding as worship. We usually have a negative reaction to what appears to be different. Subduing such negative feelings requires serious effort and willpower. The Prophetic tradition prescribes believers to live as a community, and not in isolation.

Establishing integrity and living in harmony as a pluralistic society is possible when members of the community learn to accept everyone as they are and approach differences with understanding. Approaching others with such a pluralist point of view is surely a manifestation of Divine mercy. The opposite of this is tyranny, or a form of despotism that rules with pressure and oppression and imposes a singular lifestyle on people. Such a rule threatens basic rights and freedoms; it surely crushes human potential and isolates people from the rest of the world.

Believers have to interact with different cultures and nations, lest they imprison themselves

in a small space and remain outdated. On the one hand, they need to introduce their own system of values to others; on the other hand, they need to learn and benefit from others.

Conflict, however, exists even among communities that share the same beliefs and cultural background. Given that this is a fact, conflict is more likely among communities that have fewer commonalities. To be able to establish a society with integrity, it is important to realize that we need to first adopt this culture of peaceful coexistence in our own lives and then seek opportunities to practice it. Principles like meeting with others on the common denominator of being human, coming together around things that we all agree on, looking for other possibilities that can build bridges across groups, and accepting people in their own positions are necessary for building a pluralistic society.

Some believers are concerned that pluralism may lead to compromise and erosion in certain religious values. This is why they are not sure how to engage with it, and some even go as far as to adopt antagonistic feelings about the “other.” These believers need to understand that they will not achieve anything by declaring war against members of other cultures and faith traditions. Believers should be in communication with others by holding them as precious as God holds humankind.

Seeing differences as richness

Accepting differences as a reality and establishing a pluralistic society based on this premise does not mean that we should not show our opposition against certain actions and thoughts. Living with others who have different worldviews does not mean that we should agree and approve of all of their thoughts. This goes both ways—they can oppose our thoughts, too. What matters is that these disagreements and oppositions should not lead to destructive clashes. To be able to maintain societal integrity and harmony, it may sometimes be necessary to leave behind certain points of disagreement and bring to the front points that we agree upon.

Every human deserves respect, simply for being human. Differences are a reality of being human. Accepting these premises, we need to act with realism and reason and do what needs to be done in a globalized world. This should not require anyone to forsake one’s own values. Believers should be able to practice their faith without

any hesitation, yet do so without imposing their values on anyone else. It is important to learn to live together while accepting our differences as an enriching component of our society.

In fact, encountering people from other traditions has often been an instrument of reinforcement. More than we assume, people usually show respect when it is time for you to pray and ask their permission to move to a quiet place. Mutual relations grow stronger when believers are confident and transparent in the way they practice their faith. Any provocative act, roughness, and radicalism should be avoided.

Some believers oppose pluralism, for they presuppose it is accepting all kinds of extreme perversity and immorality. As a matter of fact, some people consider it their democratic right to live as they like without observing any moral standard. What believers adopt and approve as right are evident. Yet, unless our rights or the rights of others and the public are violated, our disapproval of something does not necessitate us to declare war upon those who live without any moral standard. Prophet Muhammad, peace be upon him, lived with Meccan pagans, Medinan hypocrites, and Jewish tribes for a very long time, and he showed us how to live with differences in one community.

Does this mean we should not do anything against what we believe is wrong?

What we are pointing out here is not that we should be silent and do nothing. Believers need to be exemplary individuals, before anything else, and then voice their concerns according to the circumstances. Encouraging people to do right thing and warning them against the wrong is a major duty of believers, given that they do it by keeping people’s feelings in mind and without causing negative reaction. Unnecessarily crude or rough behavior in going against what we believe as wrong may prevent other good work that may restore our society in the future.

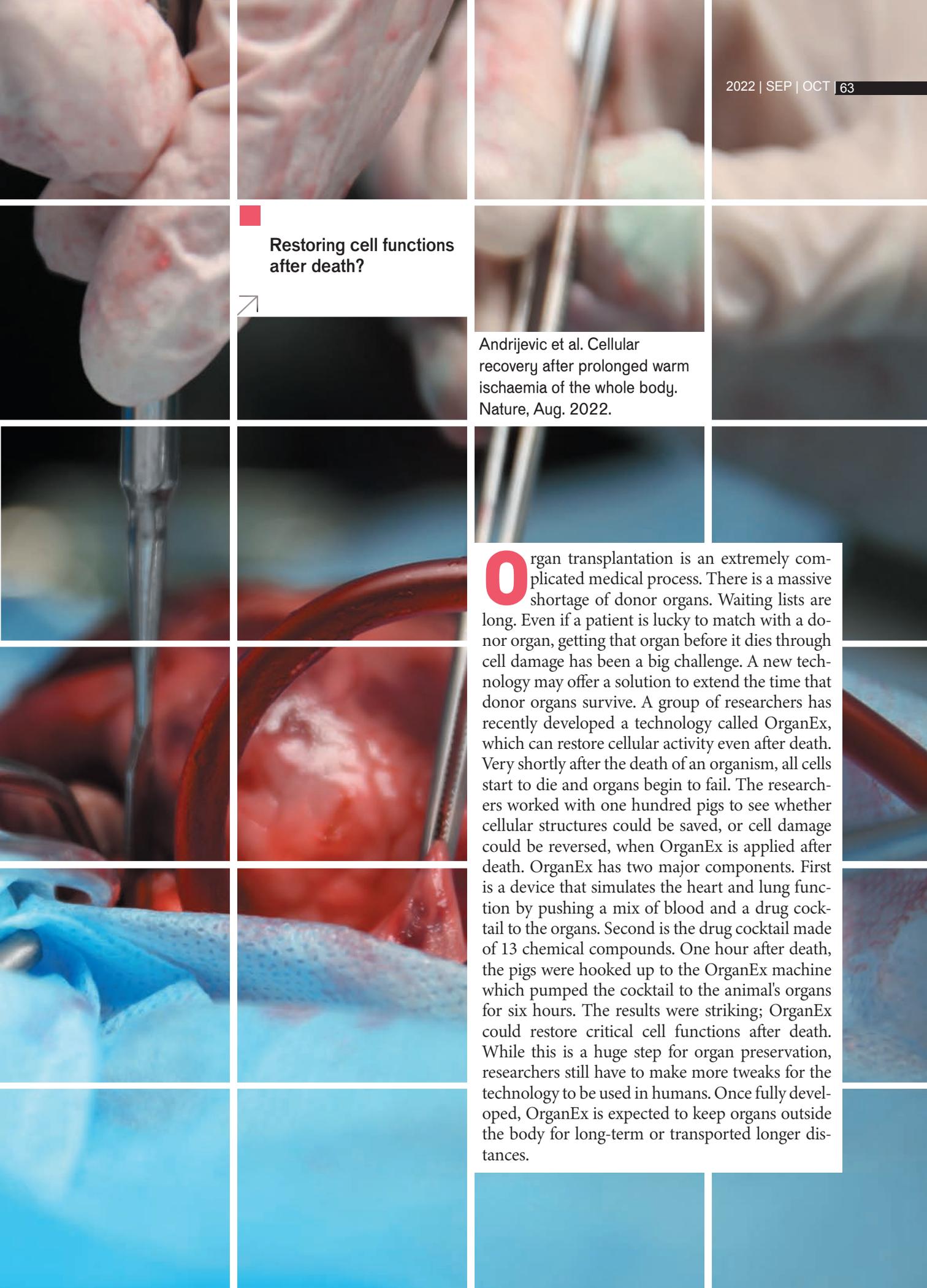
It is undeniable that there is an antipathy against Muslims in the Western world. Similarly, some Muslims have feelings of animosity against the West. Both of these harm a culture of peaceful coexistence. Muslims have to face themselves before they accuse others. Because it is the failure of Muslims in the first place that they have not done enough so others could discover true Islam.

SCIENCE SQUARE

Will et al.
Indigenous noble
gases in the
Moon's interior.
Science Advances,
Aug. 2022.

More evidence that
the moon came from
the earth

Humankind has always been fascinated with the Moon and studying it for nearly five centuries since Galileo. A recent discovery now adds new evidence to the currently favored "Giant Impact" theory which hypothesizes that the Moon was formed by a massive collision between Earth and another Mars-sized celestial body around 4.5 billion years ago. A group of researchers examined six samples of lunar meteorites collected in Antarctica using an exceptionally sensitive mass spectrometer and found that the meteorites contained noble gases like Neon and Helium, consistent with those found in the Earth's mantle. Researchers proposed two possible scenarios for how the noble gases became trapped in the Moon's interior. In the first scenario, impactors got mixed with the lunar mantle during cooling of the magma oceans to solidify over few million years of the Moon's formation. In the second scenario, the Moon has been formed from a debris field surrounding the Earth where noble gases were directly mixed into the Moon's interior mass. Discovery of noble gases on the moon may also inform us about its water content, too. If these gases are still there, then water could also be present in the Moon's interior. Such water resources could be an invaluable resource for future human missions. More broadly, this study suggests that a wide variety of life-forming material can survive giant impacts early in a planet's life. We now could make more reliable models of how planets and solar systems form and even how life is originated on the Earth.



Restoring cell functions after death?

Andrijevic et al. Cellular recovery after prolonged warm ischaemia of the whole body. *Nature*, Aug. 2022.

Organ transplantation is an extremely complicated medical process. There is a massive shortage of donor organs. Waiting lists are long. Even if a patient is lucky to match with a donor organ, getting that organ before it dies through cell damage has been a big challenge. A new technology may offer a solution to extend the time that donor organs survive. A group of researchers has recently developed a technology called OrganEx, which can restore cellular activity even after death. Very shortly after the death of an organism, all cells start to die and organs begin to fail. The researchers worked with one hundred pigs to see whether cellular structures could be saved, or cell damage could be reversed, when OrganEx is applied after death. OrganEx has two major components. First is a device that simulates the heart and lung function by pushing a mix of blood and a drug cocktail to the organs. Second is the drug cocktail made of 13 chemical compounds. One hour after death, the pigs were hooked up to the OrganEx machine which pumped the cocktail to the animal's organs for six hours. The results were striking; OrganEx could restore critical cell functions after death. While this is a huge step for organ preservation, researchers still have to make more tweaks for the technology to be used in humans. Once fully developed, OrganEx is expected to keep organs outside the body for long-term or transported longer distances.

Liu et al. Microbial biofilms for electricity generation from water evaporation and power to wearables. *Nature Communications*, July 2022.

Sweat-powered wearable electronic devices

Researchers have developed a biofilm that sticks to the skin like a Band-Aid to harness sweat for electricity that could power wearable devices. The biofilm is made using a type of bacteria called “geobacter sulfurreducens” known for its ability to produce electricity. In this biofilm design, bacteria convert energy from evaporation into electricity by using the moisture on a person’s skin. Most strikingly, researchers found that the biofilm bacteria do not need to be fed because they are dead! They do not need to be alive to produce electricity. The biofilm consists of thin sheets of bacteria colonies (thickness less than 0.1 millimeter) that is sandwiched between two mesh electrodes and sealed with a soft, sticky biopolymer to enable it to grip to the skin. Sticking this biofilm on your skin is like plugging in a battery. This technology has potential to revolutionize wearable electronics by solving the major problem of power supply. Moreover, this is a real green energy-driven device made naturally by the microbes and devoid of any unsustainably produced materials and toxic waste byproducts. The current version of the biofilm can produce enough energy to power small devices such as medical sensors or personal electronics, but the researchers hope to explore larger films that can power even more sophisticated devices.

A NOVEL

A Second Look

BY HANNAH MATUS

"A FASCINATING CONTEMPORARY ROMANCE NOVEL OF FAITH AND HOPE."

Sandra Drabik Collins, JD



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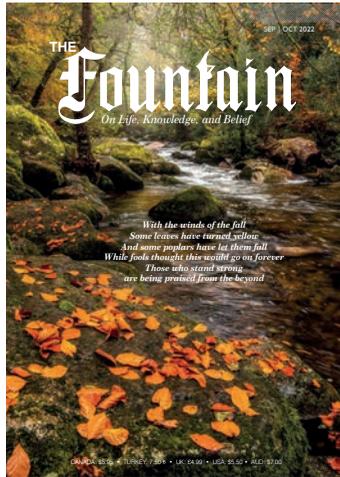
Caught in a struggle to navigate the often-conflicting demands of faith, career, and relationships, Elizza BenTaleb is a young Muslim woman in her final semester obtaining MBA. While dreaming to open up a clean energy business to help people in Libya on the one hand, she is trying to mother her four sisters, each divergent in their own ways – from uber-conservative to Insta-famous Hijabi – on the other.

Elizza's life takes a complicated turn when a successful Libyan businessman, Firas Tarseen, is hired for a semester to give lectures at the university. Elizza has some less than genial encounters with the fellow, but can't seem to avoid bumping into him everywhere. Can they overlook their first impressions of each other to realize that they may have more in common than they know?

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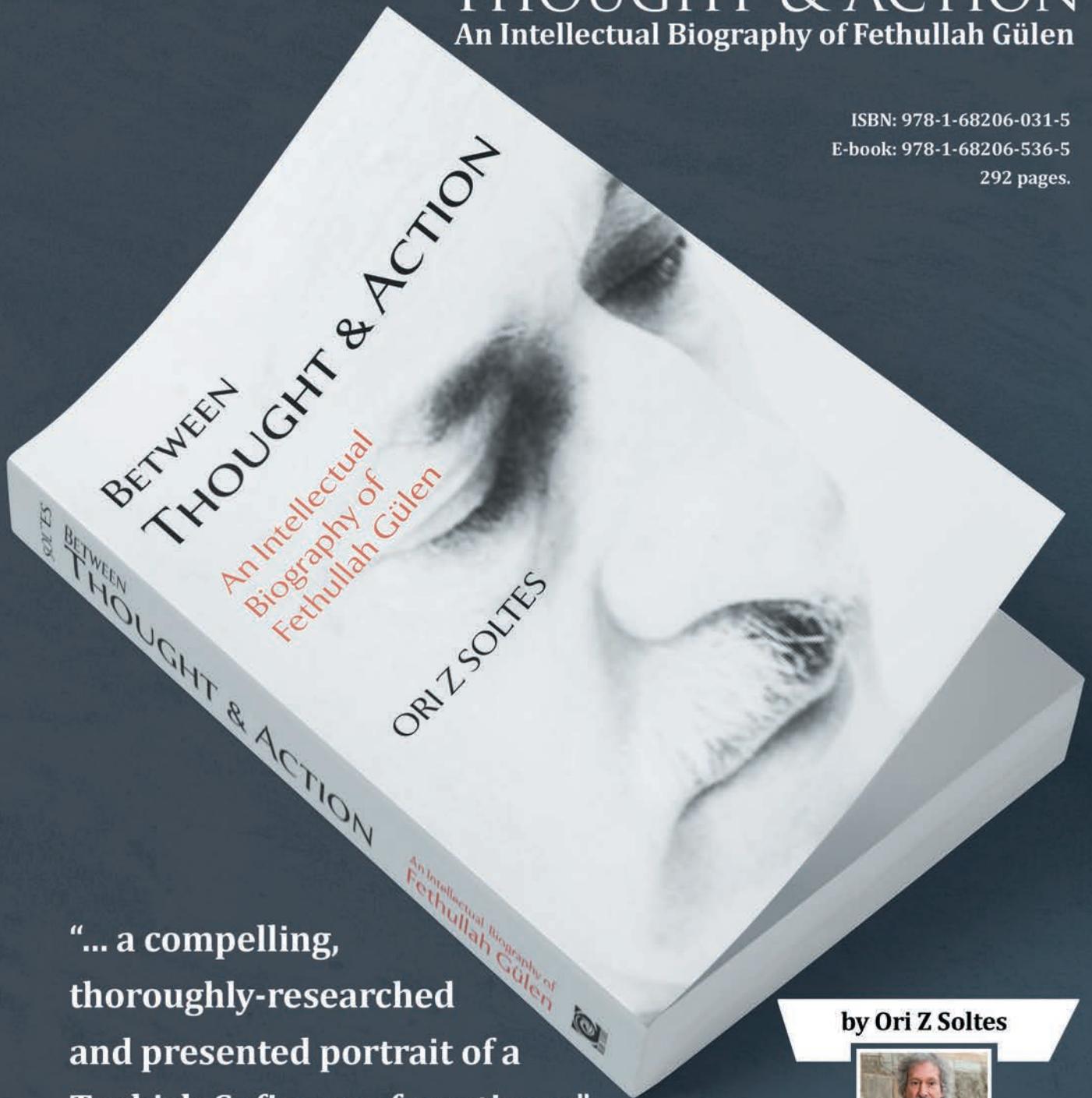
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