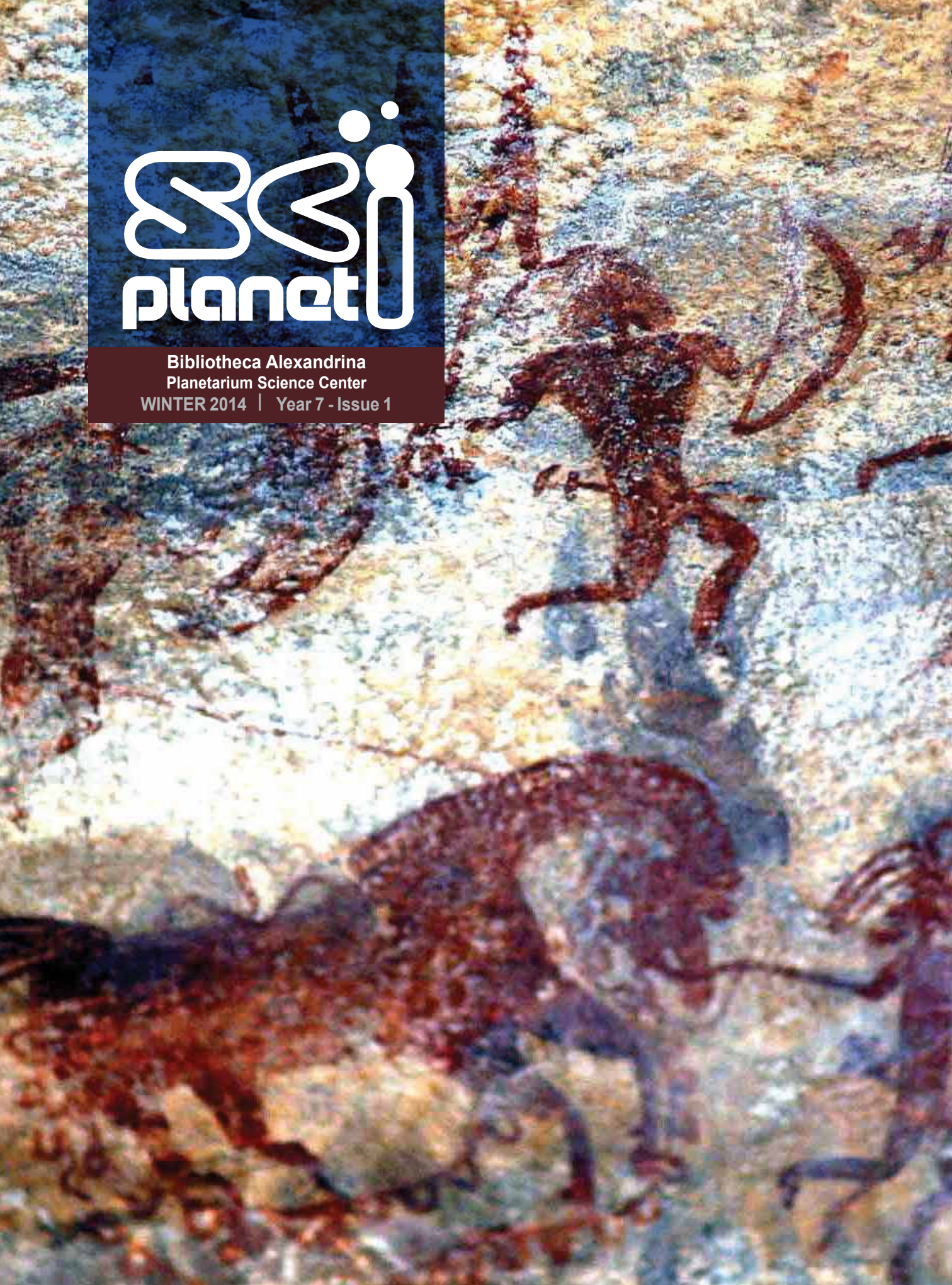

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IN THIS ISSUE...

HUMAN CIVILIZATION: THE RISE AND FALL

By: Maissa Azab

Plunging into a new phase, a new era, it is only appropriate to dig deep, to excavate the roots, to search for the beginnings of progress, of the future.

SCIplanet is the new phase for the PSC Editorial Team's quarterly popular science communication publication. For four years, the PSC Newsletter progressed, step by step, growing in innovation and content, with the growth of its contributing team of driven, enthusiastic and very talented young editors and designers; not just in number, but more importantly, in experience and ability.

Nevertheless, it is not just the new phase of this humble publication, but it is also a new phase for the Bibliotheca Alexandrina (BA), home of the Planetarium Science Center (PSC), the first Egyptian science center and the nest where this publication was incepted and this editorial team was born.

In this new phase, cultural outreach centers and departments have come together under the umbrella of the Cultural Outreach Sector. In addition to science popularization, the Sector covers fine, as well as expressive, art forms, antiquities, manuscripts, and francophone activities.

It is thus with great pleasure and honor that, in this issue, we debut a new phase of collaboration and intersection between the popularization of science and the humanities, always with the target of emphasizing the presence and essence of science in every aspect of our life.

This year, we will be privileged with contributions from Dr. Omar Fikry, PSC, p. 22; Dr. Mohamed Soliman, the Manuscripts Museum, p. 20; Gamal Hosni, the Art Exhibitions and Collections (AEC) Department, p. 23; in addition to the artistic illustrations of Mohamed Khamis, AEC.

Moreover, to crown this inaugural issue, our introductory article about the overarching theme is written by none other than Dr. Sahar Hamouda, Eminent Professor at the Faculty of Arts, Alexandria University, and Director of the Alexandria and Mediterranean Research Center (Alex Med).

In our diverse features and articles, we are tackling the theme of "Human Civilization: The Rise and Fall", from a variety of angles, in an attempt to find the root, the starting point of progress as our nation struggles to stand tall once more after centuries of decline from the pinnacles of glory to the depths of despair.

However, we also make a point of pinpointing the downsides of all previous rises, which eventually led to their falls. We attempt to open our readers' eyes to the calamity of ego, greed, and more dangerously, indifference; simply because we, Mankind, have run out of time and can no longer afford any of these despicable traits that can lead us up to the most glorious of glories, just to let us fall to the most tragic of tragedies.

Human life is nothing but contrast between the two; glory and tragedy, often going hand in hand. Nevertheless, human life is precious because it is unique; we have one shot at it. It is only logical to make this one shot meaningful; not just to ourselves, but to the world, to the future, to our children and grandchildren who will one day walk the Earth in the shadow of the legacy and heritage we leave them with.

Reflections on Human Civilization

By: Dr. Sahar Hamouda
Director
Alexandria & Mediterranean Research Center

Belonging to one of the oldest, and greatest, civilizations in the world, we rarely give the word "civilization" a thought, nor consider what it means to be one. We take it for granted, and form polarities, such as the lack of civilization in some parts of the world, or invite comparisons with our neighbors to the West such as the Carthaginians, or those to the East such as the Phoenicians.

What is it that makes one human community a "civilization" and the other not? Is it simply the monuments they leave behind? If there were no monumental remains, would that community not be a civilization?

Undoubtedly, monuments are an important index of civilization. Communities that have vanished off the Earth without leaving behind significant buildings are not considered civilizations. However, there are other equally important indices, some derived from the "civil" root of the word.

Civil law and civic administration regulate the life of the community and lead to a civilized life. Yet, though this is a pre-requisite for a "civilization", it is not that alone that makes "civilizations", since many nations were civilized but not civilizations. Is sheer size and duration sufficient?

The Ottoman Empire spanned several continents and centuries; it had civic administration, and the gems that stud the Bosporus are marvels of architecture, but one speaks of the Ottoman period rather than the Ottoman civilization.

What distinguishes a civilization from other nations that carry the above features is its contributions to humanity. If monuments still attract millions of tourists to wonder at the marvels of ancient peoples, it is the legacies that accompany these buildings that continue to influence people to this day.

The ancient Greeks, who never formed a real empire, and of whose monuments not much remains in Athens, are remembered for more intangible contributions. Democracy and the exercise of political rights, which are our birthright today, were born in ancient Greece. Literary forms such as tragedy and lyric poetry, also born in ancient Greece, continue to nourish our souls and provide unparalleled pleasure.

Yet, another contribution is freedom of thought. The liberation from dogma allowed Man's mind to find rational answers to perennial questions and to the rise of philosophy. These achievements, which the ancient Greeks bequeathed mankind, were carried on with the Romans and laid the foundations of Western civilization.

Art, then, and literature, music, philosophy, science, mathematics, these are the contributions that have improved the human condition materially and morally, and determine whether or not a society was worthy of being celebrated as a civilization or not.

No greater example exists than ancient Alexandria. Its Pharos, one of the Seven Wonders of the Ancient World, has disappeared beneath the waves, and so have its famed Library and Mouseion. Not a trace remains of the white marble city of Cleopatra. Yet, no city has exercised a fascination for thousands of years such as Alexandria.

The legacy it has left mankind has excited the imagination of generations who continue to study its achievements, and to try to capture that magic in diverse forms of art. Alexandria endures, not because of its visible remains, but because of the ways it has formed our lives.

The BIG BANG

The Beginning of All Beginnings

By: Moataz Abdelmegid

Incredible creatures living on a unique planet, circling a beautiful star clustered together with several hundred billion other stars in a galaxy soaring through the cosmos, all of which are within an expanding universe that began as a minuscule "singularity" that appeared out of nowhere. This is the Big Bang Theory.

The Big Bang Theory tries to explain or describe the change from nothingness and no time to the existence of a Universe filled with space and marked by time.

Our Universe is thought to have begun infinitesimally small, infinitely hot, and intensely dense. Following the Big Bang, the immense heat created conditions unlike any conditions astrophysicists see in the Universe today. While planets and stars today are composed of atoms of elements such as hydrogen and silicon, scientists believe that our Universe back then was too hot to endure anything other than the most fundamental particles, such as quarks and photons.

Following the initial appearance of the Universe, it apparently inflated, expanded, and cooled, going from being extremely small and hot, to the size and temperature of our current Universe. It continues to expand and cool to this day as we live within it.

Misconceptions

We tend to imagine the Big Bang as a giant explosion. Experts, however, state that there was no explosion; there is an expansion that continues since then. Rather than imagining a balloon popping and releasing its contents, imagine a balloon expanding; an infinitesimally small balloon expanding to the size of our current Universe.

The Big Bang was like no explosion you might witness on Earth today. For instance, a hydrogen bomb explosion, whose center registers approximately 100 million degrees Celsius, moves through the air at about 300 m/s. In contrast, cosmologists believe the Big Bang flung energy in all directions at the speed of light—300,000,000 m/s, a hundred thousand times faster than the H-bomb—and estimate that the temperature of the entire universe was 1,000 trillion degrees Celsius at just a tiny fraction of a second following the explosion.

Within this misconception, we tend to image the "singularity" as a little fireball appearing somewhere in space. According to the many experts however, space did not exist prior to the Big Bang.

Back in the late 1960s and early 1970s, when Man first walked on the Moon, three British astrophysicists—Steven Hawking, George Ellis, and Roger Penrose—turned their attention to the Theory of Relativity and its implications regarding our notions of time. In 1968 and 1970, they published papers in which they extended Einstein's Theory of General Relativity to include measurements of time and space.

According to their calculations, time and space had a finite beginning that corresponded to the origin of matter and energy. The singularity did not appear in space; rather, space began inside of the singularity. Prior to the singularity, nothing existed, not space, time, matter, or energy, literally nothing.

So, where did the singularity appear if not in space? We do not know yet.

Evidences

First of all, we are reasonably certain that the Universe had a beginning. Second, galaxies appear to be moving away from us at speeds proportional to their distance. This is known as "Hubble's Law", named after Edwin Hubble (1889–1953) who discovered this phenomenon in 1929. This observation supports the expansion of the Universe and suggests that it was once compacted.

Third, if the Universe was initially extremely hot as the Big Bang suggests, we should be able to find some remnant of this heat. In 1965, Radio astronomers Arno Penzias and Robert Wilson discovered a −270°C Cosmic Microwave Background radiation (CMB), which pervades the observable Universe. This is thought to be the remnant that scientists were looking for. Penzias and Wilson shared the 1978 Nobel Prize for Physics for their discovery.

Alternatives

The Big Bang is not the only plausible theory though; it is just the most popular one. In 2003, Physicist Robert Gentry proposed an attractive alternative to the standard theory, which also accounts for the evidences listed above.

Dr. Gentry claims that the standard Big Bang model is founded upon a faulty paradigm, the Friedmann–Lemaitre expanding spacetime paradigm. Instead, he bases his model on Einstein's static-space-time paradigm, which he claims is the "genuine cosmic Rosetta".

People might wonder about the importance of finding out how the Universe was created. Well, finding out where and how it all began is the only way we can understand the evolution of this Universe we inhabit, and maybe, learn a thing or two about how it might go from here on.

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SALLY RIDE
A Space Pioneer

By: Omar Raafat

We are all familiar with Neil Armstrong and Yuri Gagarin, among other famous male astronauts. However, few of us know about female astronauts, one of whom is Sally Ride, the first American female to orbit the Earth.

Sally Ride was born on 26 May 1951, in Los Angeles, California. When she was ten, she began playing tennis, a sport at which she particularly excelled. Following graduation, she enrolled at Swarthmore University in Pennsylvania, but soon doubted her choice.

Determined to find out, she left Swarthmore after her first year to see how far her tennis game would take her. After three months of intense training, she concluded that she would not have a professional athletic career, and thus enrolled at Stanford University in Palo Alto, California.

Sally graduated with a bachelor's degree in both English and Physics, and remained at Stanford to earn her Master's and PhD degrees in Physics. As a graduate student, she carried out research in astrophysics and free-electron laser physics.

In 1978, Sally was completing her PhD when she saw an advertisement by NASA, seeking recruits for the astronaut corps. She was one of more than 8,000 applicants for only 35 positions, but she made the cut, and was one of six women only accepted for astronaut training that year.

After her initial training period, Sally served as Communications Officer for the second and third shuttle flights. She was also assigned to the team that developed the Shuttle's mechanical robot arm, designed to deploy and retrieve satellites.

Sally's mission in 1983 was the second flight for the vehicle known as "Challenger". Over the course of the six-day mission, the crew used the robot arm in space for the first time, retrieving one satellite from orbit and releasing another.

In 1984, Sally returned to space in the Challenger as a Mission Specialist. It was a mission for eight days, during which a new satellite was deployed, observations of the Earth had been made with new large-format cameras. Over the course of these two missions, Sally Ride had logged more than 343 hours in space.

On 28 January 1986, the Challenger fell to pieces a few minutes after taking-off; the entire crew perished in the catastrophe. Preparation for further missions was immediately suspended, and Ride was appointed to the Presidential Commission investigating the accident.

When the investigation was complete, Ride was assigned to NASA's Washington headquarters as a Special Assistant to the Administrator for long-range and strategic planning. She led the Agency's first strategic planning effort, and wrote the report "Leadership and America's Future in Space". Before leaving NASA in 1987, she founded the Agency's Office of Exploration.

For the first two years after leaving NASA, Ride was a Science Fellow at Stanford University's Center for International Security and Arms Control. In 1989, she was appointed Professor of Physics at the University of California, San Diego, and Director of the University's California Space Institute.

Over the years, Sally Ride became concerned with the under-representation of women in science. Since boys and girls display equal enthusiasm for science in the early grades, Ride focused her efforts on the promotion of science in the middle grades, when girls in particular often drift away from the study of science.

She wrote a number of books on space exploration for younger readers, including her memoir *To Space and Back; The Third Planet: Exploring the Earth From Space; Exploring Our Solar System; Voyager: An Adventure to the Edge of the Solar System and The Mystery of Mars*.

In 1999 and 2000, Ride served as President of Space.com, a website concerning all aspects of the space industry. She then initiated NASA's Internet-based EarthKAM project, enabling middle school students to shoot and download images of the Earth from space.

In 2001, she founded her own company, Sally Ride Science, a company to create entertaining science programs and publications for students in middle school and the upper grades of elementary school. The Company sponsored Sally Ride Clubs for girls at schools across the country, and Sally Ride Science Camps at a number of college campuses.

As great as were her own accomplishments in space exploration and astrophysics, Sally Ride's most enduring legacy may lie in the cumulative achievement of subsequent generations of young scientists, male and female, that she fostered and inspired.

Sally Ride passed away of cancer in 2012, at the age of 61. The year following her death, she was posthumously awarded the nation's highest civilian honor, the Presidential Medal of Freedom.

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SALLY RIDE

THE INDUSTRIAL
AND THE WAVES OF CHANGE

Although the world had witnessed technological breakthroughs before, nothing compares to the scope and pace of the Industrial Revolution, which had cultural and social ramifications that shaped the new age of advancement. It was a revolution in the sense that new technologies took over old ways at a quick pace, with each newer development changing people's lives and making it much easier.

One may wonder why these developments occurred where they did. It started in Britain during the mid-18th century, but it was not long before it made its way to Europe and North America.

Not only was Britain ready financially and scientifically, it was also ready politically. Unlike its neighbors, it did not have an absolute monarchy that would hamper its development. Instead of its capital being used on maintaining a lavish monarchy that drained its coffers, the money went to projects that would improve industries, create jobs, and encourage scientific research.

Europe, as a continent, was wealthier than other nations due to its capitalizing on wealth brought in from the colonies; with this capital they invested in new technologies. Of the European nations, each country competed to build better equipped armies and have stronger economies, giving incentive for a quicker pace of development. With the differences in scientific thought, each country developed differently; the diverse modes of scientific thinking led to different scientific discoveries and developments.

The advancements made applied to different industries, but the driving force of the Revolution was in the textile and mining industries. Technological breakthroughs were made in the substitution of human skills by mechanical devices.

Many machines were being introduced, allowing the production of bigger quantities in a shorter amount of time. There were also substitutions in the power department; instead of relying on humans and animals to provide it, steam power was introduced and this added to the efficiency of the work being done.

With the technological shift came also a shift in the way things were done. Work was transformed from being something you have to be skilled at and trained for to something anyone can do. This applied to factory work; since a product passed through many phases before it was finished, each worker had one specific task to do, day in and day out.

Although this made work monotonous and decreased creativity, it increased production efficiency, and allowed a bigger number of products to enter the market at affordable prices, which in turn gave more and more people access to an easier way of life.

Steam machinery used in factories started to be used in transportation as well. Trains and cars started to run with steam engine, revolutionizing the way people and goods were transported. With more ease in transportation due to the expanding railroad systems, goods were easily transported from one location to another, and with that ease of distribution came the development of national as well as international markets, creating a new economic system.

Travelling also became much easier with the introduction of different modes of transportation technologies. For the first time people were able to travel long distances in a much more comfortable manner. Steamships, automobiles, as well as airplanes, entered the arena and were much more reliable than their predecessors. For the first time, people started travelling for pleasure; it was then that tourism started to emerge as a leisure activity.

Not only could people move at a faster pace, so could information. With the introduction of telegraphs, telephones, and radios, information passed from one person to another directly with a speed hitherto unknown. No longer did people have to wait for days or maybe weeks and months to hear news of loved ones or find out about an event that took place elsewhere. Information passed on with ease and this was the beginning of a faster pace of life all around.

Just like transportation, with new factories opening up to produce steel and iron, buildings started changing as well in how they were constructed. The face of Europe was quickly changing and it soon donned on a new garb, that of technological advancement.

All these changes of course had consequences. Yes, life became easier and more comfortable on the individual

REVOLUTION

By: Jailane Salem

level; however, all these changes took their toll on the environment.

Before the Industrial Revolution, the pollution resulting from human activity could be easily absorbed and dealt with. People grew their own food, packaging of goods was not as disposable, fossil fuels were not used; all in all the human population was not as large and did not over-consume as we do nowadays.

With the technological changes, people's usage of non-renewable energy increased, electricity entered homes, transportation emitted fumes, factories created a lot of waste, and so on. With the expansion of the Earth's population, and the increasing reliance on goods and machines, the environment was negatively affected.

However, the negative effects of mass production did not make its presence known except later on. One of the major issues caused by the Industrial Revolution was deforestation. It occurred because building factories required large plots of land, and in order to get those, natural areas had to be cleared to make way for the foundations of factories.

The clearing of forests spelled many problems; the destruction of animal habitats, as well as the risk of flooding if heavy rain occurred, leading to landslides if the land layout was prone to that and affecting the climate of the area. All these changes were permanent and ended up leaving behind a damaged environment.

While trees and plants emit oxygen and help maintain balanced levels of gases in the air, factories do the complete opposite. Factories produce poisonous emissions and eliminate the source of oxygen. Air, of course, is not the only thing being polluted; land and water also suffer the same deplorable fate.

Factories always treat chemicals, which result in unnecessary residues that are dumped into the nearest water supply; as a result, many rivers lost their aquatic life. Humans are also harmed by this water pollution, since we use water daily; having the water source polluted leads to many health issues. Land also got polluted and its soil eroded, preventing it from ever being useful again.

The main issue resulting from pollution and carbon emissions is global warming. With the rise of temperatures, glaciers are melting, causing sea levels to rise, which creates a problem for low lying areas, especially islands in the middle of the ocean such as the Maldives. Not only is land being threatened, but so are animals whose habitats are changing, leading to their becoming endangered species.

Unfortunately, from the beginning of the Industrial Revolution until the 1990s there was no agreement between countries to regulate the pollution created by factories and industries. In 1992, an agreement between nations was finally negotiated so as to regulate pollution.

The Kyoto Protocol was the first agreement between nations to mandate country-by-country reductions in greenhouse gas emissions. It emerged from the UN Framework Convention on Climate Change, which was signed by nearly all nations at the 1992 meeting, popularly known as the Earth Summit. The framework of the agreement pledges to stabilize greenhouse gas concentrations "at a level that would prevent dangerous anthropogenic interference with the climate system".

In order to ensure the pledge is taken seriously by everyone involved, a new treaty that had binding targets for greenhouse gas reductions was drafted. That treaty was finalized in Kyoto, Japan, in 1997; after years of negotiations, it went into force in 2005.

Nearly all nations have now ratified the treaty, with the notable exception of the United States even though it contributes greatly to the pollution of the Earth's atmosphere. Developing countries, including China and India, were not mandated to reduce emissions, given that they had contributed a relatively small share of CO_2 emissions because their industrialization began at a later stage.

Under Kyoto, industrialized nations pledged to cut their yearly emissions of carbon, as measured in six greenhouse gases, by varying amounts, averaging 5.2% by 2012 as compared to 1990. That equates to a 29% cut in the values that would have otherwise occurred.

However, the protocol did not become an international law until more than halfway through the period 1990–2012; by that point, global emissions had risen significantly. Some countries and regions, including the European Union, were on track by 2011 to meet or exceed their Kyoto goals, but other large nations were falling extremely short.

The two biggest emitters of all—the United States and China—emitted more than enough extra greenhouse gas to erase all the reductions made by other countries during the Kyoto period. Worldwide, emissions soared by nearly 40% from 1990 to 2009, according to the Netherlands Environmental Assessment Agency.

The Industrial Revolution was the beginning of the world as we know it. However, with all the wonderful changes, people became more and more independent on materialistic things, and the mentality of disposability became the norm. We no longer process how something is made; when we no longer find it useful or interesting we throw it away without a thought as to how this affects our environment.

Our disastrous habits have depleted the Earth's resources. What began as the triumph of human ingenuity could very well be the spelling of its end if we do not redress all the harm we have created.

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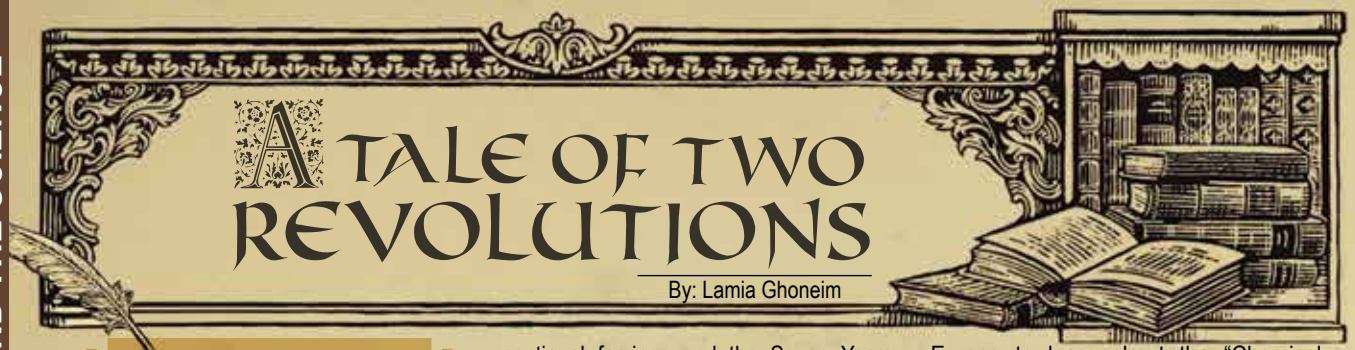

A TALE OF TWO REVOLUTIONS

By: Lamia Ghoneim

Antoine Laurent Lavoisier discovered and named Oxygen and Hydrogen. He was also the first man to put together an extensive list of elements that brought about complete reformation to chemical nomenclature.

He was also the man who constructed the most important law in chemistry, the Law of Conservation of Mass; for that and all his accomplishments he was named the "Father of Modern Chemistry", and the leader of the "Chemical Revolution".

Yet, in spite of all his contributions to the world of science, he could not escape his tragic fate; the proclaimed "traitor" who lost his head at the guillotine of another revolution he played no part in, the French Revolution.

"It was the best of times, it was the worst of times"(1)

It was the era of extremes; the times when the co-existence of immense wealth and agonizing poverty was the norm of the world, and France was the pinnacle of such opposing extremes. It was also the era of "Enlightenment"; the times when scientific thinking flourished throughout Europe, setting aside tradition and outdated beliefs in exchange for science and reason.

French salons were brimming with intellectuals full of revolutionary ideas, scientists who felt that the only way to move forward was through knowledge and learning. They believed that one of the most important tasks that lay ahead of them was to rationalize and classify every single kind of matter, to see how they all interacted together to form the elements of this world.

Born in 1743, the year when King Louis XV began his controversial reign of France, Antoine Lavoisier was the son of a wealthy aristocratic Parisian family; bourgeois in the eyes of poor French peasants facing continual famines and the Seven Years War.

When he was eleven years old, he began his schooling at the highly regarded Collège Mazarin in Paris, where he received a sound training in arts and classics, and an exposure to science that was the best in his time. During his final two years in college, his interest in science became apparent, fuelled by the distinguished scientists he studied under.

However, just as a dutiful aristocratic son should, Lavoisier yielded to the influence of his father, forgoing his scientific studies to study law. Eventually though, his interest in science prevailed, rekindled by the geologist Jean-Etienne Guettard. He then began a long collaboration with Guettard on a geological survey of France, where he helped develop the first geological map of France and the main water supply of Paris.

"I am young and avid for glory"(2)

Young Lavoisier had extraordinary logical capabilities, and an early inclination for precision and scrupulous quantitative measurements. Although a polymath by nature, chemistry was his ultimate passion, and he soon began applying his interest in chemistry and his meticulous quantitative skills to the analysis of geological samples, especially gypsum.

Lavoisier was elected to the Academy of Sciences, France's most elite scientific society in the year 1768. This was the same year when he, faced by the high costs of his scientific work and research, decided to use part of his fortune to invest in the Ferme Generale, a privatized tax group that collected taxes for the Crown on a profit and loss basis, a decision that eventually placed him on the wrong side of the French Revolution and at the foot of the guillotine.

In 1775, Lavoisier was appointed a commissioner of the Royal Gunpowder and Saltpeter Administration, and took up residence in the Paris Arsenal. There, he equipped a fine laboratory, which attracted young chemists from all over Europe to learn about the "Chemical Revolution" that was now set in progress.

"In nature, nothing is created, nothing is lost, and everything changes"(3)

At that time, chemistry could hardly be called a true science. Unlike physics, which had come of age through the work of Isaac Newton a century earlier, chemistry was still mired in the legacy of the Greek philosophers and alchemy roots.

Thrown into this mix was the dominating principle of phlogiston. Developed by the German scientist Georg Ernst Stahl, Phlogiston was a substance believed to be emitted during combustion and the calcination of metals.

Stahl assumed that a metal was composed of calx and phlogiston, and that burning resulted from the loss of phlogiston. The fact that metals actually gained weight during combustion was usually explained through the theory that phlogiston had negative weight.

Lavoisier, who believed in reason before anything else, considered that it was illogical for anything to have negative weight. To prove his supposition that phlogiston did not exist, Lavoisier introduced quantitative measurement to the laboratory.

He carried out numerous experiments with phosphorus and sulfur; using precise weighing, they showed that, in all cases of combustion, an increase in weight was observed and air was absorbed, and that, when a calx was burned with charcoal, air was liberated.

Although Lavoisier now proved that combustion actually involved air, the exact composition of air at that time was not clearly understood. This was when his meeting with English natural philosopher Joseph Priestley came in handy.

Priestley described to Lavoisier how he had recently heated mercury calx—a red powder—and collected a gas in which a candle burned vigorously. Priestley believed his "pure air" enhanced respiration and caused candles to burn longer because it was free of phlogiston.

For this reason, he named the gas that he obtained from decomposing mercury calx "dephlogisticated air".

In Paris, the intrigued Lavoisier repeated Priestley's experiment with mercury and other metal calces. He eventually concluded that common air was not a simple substance. Instead, he argued there were two components: one that combined with the metal and supported respiration, and the other an asphyxiant that did not support either combustion or respiration.

By 1777, Lavoisier was ready to propose a new theory of combustion that excluded phlogiston. Combustion, he said, was the reaction of a metal or an organic substance with that part of common air he termed "eminently respirable".

Two years later, he announced to the Royal Academy of Sciences in Paris that he found most acids contained this breathable air. Lavoisier named it *oxygène*, from the two Greek words for acid generator.

He did not stop at that; his findings also implied what he for long had suspected: "that nature is a closed system; that in any transformation, no amount of matter—no mass—is ever lost, and none is gained." For a very long time, Lavoisier had suspected that the exact amount of matter, the mass, involved in any transformation was always conserved.

To prove this, he had to carry out thousands of experiments, and he had to calculate the measurements with incredible accuracy. That was where his great wealth from being a tax collector came in; he could afford to commission the most sensitive instruments ever built.

For years, Lavoisier burned, chopped, melted and boiled every conceivable substance. He had shown that as long as one is scrupulous about collecting all the vapors, liquids and powders created in a transformation then mass is not decreased. Liquids might become gases, metals may rust, wood may become ash and smoke; but matter, the tiny atoms that make up all substances, none of it is ever lost.

He successfully constructed the most important law in Chemistry; the Law of Conservation of Mass. The crowning glory of this opus was his remarkable use of static electricity to create oxygen and "inflammable air", which he now termed hydrogen, to recombine back into water.

During the course of his work, Lavoisier wrote several books explaining his theories. In *Réflexions sur le phlogistique* (1783), he wedged his full attack on the phlogiston theory; in *Methods of Chemical Nomenclature* (1787), he invented the system of chemical nomenclature still largely in use today, including names, such as sulfuric acid, sulfates, and sulfites.

His *Traité Élémentaire de Chimie*—Elementary Treatise of Chemistry—(1789) was the first modern chemical textbook, presenting a unified view of new theories of chemistry, and containing a clear statement of the Law of Conservation of Mass. In addition, it contained the first ever list of elements that could not be broken down further, which included oxygen, nitrogen, hydrogen, phosphorus, mercury, zinc, and sulfur, amongst others.

"The wall surrounding Paris is making Paris grumble"[4]

While Lavoisier was busy leading "The Chemical Revolution", another revolution was steadily gaining momentum. The people of France were fed up with the Ancien Régime that was leaving them hungry, and bleeding them dry with taxes, and they were plotting for its downfall.

It is difficult to assess Lavoisier's own attitude towards this political turmoil. Like so many intellectual liberals, he felt that the Ancien Régime could be reformed from the inside, if only reason and moderation prevailed. In fact, in his involvement with the Government he had proposed many reforms; the only idea which Lavoisier proposed that the Government did accept worked out to his ruin.

For years, smugglers were easily trafficking goods into Paris without paying the required taxes. To stop them, Lavoisier suggested that they build a wall around Paris. His wall was disliked by the Parisians, who felt that it was imprisoning and suffocating them, and it further fuelled their anger against the regime.

In 1789, the storming of the Bastille and the French Revolution started. A year later, Lavoisier complained that "the state of public affairs in France has temporarily retarded the progress of science and distracted scientists from the work that is most precious to them".

Indeed, the violence and anger of the Revolution had taken its toll on scientists; in 1792, Lavoisier was forced to resign from his post on the Gunpowder Commission and to move from his house and laboratory at the Royal Arsenal. On 8 August 1793, all the learned societies, including the Academy of Sciences, were suppressed.

For Lavoisier, the fact that he sat on a number of aristocratic committees that were deemed to have been set up to maintain their standard of living at the expense of the poor did not help his case. Moreover, his obsession with accuracy, which might have been the pillar of his success, gained him a powerful enemy.

Jean-Paul Marat, a leading figure in the "Reign of Terror", who was also a failed scientist, was previously denied membership of the *Académie des Sciences* by Lavoisier because his work was not up to standard. As an adamant revolutionary filled with envy and the need for revenge against Lavoisier, Marat set to publicly denounce him in January 1791, belittling his accomplishments and portraying him only as the man who was an investor in the Ferme Générale that had bled white the poor.

By then, the French revolutionaries could only see Lavoisier as the despised tax collector who had built the wall around Paris.

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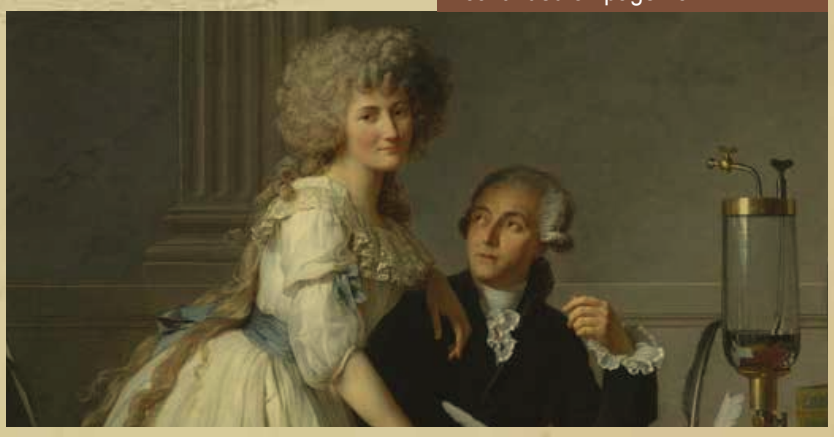

The Uncontacted

By: Jailane Salem

Living in urban areas conditions us to a lot of things: big buildings, loud noises, traffic, crowds, markets, and so forth. Our lives' rhythms follow the drum beats of modernity and all its entrapments; the lifestyles we have are shaped by our surroundings. If we leave the city behind to go to the countryside, we will witness a largely different lifestyle.

Before radio and television were introduced and became an integral part of our daily life, you might have found rural communities to be more reclusive and less up to date with the outside world. This has changed with the integration of devices that feature news and stories from all over the world, reaching even the most remote of areas.

People are now more familiar with different cultures, and are more informed of world events and news than they ever were before; but are there people out there who are still unaffected by the changes and developments that have occurred over the past centuries? The answer is "Yes".

There are still people who live in remote areas where they have been able to escape contact with the developing world, and continue to live in the same manner their ancestors have. They are commonly known as "uncontacted peoples" but can also be referred to as "isolated peoples"; these communities have either shunned contact with others or due to their circumstances have so far escaped making contact with the outside world.

There are about one-hundred "uncontacted" tribes in the world. These communities are usually located in densely forested areas in South America, New Guinea and India. We have come to know of their existence through aerial footage, and rare encounters with other people or tribes.

Many people view these uncontacted tribes with fascination; some tour operators started offering adventure tours to search and find them. This is viewed as unethical behavior by Survival International, which campaigns on behalf of tribal peoples. The Charity's Director, Stephen Corry, said: "We are now in the 21st century, not the 19th; colonialism should be a thing of the past. Tribes are not cultural relics, nor should they be treated like animals in a zoo."

The problem uncontacted peoples face is not only this invasive attitude from tour operators who are out to make money at their expense, and irresponsible travelers who want to satisfy their curiosity no matter the cost, but the areas where these communities live are also under threat by loggers who move in on the land illegally.

The forests of the Amazon is home to several isolated tribes; when bulldozers come to cut down trees, the noise and the machines scare the tribes away, sending them running for dear life, leaving behind their homes and the crops they were planting, and causing them great fear.

Those who work to protect these tribes see it as the government's job to protect them, since it is the outsiders who are encroaching on those tribes' lands and not the other way round. "The destiny of these uncontacted tribes is not in their hands, it is in ours. Their future existence depends on us, and what the Government of Brazil and Peru are going to do with the Amazon region. If we do not protect it, these people will soon be gone, and the world will be a sad place," said Meirelles, FUNAI, Indian researcher.

There are uncontacted tribes in India; one of them lives in North Sentinel and is known as the Sentinelese. They continue to resist contact with outsiders; if they see an outsider coming, they usually attack. In 2004, after the tsunami, they made the headlines; as a helicopter was surveying the area, a member of the tribe came out and fired arrows at the helicopter.

The Sentinelese hunt in the forest, and fish in the coastal waters. They live in long communal huts with several hearths, and use outrigger canoes to travel the seas around their island. They are more isolated than other tribes because they live on an island, and shun any contact with others.

They are thought to be directly descended from the first human populations to emerge from Africa; they have most probably lived on the Andaman Islands for up to 60,000 years. Their language is extremely different from other Andaman islanders, which could be evidence that they have not been in contact with other people for thousands of years.

The Sentinelese have been incorrectly described as being savages and backward; however, this is not accurate. They may live in a manner that would seem outdated and primitive to some, but they have adapted to the changes they face; for example, they can make tools and weapons from metal that washes up from shipwrecks onto the island's shores. This shows that they can adapt their skills when the need arises, and their hostility to outsiders is understandable.

Pressure from Survival and other organizations has led the Indian Government to change its policy towards the Sentinelese. They initially wanted to

establish contact with them and have made several unsuccessful attempts. Now they recognize this policy was disastrous; when they made contact with other isolated tribes, these tribes suffered adverse results because they were not immune to many of the diseases frequently contracted by us, such as colds and flues, which ended up killing them. Now the Government realizes that it is the Sentineleses right to live the way they wish to, without any interference.

One of the activists who works to protect these tribes said an interesting phrase I think everyone should mull over; he said they are the "last free people on Earth". When one thinks of how enslaved we are to all modern entrapments that dictate our lives, I believe there is truth to what he said.

This is why it is crucial that we protect these "uncontacted" people; their lives can be seen as the alternative to our way of life, and it shows that there is no one way for doing anything.

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ATLANTIS
THE LOST CIVILIZATION

By: Moataz Abdelmegid and Hend Fathy

FACT OR FICTION

Unlike many legendary stories the origins of which have been lost, we know when and where the story of the Lost City of Atlantis first appeared; in two of Plato's dialogues, the *Timaeus* and the *Critias* written about 330 BCE.

According to Plato, Atlantis was located somewhere in the Atlantic Ocean; it was a great naval power that conquered most of the known world, only Athens remained. In a major battle, the Athenians beat the Atlantians and sent them back home. It is said that the very next day, Atlantis was struck by a massive catastrophic disaster, causing it to sink into the ocean and disappear.

Unfolding the mystery of Atlantis has inspired quite a big number of studies, explorations, books, fiction, and movies.

Early Writings

The *Timaeus* remained known in a Latin rendition through the Middle Ages, and an allegorical aspect of Atlantis was taken up by Humanists in utopian works of several Renaissance writers, such as Sir Thomas More's *Utopia* (1516) and Sir Francis Bacon's *New Atlantis* (1624).

More describes an imaginary land set in the New World, establishing a connection between the Americas and utopian societies. This theme was further solidified by Bacon who describes a utopian society named "Bensalem", located off the West Coast of America.

In the 19th century, Ignatius Donnelly's *Atlantis: The Antediluvian World* (1882) included mappings of the topography of the Atlantic Ocean floor to propose that a giant land mass, bordered to the east by what is now the Azores, existed in the North Atlantic. Donnelly argued that a land bridge had connected Atlantis to the East Coast of South America, and that the Aztecs and other pre-Columbian civilizations in the New World were the descendents of Atlantan colonists.

Location Hypotheses

For hundreds of years, many searched for the sunken city on the ocean floor but none found any evidence. Critics of the Atlantis story believe that it is simply a myth invented to put across the great philosopher's views on war and corruption.

Believers in Atlantis, however, kept searching, pointing out that Troy was too once believed to be a figment of Homer's imagination, until 19th-century archaeologist Heinrich Schliemann proved otherwise.

The location of Atlantis in the Atlantic Ocean has a certain appeal given the closely-related names. Popular culture often places Atlantis there, perpetuating the original Platonic setting. However, most of the historically proposed locations are in or near the Mediterranean Sea.

The catastrophic Thera volcanic eruption, dated to the 17th or 16th century BCE, led to a large tsunami that some experts hypothesize devastated the Minoan civilization on the nearby Island of Crete, further leading some to believe that this may have been the catastrophe that inspired the story.

Recent Attempts

In 2011, a team working on a documentary for the National Geographic Channel led by Professor Richard Freund from the University of Hartford claimed to have found evidence of Atlantis in South-Western Andalusia.

The team used satellite photography, ground-penetrating radar, and underwater technology to look for proof of the fabled lost city of Atlantis. Freund's team suggested that the city was located in the swampy region of Dona Ana Park, which in ancient times was a bay.

They reached this conclusion by finding regular circular patterns under the surface not normally found in nature. They also found over a hundred memorial sites near the area that seem to be memorials honoring the destroyed city.

Moreover, Plato spoke of a rectangular temple on the center island dedicated to Poseidon; the team found an irregular rectangular shape in the center of the rings, the dimensions of which match with those mentioned by Plato.

Professor Freund and his team speculated that Atlantis had been destroyed by a tsunami, extrapolating results from a previous study by Spanish researchers, published four years earlier. However, the Spanish team who has been working on the site since 2005 dismissed the documentary claims as having no reliable basis in scientific fact and of misinterpreting partial results.

To this very day, the mystery of Atlantis remains unfolded. However, the passion of humanity for knowledge never seizes; with the restless pace of scientific advancement, the answer to this long-debated civilization is sure to surface someday.

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The Life and Death of Language

By: Jailane Salem

Language is the medium through which we express and communicate our thoughts to others. Some people say you are not born into a culture but into a language, which is understandable since language is the guardian of culture.

Different languages allow people to express certain thoughts and feelings that could be absent in others. Not all words have equivalents in other languages, which shows how language can be very culture specific, and can speak of a particular experience that only a certain number of people went through.

History has shown us that the languages of powerful groups spread across different lands, while the language of groups who are not as dominant has extinct over the centuries. This can happen through different processes: people may decide to use the language of the powerful in an attempt to gain more prestige when they do, or it could be that there is an official policy that requires citizens to speak a certain language, regardless of their cultural affiliations.

For example, in bilingual areas, a native tongue is usually abandoned for the politically or economically dominant language. This occurs because people view the dominant language as an agent to social betterment. What happens next is that parents start to neglect to actively pass on their linguistic heritage to their children, allowing the dominant language to quickly become the mother tongue of the next generations. As a result, the native languages die out, since it has no speakers.

A language's survival is dependent on people's attitudes towards it. Linguists say that around 8000 BCE there were more than 20,000 languages; in 2012, that number has become 6,909. Linguists also predict that in ten years' time half of the existing languages will vanish; but, how is it that languages are disappearing left, right, and center?

Some people believe that the cause of the death of languages nowadays is globalization. In search of finding a common language that can be used for commercialism, native tongues are being abandoned. For example, when a woman from Kenya and a woman from the Netherlands do business they will most probably conduct their transaction in English, since it is the dominant language on a global level.

However, globalization is not the absolute cause of languages dying; when each woman returns to her respective country, they will revert to talking in their native tongues. So we can see that globalization strengthens the position of dominant languages, but does not necessarily cause people to abandon their native tongues. It might be said that it gives people a stronger reason to become bilingual.

Another reason could be the process of interaction between nations and the integration that occurs due to migratory patterns. It is said to have a negative effect on the diversity of languages that exist.

When a family immigrates, the parents will speak both the mother tongue and the language of the country they immigrated to. If they neglect to pass on their mother tongue to their children, then they will grow up only speaking the language of the country they now call home, spelling the death of the native language in that particular family. However, since people still live back in the mother country, they will continue to preserve the language.

One of the recent language deaths that made the news was in 2010. Bo—the language of an indigenous tribe from India's Andaman Islands that is thought to have existed for 65,000 years—has died with the passing away of its last member, Boa Senior.

Even though the Bo language has been closely studied by researchers of linguistic history, Boa Senior spent the last few years of her life unable to converse with anyone in her mother tongue.

The Bo tribe is one among ten distinct Great Andamanese tribes that numbered around 5,000 people during the time of the British colonization of the Islands. These Islands are part of the Indian Territory, but are far off in the Ocean; before colonization they were more or less isolated.

It is believed that the indigenous tribes of the Islands can be traced to the migrations that occurred out of Africa thousands and thousands of years ago, and the languages spoken are believed to have originated from Africa as well.

When the British colonized these Islands in 1858, many of the Andamanese people passed away because they were exposed to diseases that their immune system could not deal with. This unfortunate occurrence decreased their number from 5,000 to 52, those who are thought to have survived until now.

From the numerous languages that existed, only speakers of the Jeru and

Sare ancient languages remain, and they have not been transferred to younger generations, meaning that they too will die out.

Not all existing languages have a written form; most of the languages that are in danger of extinction are those that have a rich oral culture, where histories, songs, as well as stories are passed from the older generation to the younger one orally. If these languages disappear, so will the oral knowledge preserved within them as they do not have a written form that facilitates documentation.

For example, although Latin is no longer used, it is a dead language not an extinct one because it is preserved in written form. When a language goes extinct, an entire culture disappears with it; what we as humans amass of knowledge is encoded in the language we use.

Indigenous groups who lived in close proximity with nature and observed the ecosystems closely, gained many insights that are preserved in their languages. Unfortunately, once these groups of people die out leaving behind no written record, the knowledge they gathered dies with them as well.

This was the fate of many indigenous groups; therefore, the study of indigenous languages has many benefits, since one will gain a greater understanding of the local environment, which can help in conservation efforts.

So, what is being done to combat the phenomenon of dying languages? Well, National Geographic started a project called "Enduring Voices", which it conducts in collaboration with the Living Tongues Institute for Endangered Languages. It strives to preserve endangered languages by identifying language hotspots—the places on our planet with the most unique, poorly understood, or threatened indigenous languages—and documenting those languages and the cultures within them.

As we have seen, languages can be dominant or dying. An alternative way to classify them is to define the stage at which a language is: "safe", "endangered", or "moribund". This method was devised by linguist Michael E. Krauss.

If a language is "safe", children will probably be speaking it in a hundred years. However, if the language is "endangered", then children will probably not be speaking it in a hundred years; approximately 60–80% of languages fall into this category. Finally, if a language is "moribund", then children are not speaking it now.

So far, we know how languages die, but are there any languages being born? Well, yes! To better understand born languages, you should be familiar with the "pidgins" and "creoles".

Pidgins are languages that form when two people speaking two different languages come into contact with each other. They form a hybrid language using their own language to communicate, and this is not the mother tongue of anyone. Once children acquire a pidgin as their mother tongue, it becomes a Creole.

Other born languages are neither pidgins nor creoles, but entirely new ones. Light Warlpiri has recently been born; it is a language created by children living in a remote village in Northern Australia. It is a mixed language using Warlpiri, Kriol, and Standard Australian English as its source languages.

It is spoken in the Lajamanu community, mostly by people under the age of 35. As of 2013, there were 350 native speakers of Light Warlpiri; it was first documented by linguist Carmel O'Shannessy of the University of Michigan. O'Shannessy has been studying the young people's speech for more than a decade, and has come to the conclusion that they speak a new language with unique grammatical rules.

What is interesting is that "Many of the first speakers of this language are still alive. One reason Dr. O'Shannessy's research is so significant, is that she has been able to record and document a "new" language in the very early period of its existence," said Mary Laughren, University of Queensland in Australia.

O'Shannessy explains that the development of the language was a two-step process, when parents started using babytalk with their children in a combination of the three languages—Kriol, English, Strong Warlpiri. What happened next was that the children considered that language as their native tongue by adding radical innovations and changes to the syntax.

This language is different to others, to the extent that sometimes the elders do not understand what the youngsters say. Dr. O'Shannessy believes that a new language developed not out of necessity, but because it became an identity marker to the children. It made them who they are and showed that they were young Warlpiri from the Lajamanu Community.

Human beings cannot function without a language, since communication is one of the fundamentals in our lives. The study of how languages develop offers us great insights into what it means to be human, and by working to preserve dying languages we can ensure that the knowledge encompassed within them is not lost, and that future generations can still benefit from the knowledge of their ancestors.

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It is a Manmade Disease

By: Lamia Ghoneim

Each year globally, 12.7 million people learn that they have cancer, and 7.6 million people die from the disease, including millions of children and youth in their prime. We, humans, are the ones responsible for their death because cancer is Manmade!

Yes, cancer, mankind's deadliest and most elusive enemy, was ironically created by humans, as declared by a recent study in Manchester University. "Cancer is an entirely manmade disease, fuelled by the excesses of modern life", the study of ancient remains concluded.

To trace cancer's roots, the researchers tested hundreds of Egyptian mummified bodies, analyzed possible references to the disease in classical literature, and scrutinized signs in fossil records, from a period stretching thousands of years, and found the evidence of cancer presence in only one case. Compared to one in three people today who will suffer from cancer in their lifetime, cancer is definitely a new phenomenon.

Michael Zimmerman, Visiting Professor at Manchester University, who worked on the study stated: "In an ancient society lacking surgical intervention, evidence of cancer should remain in all cases. The virtual absence of malignancies in mummies must be interpreted as indicating their rarity in Antiquity, indicating that cancer-causing factors are limited to societies affected by modern industrialization".

Zimmerman and his colleague Rosalie David were the first to diagnose cancer in an Egyptian mummy by rehydrating and analyzing slivers of its tissues on a microscopic level, identifying rectal cancer in an unnamed mummy who had lived during the Ptolemaic period, 1600 to 1800 years ago. However, that was the only case found with any trace of cancer in hundreds of mummies tested.

Dismissing the argument that cancers might have been comparatively rare in Antiquity because the short life span of ancient Egyptians back then precluded the development of the disease, the researchers pointed out that other age-related disease, such as hardening of the arteries and brittle bones did occur.

David and Zimmerman also analyzed ancient Egyptian literature for hints of cancer, and found that any evidence of cancer in their texts was also "tenuous" with cancer-like problems more likely to have been caused by leprosy or varicose veins.

They also examined medical studies of human and animal remains going back to the age of dinosaurs. They suggested that evidence of cancer in animal fossils, non-human primates and early humans was scarce, with a few dozen mostly disputed examples in animal fossil, as the journal Nature Reviews Cancer reports.

Even the study of thousands of Neanderthal bones has provided only one example of a possible cancer. Moreover, text from ancient Greece showed that they were probably the first to define cancer as a specific disease, and to distinguish between benign and malignant tumors. Manchester professors stated it was unclear if this signaled a real rise in the disease, or just greater medical knowledge.

As they analyzed ancient literature, they did not find descriptions of operations for breast and other cancers until the 17th century, and the first reports in the scientific literature of distinctive tumors have only occurred in the past 200 years, such as scrotal cancer in chimney sweepers in 1775, nasal cancer in snuff users in 1761, and Hodgkin's disease in 1832.

Professor David, who presented the findings to cancer fighting organizations, said: "In industrialized societies, cancer is second only to cardiovascular disease as a cause of death. In ancient times, it was extremely rare". He also added, "There is nothing in the natural environment that can cause cancer. So it has to be a man-made disease, down to pollution and changes to our diet and lifestyle."

Despite the thoroughness and bold statements released by researchers who conducted this study, not all scientists are convinced. They argue that simply there is not enough evidence presented in the study to provide reliable calculations about cancer rates in ancient populations.

They also argue that hundreds or thousands of years ago, life expectancy was short. Many people passed away in middle age from infectious diseases, and mortality in childbirth or childhood was also common. Factoring in that cancer is mainly a disease of the elderly—three-quarters of cases diagnosed in people aged sixty and over, and more than one-third (36%) of cases in people aged seventy-five and over—it is not surprising that cancer was a rare event in populations where people were unlikely to make it past forty.

Another concern the skeptics have with examining fossil record is that skeletal remains might not preserve cancers very well. "To see cancers with the skeletal record, you really have to have a tumor that is affecting bone," paleoanthropologist John Hawks, University of Wisconsin, Madison, said. "Although there might be few confirmed diagnoses of tumors in bones, it is because cancer is a difficult diagnosis to make from bone."

However, even the skeptics agree that it is almost certain that the propensity of

modern society to contract the disease has something to do with lifestyle, and the environment in which we live.

Smoking cigarettes, using asbestos as a building material, and the inclusion of carcinogenic material in photocopier toner, are examples of ways that we have increased the risk of contracting cancer. Damaging the ozone layer has led to a rise in the incidence of skin cancer, and polluting water supplies with carcinogenic chemicals increases the incidence of cancers.

So, while the scientists still argue about the intent behind the creation of the circumstances that lead to cancer, we can be sure that the human civilization has made a significant contribution to the disease.

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The Taste of Culture

By: Aisha Hassanein

In some cultures, the healthiest of them all, as in Japan, the cuisine is very healthy; they live primarily on fruits, vegetables, and fish. As their lifestyle is very active and their diet is very healthy, Okinawa has some of the longest living people in the world, and most definitely some of the healthiest.

What is more interesting is the social dynamics and culture of Okinawa when it comes to food. It is actually socially unacceptable to overeat on a dinner table in Okinawa. As their work and livelihood depends on every member of the society being fit and active, it is deemed socially unacceptable to gain weight. In other words, this is a culture where what they eat is very healthy and their social behavior is conducive to a healthy lifestyle.

In other cultures, it is a bit of a mystery how people are mostly healthy. The case of French women, for instance, has been an interest of many researchers, simply due to the fact that the French cuisine is not healthy at all. Though infamous for their love of butter, French women seem to be generally quite thin, which has led to lots of questions.

Here, we realize that culture and social behavior play a very big role. The French are raised to enjoy food, enjoy the taste, the texture, the complexity of their cuisine, but more importantly in this case, they are taught to stop eating as soon as they start feeling full. American diners always complain about the portion sizes at French restaurants, but it is solely due to the fact that the French are intrinsically unable to overeat.

That is why they will want to enjoy a mouthwatering appetizer, a sophisticated main dish, and a delicious dessert; all full of butter. Nevertheless, they will not want to get full before their meal ends; hence, the small portions. The French have demonstrated how a culture can have an unhealthy cuisine but social habits that will make its people primarily in good shape.

On the other end of the spectrum, we find cultures like ours, the Egyptian, where the cuisine is not healthy and neither is the culture of eating. We have all been invited by generous and loving family and friends, who insist on feeding us far more than any person's stomach needs or can tolerate; most probably, we have all been guilty of it ourselves at some point.

It is, after all, a big part of our generous and hospitable culture and identity. Unfortunately, this has produced generations upon generations of unhealthy people, low life expectancy rates, and a high prevalence of obesity and obesity-related diseases. Hope is not lost; here are some ways to respectfully eat less the next time you are invited for a big feast:

1. Always keep half of your plate full of salad. This way the host will not have a lot of space to fill your plate with other food.
2. Eat very slowly. The host will want to see that you have food on your plate and that you are eating at any given time.
3. When you are done, leave the table. They cannot feed you in the washroom.
4. Be genuine and complement them a lot on how delicious the food is. Make sure to mention every item on the table to demonstrate that you have tried them all.

Our culture is one to cherish. We are generous and loving people, and it is important that we appreciate that and respect it. It is also important, for our health, that we are able to take the best of it and respectfully stay away from the worst. As the French have taught us, we can enjoy our delicious food and still stay healthy.

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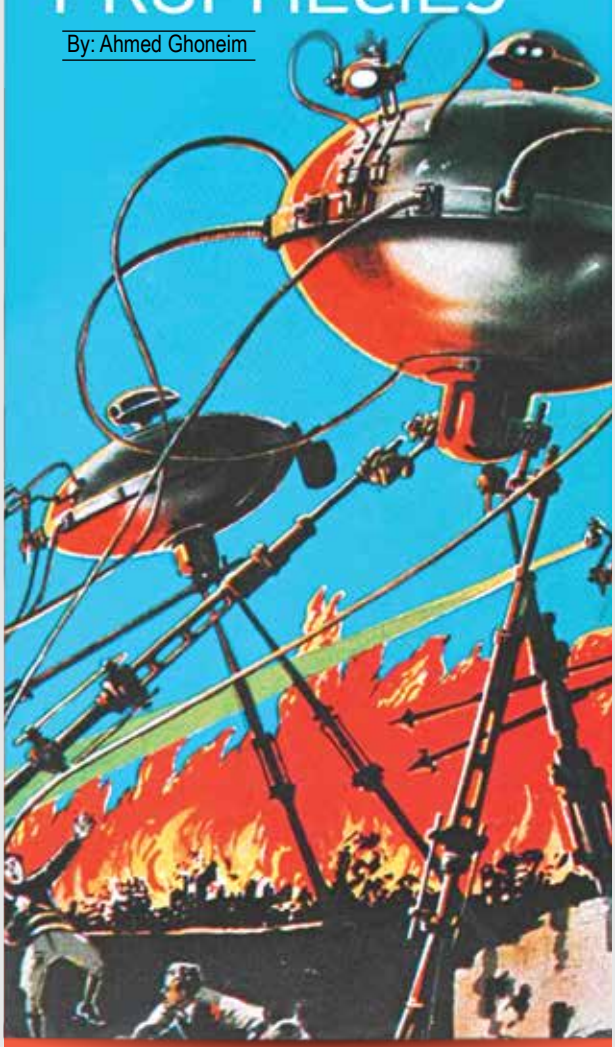
There is no doubt that food is an important part of any culture; in many ways, people express their heritage through food. However, it goes beyond the different food types and cuisines of each country or region; rather food plays a big role in social dynamics and cultural practices of different people.

You could say that what people eat and how they eat it is greatly influenced by their culture; in other words, the way they have been brought up. In that respect, a culture or social behavior has a great impact on a person's lifestyle and health.

SCIENTIFIC PROPHECIES

By: Ahmed Ghoneim



Historians have long relied on scriptures full of poems and epic stories to find more about a certain era. You see, even though lots of writings are fictitious, they still do reflect the culture in which they were written. If you want to know how Russia seemed like in the 19th century, you can read *Anna Karenina*, and if you want to know more about the American Civil War without reading long history books, you can pick up a copy of *Gone with the Wind*.

Since the recent age is all about science and scientific discovery, you will find that many of the science fiction you read is not all fiction. Writers tend to research what they write very well and even though they might go wild with their imagination, there are a few writings—either movie scripts or literary books—here and there that have, sometimes so accurately, described things that became true in the future.

Father of Science Fiction

Jules Verne is a French novelist who lived in the 19th century. He is well-known for his science-fiction writings that have given him the title "Father of Science Fiction". Among his most famous novels are *Journey to The Center of the Earth*, *Twenty Thousand Leagues Under the Sea,* and *Around the World in Eighty Days*; all these novels are an adaptation of something that you must have seen or heard of.

In his 1865 novel, *From the Earth to the Moon*, Verne not only describes a scenario very similar to the Moon landing in 1969, but also bases it on plausible calculations. He was a writer not only with a wild imagination, but he was also influenced by the day's science and published papers.

In the novel, he imagines three men riding a capsule that is shot into space using a cannon. He proposed that by applying enough force, the capsule could escape gravity and be able to reach the Moon. He also fantastically described weightlessness outside Earth as experienced by the three protagonists even though there was no way to confirm this idea at that time.

In his novel *Twenty Thousand Leagues Under the Sea*, he proposed an electric submarine, in a time when electricity was not common or understood enough to be ever envisioned as something that could drive a submarine. He also described a gun that would deliver a strong electric jolt much like today's Taser gun.

In an article in 1889 entitled "In the Year 2889", Verne made many predications about the world a thousand years ahead, some of which came true. He imagined that people, instead of reading newspapers, would subscribe to something that would allow them to listen to the news from reporters and world leaders. It was not until about thirty years after his article that the first radio newscast happened, and another forty years until the first television newscast.

Writer or Prophet?

Another writer who had pictured the future in his writings was English writer Herbert George Wells who studied biology. The first novel he wrote in 1895 imagined a time machine with which the traveler can go anywhere in time and space. This is until now considered theoretically impossible; his first real prediction, however, came in 1898.

You have probably seen the movie "War of the Worlds" starring Tom Cruise. It is about an alien invasion in which aliens who have installed devices called tripods on Earth ages ago decide to activate them and begin an invasion. The novel was published in 1898, yet the movie came out in 2005, and still felt relevant to our age.

That is how deep into the future Wells looked. In the novel, the alien tripods that attacked humans could emit "heat rays" so strong that they could melt and burn things. Their description was similar to what we know as laser nowadays.

What is considered Wells' most impressive prophecy, however, is nuclear bombs. By the time his novel *The World Set Free* was published in 1914, radioactivity was well-known. It was known that radioactive elements decayed for thousands of years and that their rate of emission is low. However, the total amount of radiation emitted over the years is massive, and that was the basis of Wells' theory.

He theorized that by harnessing the internal energy of the atoms, a great reaction can be achieved that can go on destroying for days. He also imagined that the aftermath of such attacks would be health problems for the residents of

the places where these bombs were detonated. Added to that, Wells proposed that the only solution to such an explosive threat was to achieve a global community that worked towards nuclear non-proliferation.

The Third Father of Science Fiction

Hugo Gernsback was a Luxembourgian science fiction writer who shares the frequent title of "Father of Science Fiction" with H.G. Wells and Jules Verne. His influence is so wide such that the annual World Science Fiction Convention awards are named after him "The Hugo Awards". In his life in the 20th century, Hugo created a science fiction magazine *Amazing Stories*. In addition to the magazine, he made some predictions of his own.

In his novel *Ralph 124C 41+* published in 1911, he designed a radar. Complete with a diagram that looks very much like our modern day radar, he theorized that waves sent to metallic objects would reflect much like light, and could be used to detect the existence of other ships, just like a mirror. It was not until 1934 when the first radar was invented.

In the same novel, Hugo also described a device he called a Telephot, which was a wall-mounted screen with buttons that allowed a person to video call friends! He had envisioned Skype.

Hugo's predictions were not just limited to his novels. In the 1927 issue of *Science and Invention magazine*, he wrote an article imagining how the year 1947 would be like entitled "Twenty Years Hence". In this article, he predicted that television would become a mass broadcast medium through which you can watch a baseball match. He predicted that humans will be able to cool their homes much like they do with central heating.

In Film and Television too!

With the advent of film and television, science fiction was no longer confined to literary works. Screenwriters would pour their imaginations into numerous movies and TV shows that also had their fair share of predictions.

Star Trek

Star Trek is a popular franchise of many TV series and movies over the ages. Debuted in 1966, it chronicles the story of a starship in 2260; the starship's crew used teleportation devices, and many fantastical technologies that do not exist today, and may not exist in the future. Some of the things imagined by the franchise's writers, however, were remarkable.

To communicate with each other, the characters used a device they named—non-imaginatively—the communicator. The device looked much like a modern flip-phone, which is strange because even the first mobile phones invented looked nothing like it.

Not only did they imagine a device in the future, they imagined a modern form of it. The device even had "bars" to indicate the strength of the signal. What is more fascinating is that some of the characters wore earpieces in their ears that look much like today's Bluetooth headsets. One of the devices the characters used in controlling the starship even looks like a modern-day tablet.

2001: A Space Odyssey

Of the many science fiction productions of the 20th century, "2001" is considered by critics and fans alike to be one of the—if not the—greatest. Produced in 1968, as both a novel and a movie, *A Space Odyssey* pioneered in special effects and scientific accuracy. It imagined the future of humanity in 2001.

Although too optimistic about the technological advancement of the human race in the future, some of the things it mentioned have occurred or are plausible enough to happen somewhere along the way.

The development of "2001" was very well-researched. Most of the predictions it made were based on the opinions of real-life scientists of the 1960s. Marvin Minsky of the MIT AI Lab was an advisor on the film set, and he helped develop the Heuristically programmed ALgorithmic (HAL) computer.

HAL was an antagonist of the film who could win at any game of chess if he wishes to, which is now a reality. He had speech recognition abilities, what is known as natural language processing, could read lips and recognize faces. He also had humanoid artificial personality that allowed him to interpret emotions and appreciate art. All these capabilities—except for art appreciation, of course—are now present in modern day computers with differing levels of realism and accuracy.

Minority Report

Much like 2001, Minority Report—which came out in 2002, starring Tom Cruise—was produced with research. The movie's director, Steven Spielberg, invited fifteen experts for three days to come up with ideas that he could incorporate into the movie that is supposed to be happening in 2054. They came up with a few futuristic ideas, some of which have become a reality today, and others that might become a reality in the future.

In the film, there were devices that scan your eye to identify who you are by your retina, much like fingerprinting. These devices exist today, and they are used for security around the world. Furthermore, the characters used multi-touch screens and transparent screens, both a reality today. In the Apple iPhone's premiere, it was said that using the iPhone will feel like Minority Report.

One of the more negative aspects of the future depicted in the film that too quickly became a reality is personalized advertising. In the movie, each billboard would show a different ad to each customer depending on their interests. Apart from a few experimental billboards existing today, Google and Facebook make most of their revenue by personalizing ads depending on usage statistics.

As you can see, fiction just shows what the society is thinking at a certain moment in time. It can be that science fiction recorded what scientists were already predicting based on facts in front of them, or was imaginative enough that it struck gold at times. It could also be true that in moments some inventors were inspired by a movie they saw, or a book they read, and decided to make an imaginary idea a reality. Regardless of which is true, science fiction cannot be taken for granted!

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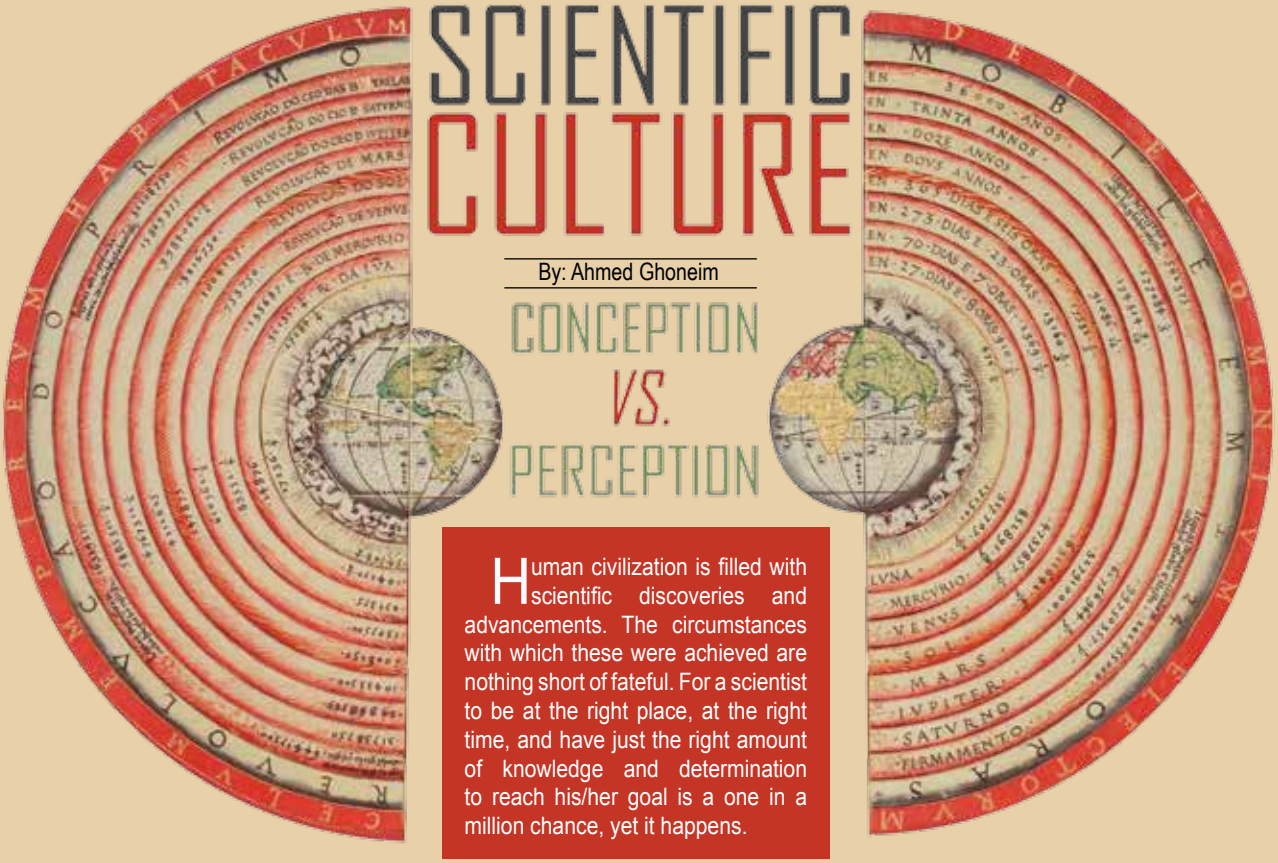


SCIENTIFIC CULTURE

By: Ahmed Ghoneim

CONCEPTION VS. PERCEPTION

Human civilization is filled with scientific discoveries and advancements. The circumstances with which these were achieved are nothing short of fateful. For a scientist to be at the right place, at the right time, and have just the right amount of knowledge and determination to reach his/her goal is a one in a million chance, yet it happens.

One of the most mitigating factors in scientific discovery is the culture in which the scientist lived. Imagine if Charles Darwin had put forth his theories in the Middle Ages, or if Einstein did not move to the United States and was caught by Nazis. What would have happened then? Let us explore some of the many stories in which the culture the scientist lived in influenced what they did, or its aftermath.

The Center of the Universe

Among the scientists who were influenced by the surrounding culture was Galileo, an Italian genius who lived in the 16th century. Among his many inventions were a thermoscope—predecessor to the thermometer—which is a redesign of the military compass, the first device to be called a microscope, and his own version of the telescope.

Back in the 16th century, most scholars and scientists believed in geocentrism; the idea that the Earth is the center of everything. This was common belief until Nicolaus Copernicus came along, and supported heliocentrism.

In a book published in the year of his passing away, 1543, Copernicus stated that the Sun is the unmoving center of the whole universe and that everything else, including the Earth, revolved around it. He also proposed that the Earth completes a revolution around the Sun once a year, and that it revolves around itself once a day.

Having no proof to his theory, along with the rejection of his claims by all the other scholars at that time, this theory was not paid much attention.

When Galileo came along a few years later, though, he had some observations that showed Copernicus assumptions may be right. First of all, his sighting of four moons revolving around Jupiter proved that not everything revolves around Earth, as was believed.

Secondly, he discovered the phases of Venus, which are changes in lighting similar to the Moon's stages, which indicated Venus might be orbiting the Sun. He also noticed that sunspots happened to change location, as if the Sun was revolving around its own axis.

When Galileo presented his views, he was not very tactful about it. Fiercely defending his theory and using a sarcastic style in criticizing his opponents, he made many enemies; his biggest enemy was the Pope. As there are many verses in the Bible that imply the Earth is the center of the universe, being the place God decided to put humans on, heliocentrism was considered opposing to God's word.

Galileo was thus tried in 1633 for heresy and convicted; he spent the rest of his life under house arrest. In this period of nine years, he wrote one of his best publications, *Two New Sciences*, about kinematics and strength of materials.

The Origin of Species

In contrast to Galileo's experience, Charles Darwin had it easy. When he published his book *On the Origin of Species* in 1859, it was a much more modern world.

For one thing, Darwin's theories, which stated that all living organisms today had evolved from less developed creatures through natural selection, were not put forth in a completely anti-church manner. Darwin deliberately avoided attempting to trace the origins of humans in his first book, instead focusing on animals and plants. He only said that "Light will be thrown on the origin of Man and his history".

In fact, the objections showed by religious scientists to his book were against evolution itself, because they believed God had created a finite, unchanging number of species and that evolution is too autonomous to be influenced by God. This view was not strong enough to refute his claims on religious basis.

Moreover, Darwin had created a book that was so well-crafted and backed with lots of evidence, diagrams, and simple arguments that he was very convincing. Add to that the fact that he was already a well-respected scientist before he published the book, and you will find that Darwin did not face much persecution, but rather a lot of criticism.

In the years following the release of his book, debate sprang between the thinkers of the age on the origin of Man, even though Darwin was silent about the matter. By the time he had published his book *The Descent of Man*, in which he did link humans to apes; it was already a topic that did not shock anyone.

Opposition to Darwin's theories is arguably stronger today than it was in his age. Nowadays, people known as "creationists" oppose evolution and its teaching in schools. The most prominent country with such issues, ironically, is the United States.

In several States throughout the 20th century, the teaching of evolution was banned in public schools. Even though it is not banned today, teaching evolution is causing much controversy in the USA. In Egypt, on the other hand, evolution is taught in schools and has not caused much controversy.

The Radioactivity of Elements

Marie and Pierre Curie were a brilliant couple who lived in the 19th and 20th centuries. Born in Poland, Marie met Pierre in France where she had obtained her degree in Physics from the University of Paris and was carrying out research.

Pierre offered her space in his laboratory and proposed marriage to her; she declined because she wanted to be a professor in Poland and traveled back there. Ironically, the University of Krakow declined to offer her a position because she was female; thus, she returned to Paris and married Pierre.

Working from a converted shed and with Pierre's support, Marie spent years—in the middle of which Pierre was so intrigued by her research that he left his and joined her—sifting through samples of Uranium ores. Marie noticed that the same mass of pure Uranium was less radioactive than its ores, which made her believe that there had to be another element causing the extra radiation. She discovered that element and named it Polonium, in honor of her country.

Marie was the first person to hypothesize that radiation was produced from within the atom, giving rise to the idea that the atom can disintegrate or split. She and Pierre discovered yet another radioactive element and named it Radium. In one of the 32 papers they published on radioactivity, they noted that cancer cells were destroyed faster when exposed to Radium.

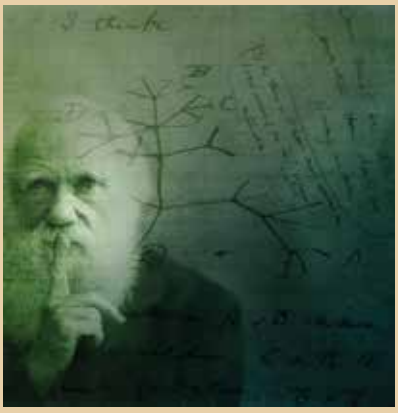
This work culminated in them winning the Nobel Prize in Physics jointly with Henri Becquerel in 1903. Marie Curie became the first female to be awarded the Nobel Prize. Ironically, she was going to be overseen if it was not for one of the Nobel board members who believed in female scientists and recommended "adding" her to the prize.

The Stem Cell

Stem cells are the mother of cells; they are cells that have not yet specialized. Found in embryos in the first few days of development, there are also kinds of adult stem cells that exist in our grown bodies.

One type of these stem cells exists in the bone marrow and is known as Hematopoietic stem cells; they generate all blood in our body. When a patient with leukemia—blood cancer—undergoes chemotherapy, the therapy does not differentiate between cancer and stem cells, killing both. In severe cases, a bone marrow transplant is needed; the patient is given stem cells from another compatible donor, which replenishes the stem cells in the bone marrow.

Bone marrow transplants have been around for more than thirty years now. The more miraculous stem cell treatments, however, are still being developed today. It is because stem cells can turn into any other types of cells they can be theoretically used to fabricate complete organs, for example.



Researchers have been able to reach highly promising results with mammals, and others with human cases. In 2003, researchers in Korea were able to make a woman walk again after 19 years of not being able to stand up by injecting stem cells into her injured spinal cord, which then turned into spinal cells and healed her.

Stem cell research does not come without its share of huge controversy, though. Adult stem cells are limited in the kind of cells they can specialize into. The aforementioned Hematopoietic stem cells, for example, can only specialize into blood cells. Embryonic stem cells, on the other hand, are the beginning of a new life. They specialize into all kinds of cells and are the most useful and promising of stem cells.

If stem cell therapy becomes successful, it can be used to treat numerous diseases from cancer to Alzheimer's. The problem with researching embryonic stem cells is that you have to create an embryo by artificially fertilizing a human ovum. After extracting the stem cells, the embryo is killed; this has been deemed unethical by a handful of people, unreligious as well.

The fact that scientists would create human life—even though it can be argued that an embryo is still not, by far, a human life—and then terminate it at will sounds like playing God. Many countries thus ban embryonic stem cell research.

The Big Picture

Throughout history, scientists have led tragic lives. Science with its many wonderful possibilities was sometimes so close yet not achieved, as in stem cell therapy, or created storms of controversy when achieved, as with heliocentrism.

All in all, do you think that Galileo's experience was bad, or does the fact that his nine years of house arrest resulted in a great work make it all okay? Do you think Darwin is a poor lost soul who needed to believe more strongly in God? Was he right? Or can there be middle ground between creationism and evolution?

Do you think that stem cell research, which could be mankind's salvation, should be hindered by the beliefs of religious people when an embryo is just a few cells that have not even formed a human yet, or should all life be respected regardless of its size? These are questions for the ages.

The Arab Renaissance

By: Dr. Mohamed Soliman
Director, Manuscript Museum

Muslim Arab scientists played a significant role and had great influence on human civilization through their numerous contributions during the Middle Ages. These contributions varied from discoveries, inventions, and theories in the fields of medicine, chemistry, pharmacy, physics, geometry, algebra, mechanics, mathematics, astronomy, to the humanities, including poetry, literature, and social sciences. We can thus say, they contributed to human knowledge as a whole, which is the main reason behind the development we are witnessing at the present time.

While ignorance prevailed Europe, the Middle Ages from the 8th century to the 15th century represented the Golden Age for Arab scientists and its civilization. For example, in mathematics, which is the foundation upon which human civilization in the modern era was built, Karl Popper—one of the greatest philosophers of science—stated in his book *The History of Mathematics* in 1994 "Without the Arabs' discovery of the Arabic numeral system, mathematics would have still been in its early stages. Instead, through this discovery, humans became able to invent and to know nature as a whole". Unfortunately, most Arabs and non-Arabs do not know that.

Arabs have contributed to the field of medicine where they published many books, such as *Al-Hāwī* by Abu Bakr Al-Razi in 864, *Al-Tasrīf* (The Method of Medicine) by Abu Al-Qasim Al-Zahrawi in 1035, and *The Canon of Medicine* by Avicenna in 1037. These books were taught in European universities until the 18th century and were the basis of modern medicine.

Muslim scholars have also excelled in pharmacology, and it is sufficient what was mentioned in the *Encyclopedia Britannica*, which reads: "The truth is that a lot of drugs and compounds known up until now—obviously except modern compounds—and the general structure of modern pharmaceutical industry were initiated by the Arabs".

As for astronomy, Arabs had many contributions that vary from the discovery of stars locations, movements, and the distances between them to the invention of machines and tools for observing them. Arab contributions were the cornerstone for establishing astronomy, naming stars and identifying their locations. This is evident when reviewing the names of stars and planets at the present, where we would discover that most of them have maintained their original Arabic names.

In this introductory article, it is not possible to mention all Arabs contributions to human civilization in general, and to science in specific. These words are only a brief glimpse of the influence of the Arab civilization. Even Greek and Roman sciences were translated by Arabs, and they had the biggest role in transferring them to the other nations by then.

In the next series of articles, we will be elaborating on specific contributions, discoveries, and inventions that have contributed to human civilization, where Arabs have been the pioneers and leaders, and the effects of which are reflected today.

I will conclude this article by George Sarton's statement: "Muslims are the geniuses of the East; they had great influence on humanity. They took over the documentation of valuable, original, and profound studies, using the Arabic language, which is without doubt the language of science for the human race... Muslims have achieved what can be called the miracle of Arab science".

Al-Hāwī by Abu Bakr al-Razi in 864 CE.

Art and SCIENCE: An Unfathomed Tie

By: Gamal Hosni, Director
Art Exhibitions & Collections Department

It is quite unusual, if not totally dismissible, for the common viewer of a work of art to associate the maker of the artwork he/she is gazing at with any branch of science. However, the close relation between the production of works of art and all strands of science and nature could be tighter than many of us could imagine.

Ever since the beginning of times in Ancient Egypt, artists have resolved to the study of the nature of stones, minerals, wood, becoming masters in manipulating materials of nature to attain the highest artistic levels that can be obtained out of each material.

Moreover, they observed natural phenomena, becoming accomplished astronomers, geometers and architects. Thus, they could position huge complexes of temples in alignment to celestial constellations and introduce orifices in buildings to allow the penetration of sunlight to light up the portrait of the king in the sanctum sanctorum of the temple to the amazing exactitude of a certain day of the year at a specific hour.

Even now, it is difficult to bring art and science in one sentence and not finding Leonardo da Vinci popping immediately in one's mind. Indeed, da Vinci, artist, engineer, and scientist had these disciplines and more melted in his persona as evidenced by his vast legacy of drawings and codices.

He built on the efforts of his predecessors who used the scientific laws of geometry and perspective in painting to claim painting as a science *per se*. He even went further on: "…*he believed that the painter, doubly endowed with subtle powers of perception and the complete ability to pictorialize them, was the person best qualified to achieve true knowledge, as he could closely observe and then carefully reproduce the world around him [..]. In formulating his own principle of graphic representations—which he called 'dimostrazione' ("demonstrations")—Leonardo's work was a precursor of modern scientific illustration." (Britannica)*[1]

Moving on to a more recent timeline, based on the scientific grounds of the Laws of Optics, the discovery photography was *"so important that artists from then onwards could never again paint as they had done before"*[2]

"The development of photography by the late 1800s further accelerated the speed of production. It was only a matter of time and technology before film, the next step in the progression toward more exact representation in man's communications, evolved to its maturity.

What are the effects and significance of these new art forms? [Walter] Benjamin understood and lauded the potential democratization of the communications media and the arts implicit in advances in mechanical reproduction. A work of art that once could only be seen by the wealthy in a museum or gallery could be reproduced at little cost and made accessible to many more people.

The advent of inexpensive illustrated newspapers meant that current events had become the business of the masses. Film allows an event or a performance to be recorded and be available for countless audiences to see. Mechanical reproduction makes possible the involvement of the masses in culture and politics; it makes possible mass culture and mass politics."[3]

This was just a hint about the tight connection between art and science. In future issues, we shall be tackling specific cases where we would explore this close connection even closer.

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Exploring the Human Civilization Enigma

EPISODE 1

By: Dr. Omar Fikry
Head, Planetarium Section
Planetarium Science Center

They descended from the sky shrouded from everyone. They came from a very far place. They came to you and asked you to join them, to be their guide during their journey on our Earth.

They were three; you have never seen any creature like them before. A mixture of smoke and jelly, they were green; one very short, the second very tall, and the third very fat.

They asked you about our planet although they know it; you tell them they are on Earth. You ask them "Who are you?" No one answers; they only stare at each other, making signs only they understand. It seems they are trying to understand your language and translate what you are saying to their language.

You ask yourself "Am I sleeping? Are they ghosts?" You rub your eyes and look again; they are still there staring at you.

Finally, one of them spoke, the shortest; he asked you in clear Arabic "How do you live on Earth?" It is a vague question; what does that creature mean by this question? And why is he asking you specifically?

Then, you ask yourself again "If they are asking such a question, then they are not ghosts and it appears they have a certain idea about life on Earth. But they must have seen something opposite to what they had thought; otherwise they would not have asked such a question".

Overwhelmed by the many thoughts inside your head, still dazed by the surprise of seeing such odd creatures in front of you suddenly, the tallest asks you yet another weird question "You have inhabited a paradise full of God's wealth; who ruined it like that?"

The picture starts to clear up and you wonder if these creatures know how Earth was like and how it has become. You start a conversation with them although you are not fully awake yet; you ask them "Could you please elaborate?"

The shortest answers "We came here to learn how you reached that level of development and civilization. They told us your planet, Earth, has reached a high level of civilization; however, when we landed here, we found the opposite. We found very clean places and others extremely dirty; we found decent people and others very barbaric; we found beauty in places and ugliness in others; we found sophistication in places and backwardness in others. We just need to know how you live like this on Earth?"

He keeps repeating the same question: "You have inhabited a paradise full of God's wealth; who ruined it like that?" So you ask them "What does civilization mean for you?"

The fattest answers for the first time in a manner that differs from that of his friends "Civilization is a social system that helps humans improve their cultural production. It consists of four elements: economical resources, political systems, creational traditions, science and art.

It begins when human anxiety ends, because once humans feel safe, their aspiration and the motivation to create and construct emerge. Natural stimulators do not stop pro… prov... provo... (the shortest helps him finish his speech) provoking (he continues talking in the same manner as if he is a robot reading from a book or from a voice file stored in his memory). Natural stimulators do not stop provoking them to continue their search to understand life and its prosperity and… and…

You burst with laughter; he stops talking and looks saddened by your sudden hysterical laughter. He looks at his colleagues who rotate around him twice while he stands still; you stop laughing and they stop rotating.

The fattest continues talking about human civilization with the same enthusiasm and the same manner: "Civilization depends on scientific research and art in the first place. The scientific part is represented in the technological innovations and sociology, while art is represented in architecture, sculpture, and some arts that contribute to development. Art and science are two complementary elements that drive any civilization."

You signal to him to stop talking; your fear and surprise gone, you start to catch up with him: "I still do not understand the meaning of civilization?" The fattest stops talking and the tallest starts to speak: "Civilization in Arabic is derived from the verb civilize. It is known that civilization is constructing villages, rural areas, and houses; it is the contrary to nomadism.

The term civilization is used to describe the complicated society where most of its population live in cities and practice agriculture, unlike nomadic communities with their tribal nature, moving all the time, and living on means that do not connect them to a certain geographical spot, such as hunting. The modern industrial society is considered a form of civilization."

You become fascinated, and bewildered, but you try not to show any emotion till you see where this adventure takes you. The tallest continues: "The word 'civilization' is a controversial term that is open to debate; when used it evokes values (negative or positive) such as success, humanity, grace. In fact, a lot of civilized people from different civilizations see themselves as…

He suddenly stops talking and they disappear; they have heard the room door opening. It seems they do not want anyone to see or talk to them but you, and only you…*To be continued.*

VISITORS INFO

Planetarium

Available Shows

Stars Show
45 min. Live Show by the PSC Resident Astronomer

Oasis in Space
25 min. Full-dome Show

Stars of the Pharaohs
35 min. Full-dome Show

Seven Wonders
30 min. Full-dome Show

The Life of Trees
33 min. Full-dome Show

Kaluoka'hina
35 min. Full-dome Show

Mystery of the Nile
45 min. IMAX Show

Cosmic Voyage
35 min. IMAX Show

Visitors INFO

- For the Planetarium daily schedule and fees, please consult the Center's official website: www.bibalex.org/psc
- Kindly note that, for technical reasons, the Planetarium maintains the right to cancel or change shows at any time without prior notification.

History of Science Museum

Visitors INFO

Opening Hours
Saturday to Thursday:
[10:00–15:00]

Guided Tours Schedule
Saturday to Thursday:
[10:30, 11:30, 12:30, 13:30, 14:30]

- Museum entry fees are included in all Planetarium shows tickets.
- For non-audience of the Planetarium, Museum entry fees are EGP 2.-
- Museum Tours are free for ticket holders.

ALEXploatorium

Visitors INFO

Discovery Zone

Opening Hours
Saturday, Sunday, Monday, Wednesday and Thursday: [9:30–15:30]
Tuesday: [9:30–12:30]

Guided Tours Schedule
Saturday, Sunday, Monday, Wednesday and Thursday:
[9:30, 12:30, 12:30, 14:30]
Tuesday: [9:30–11:00]

Entry Fees
Students: EGP 5.-
Non-students: EGP 10.-

Listen and Discover

- For the list of shows available at the "Listen and Discover" and the schedule, please consult the Center's official website: www.bibalex.org/psc.
- For reservation, please contact the PSC Administrator, at least one week before the desired date.

Show fees
DVD shows:
Students: EGP 2.-
Non-students: EGP 4.-
3D shows:
Students: EGP 5.-
Non-students: EGP 10.-
4D shows:
Students: EGP 10.-
Non-students: EGP 15.-

"The Republic has no need of scientists"[5]

In 1793, during the bloody Reign of Terror, Lavoisier was arrested, along with all other former tax gatherers. In 1794, he was branded a traitor by the Convention under Maximilien de Robespierre. He was formally brought to trial on 8 May of the same year, and according to a famous tale, all appeals for his life so that he could continue his experiments were cut short by the judge: "the Republic needs neither scientists nor chemists; the course of justice cannot be delayed".

Lavoisier was convicted with summary justice of: having plundered the people and the treasury of France, of having adulterated the nation's tobacco with water, and of having supplied the enemies of France with huge sums of money from the national treasury.

They neglected to mention how he had singlehandedly reinvented and revolutionized Chemistry, freed it from it alchemy roots, set the path for the Industrial Revolution, and changed the course of human civilization.

Following Lavoisier's death, French mathematician Joseph-Louis Lagrange lamented the beheading, stating: "It took them only an instant to cut off that head, and a hundred years may not produce another like it".

Quotations

1. The opening statement in *A Tale of Two Cities* by Charles Dickens.
2. Statement by Lavoisier when he was a young student at Mazarin.
3. Statement by Lavoisier, a declaration of the Law of Conservation of Mass.
4. French saying, describing the tax collecting wall around Paris. Quoted in D. McKie, *Antoine Lavoisier: Scientist, Economist, Social Reformer* (1952), 136
5. Alleged statement by the Judge who sentenced Lavoisier.

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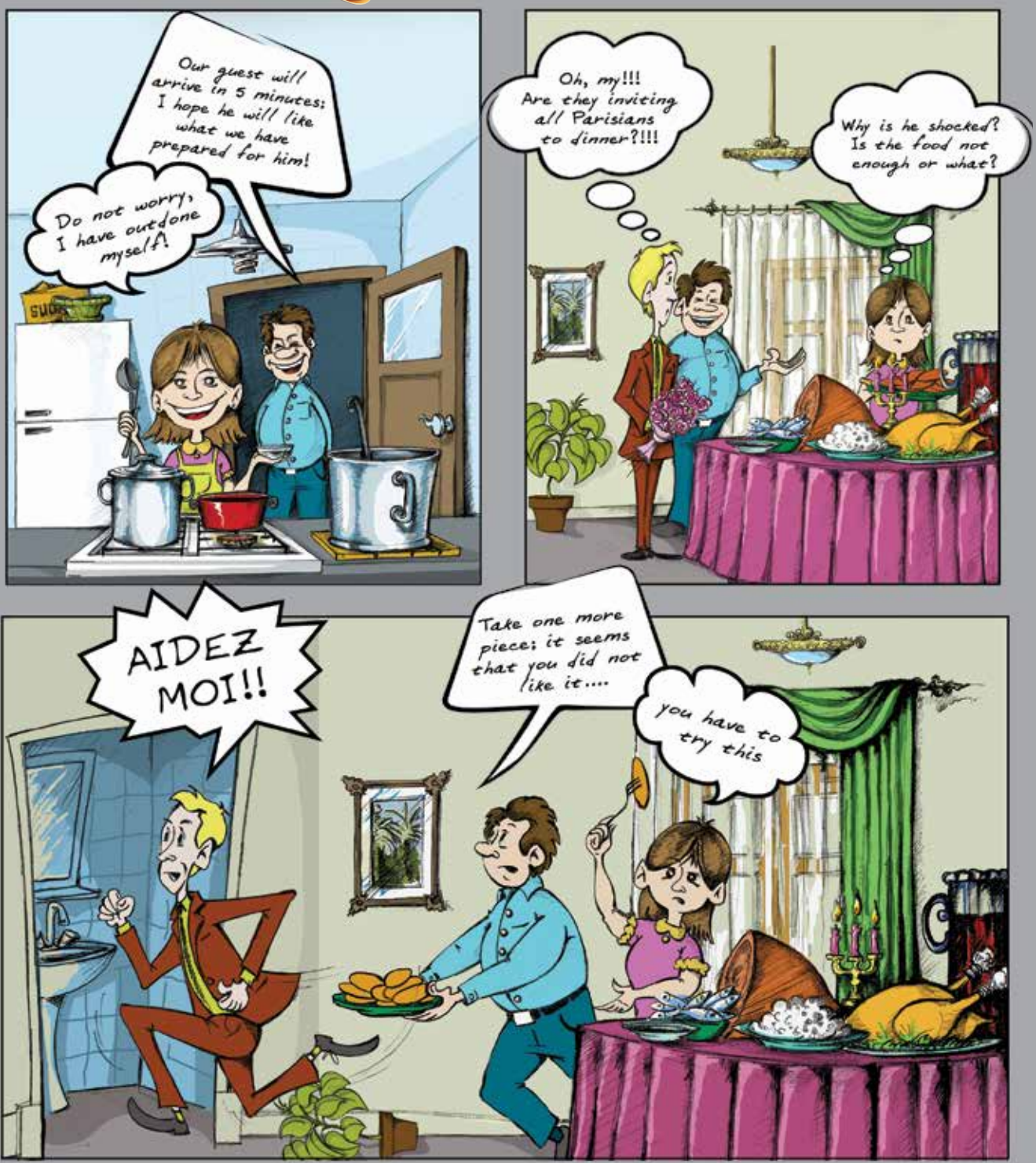
Generosity Killed the Guest



Illustrated by: Mohamed Khamis

If you want to know why the guest is rushing to the restroom, check page 15