ARBiT
it happens here...

International Day for Tolerance

There's no doubt that a world free of tolerance would not be a good place to be. It is the belief of those supporting this day that everyone has a right to their expression, religion, and their conscience without fear of bias or ridicule. This day was created to encourage mindfulness and faith in human rights - in order to encourage equality and diversity across the world, the UN introduced The International Day for Tolerance in 1996. It followed the United Nations Year for Tolerance, which was 1995, in order to observe its teachings annually.

#AGEING

Manipulate Stress Response

This is the first time a link between this stress response and ageing has been uncovered

Scientists at Nanyang Technological University, Singapore (NTU Singapore) have found that a stress response in cells, when 'switched on' at a post-reproductive age, could be the key to slow down ageing and promote longevity.

In lab experiments on a type of roundworm that shares similarities with humans, the NTU Singapore team found that switching on this stress response in aged worms by feeding them a high-glucose diet extended their lifespan as compared to worms fed a normal diet.

This is the first time a link between this stress response and ageing has been uncovered, said the NTU team of their findings published on 19 October.

While further studies are needed to gain a deeper understanding of this link, the scientists said their findings open the door to the development of therapies that could delay the onset or even tackle age-related disorders such as cancer, dementia, and stroke.

Cell biologist and study lead Associate Professor Guillaume Thibault from the NTU School of Biological Sciences said: "Ageing is a critical risk factor

for a variety of human pathologies, from metabolic diseases such as diabetes to cancer and neurodegenerative diseases. From a public health perspective, determining the cellular pathways that underpin the ageing process could take us one step closer to developing novel therapeutic strategies to treat age-related disorders.

"While our study found that a high-glucose diet could be useful to slow down ageing and promote longevity in aged worms, we are not recommending that the aged population should now turn to a high-sugar diet. What this study does show is that triggering certain stress responses in cells may translate to longevity, and that activating this stress response with a drug might be critical to decelerate cellular ageing."

Aside from showing that the effect of manipulating this stress response in aged worms, the NTU scientists also showed that the same response, when 'switched off' in young worms fed a high-glucose diet, helped them to live longer than worms on a normal diet.

Commenting as an independent expert, Professor Rong Li, Director of the Mechanobiology Institute at the National University of Singapore said: "Metabolic diseases have serious consequences in the elderly if left untreated. This work is impactful because the scientists identified a cellular pathway, called the unfolded protein response, which affects lifespan in animals fed a high glucose diet. They found that inhibiting this pathway dramatically extended the lifespan of these animals. They therefore propose that targeting this pathway may extend lifespan in humans with metabolic disorder."

Cell's Stress Response Activation

Cells produce a stress response when stressors (such as an excess of glucose) cause a build-up of problematic 'unfolded' proteins in the cell. The stress response, called the unfolded protein response, works to clear up these problematic proteins to restore balance in the cell.

Ageing could also lead to an accumulation of unfolded proteins due a natural decline in the ability of the cell's machinery to produce healthy proteins, triggering the same stress response.

The molecular machinery in the cell tackles this build-up through its 'stress sensors', which initiate a series of molecular mechanisms to rescue the cell from this stress. If the overload of unfolded proteins is not resolved, the prolonged unfolded protein response induces cell death instead.

Unfolded Protein Response

To investigate how the unfolded protein response affects longevity in animals, the scientists induced this response in adult roundworms (Caenorhabditis elegans) using glucose. While C. elegans is significantly anatomically simpler than a human, it relies on many of the same genes that humans do to control the division of cells and to programme faulty cells to die.

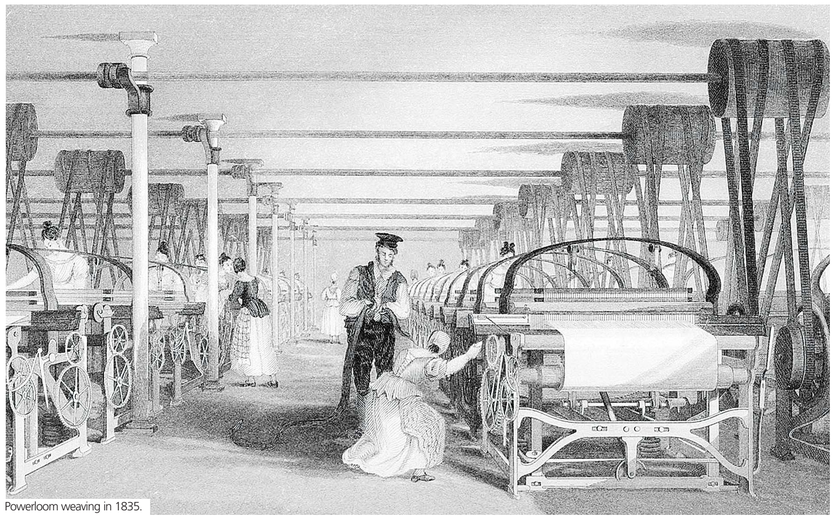
The scientists fed some of the worms a high-glucose diet at two different life stages: young i.e. at the start of their adulthood (Day 1), and at a post-reproductive age (Day 5), when the worms are aged and no longer fertile. A control group of worms were fed a normal diet throughout.

The scientists found that the aged worms given a high-glucose diet lived for 24 days - almost twice the lifespan of the young worms given the same diet (13 days). Worms on a normal diet lived for 20 days.

Aside from living longer, the aged worms on a high-glucose diet were more agile and had more energy storage cells as compared to worms given a normal diet, suggesting healthier ageing.

This Fork In Time... (...1)

The Industrial Revolution was far more than the invention of the assembly line. It profoundly changed our values, culture, and behaviour. It changed how we saw ourselves, how we measured our effort, what we gave significance to, what we ignored, how we taught and learnt, how we assessed and valued one another and the basis on which we measured success and failure. The Industrial Revolution changed the very basis of self-esteem.



Powerloom weaving in 1835.

Mirza Yawar Baig
Naturalist and wildlife conservationist

#LIFE

We are living in a revolution, but it is perhaps not what you may think. Let me explain. We are living today in times that I call, 'Forks in history'. Forking times in history are characterized by turmoil. Epidemics, wars, economic collapse, political instability, civil war and so on. But it is precisely for that reason that the foundations of the structures of society are shaken, and it is given into the hands of ordinary men and women to change the path of destiny. The two World Wars, the First Indian War of Independence, or the Sepoy Rebellion - depending on the historian - in 1857, the American Civil War (1861-65) and others are examples of forking times in history, and we can see what the decisions of those who lived then bequeathed for us. Today it is our time. Let us do differently, so that we leave behind a legacy of honour.

To understand what went wrong, first a bit of history. The Industrial Revolution (1760-1840) was more than moving from handmade to machine-made. It changed three critical things: time of day, family dynamics, and method and content of education. These changes are almost never mentioned but they are far more important than the invention of the assembly line and literally changed our society in ways that one can safely say are irreversible. What are these changes?

The Industrial Revolution

Prior to 1760 society was mostly agrarian. If you want to see what that was like, I strongly advice a visit to the Amish in Pennsylvania or elsewhere. They are people who have decided not to change. Whether that is for the good or not is for you to decide and I am not going to describe it in detail here because for a proper understanding it is essential to visit an Amish settlement. They welcome visitors and tourism is a source of income for them, so please go and visit them. I can assure you that it will be interesting.

The Industrial Revolution changed the time of day from sunrise to sunset, to shift start and knock off in the factory. Your day could begin at 2.00 AM and end at 2.00 PM. And your night was from 2.00 PM onwards or whatever the shift time was. At least one parent never saw their kids awake. This is also how the latchkey kid was born. A kid with the door latch key on a tape round his neck, who lets himself into an empty house when he gets off the school bus. He/she takes food from the fridge and gives himself over to the TV or now, the mobile phone. It is estimated that in America schoolboys watch an average of four pornographic movies per week. With social media, smart phones, and the internet, I can believe that this is a global phenomenon. Let me leave you to figure out what that means in so many ways. As you can see, it was not only about the time of day but of all that came with it.

The second thing it took away was the primacy and value of parents as being their children's teachers, guides, life skills coaches, and breadwinners. The primacy inspired respect and gratitude for parents. It ensured that values of family, community, culture, and religion were alive and continuously reinforced. Work was divided between men and women and boys and girls learnt different life skills from their mothers and aunts and fathers and uncles. This ensured that the bonds of family were strong and everyone, no matter how old or young had a place and value. Parents were valued as role models. Elderly grandparents were not shunted off to an old people's home and left there to die alone. They had influence in all family decisions, were the repositories of family and community history, customs and traditions and were consulted for their wisdom. Serving them was considered an honour and children were eager to spend time with them and listen to stories which served the dual purpose of entertainment as well as being a powerful means of learning important lessons. To this day I recall with great happiness, my time with my grandparents, more than 55 years ago.

The Bases Of Self-Esteem

In the post-Industrial Revolution society, there was neither time nor place for the elderly and they became a burden, sent off to be cared for by paid employees. Values of family loyalty, cohesiveness, culture, manners, even family relationships and the privilege and responsibility that came with them, all went out the window. Even family face time became a scarce commodity because of the conflict of work and school times and demands of both places. Homes became de facto hotels where inmates came and went at will.

With the Industrial Revolution parents went to work. Children no longer knew what exactly their parents did, almost never entered the parent's workplace, didn't learn life skills, or culture, tradition, or religion, from parents. They were sent off to a school where one unrelated adult taught 30/40/50 children. He/she taught a set curriculum and inculcated in the children, his/her own values, which sometimes were totally alien to the child's culture and tradition. Religion was no longer intrinsic to their lives but an extra chore, to be done when it couldn't be sidestepped. The idea that religion was a guide for worldly life became alien and foreign.

In an agrarian society children learn to work with their hands and with animals and other people and learn social and technical skills which give them confidence. Teenagers are given serious responsibilities that impact their families and communities and earn respect. In the post-Industrial Revolution society, childhood merely gets delayed and 'children' in their twenties are dependent on their parents in multiple ways. The new religion is Modernism which seeks to teach its theories as dogma and fact. It is totally materialistic, hedonistic, and worships desire. To fulfil desire is the ultimate goal of life to which end all effort is directed.

The Industrial Revolution was far more than the invention of the assembly line. It profoundly changed our values, culture, and behaviour. It changed how we saw ourselves, how we measured our effort, what we gave significance to, what we ignored, how we taught and learnt, how we assessed and valued one another and the basis on which we measured success and failure. The Industrial Revolution changed the very basis of self-esteem. Just ask the next young person you meet to name three role models and you will see how the bases of self-esteem have changed

Today as I speak, we have entered another far more pervasive, persuasive, and even more transformational revolution, that of Artificial Intelligence in all its forms. We must remember that ever more subtly and for that reason powerfully, technology is not only about its mechanics but even more about the psychological, even ideological changes it creates. Atheism seems to move hand in hand with technological development. The reason is that it gives mankind the illusion of being all powerful and invincible. Of being immortal even in terms of the things we create, if not by ourselves. We are told that with stem cell technology and gene manipulation we can grow what we like in our bodies to cure disease and prolong life, maybe even indefinitely. Granted, much of this is still in the realm of science fiction, like aeroplanes once were. But like aeroplanes, very soon it will become mundane and normal before we know it.

The Future

Let me read the menu for you. How about memorizing the Qur'an and learning Arabic in 5 minutes, and that too if you have a bad internet connection? How about traveling to Russia - you are asking why you would do that – or China – same question – or name your country, which is rich in sights to see but where you don't know the language? But here's the twist - how would it be if you knew the language as soon as you land? To quote Prof. Michio Kaku, the author of Hyperspace, which you should read, "As soon as you blink, your contact lenses will connect you to the internet and if you are not feeling well, Robodoc will tell you what's wrong, prescribe medicines which will be delivered to you. If you are in an accident in a foreign country, you will speak to Robolaw on your watch which knows all the laws of all countries and will advise you what to do." He said much more but I will leave it to your imagination and assure you that what is ahead is more than what you can imagine. That is not difficult to understand because imagination is a function of experience. So, get prepared for a world which will turn our society on its head. Final point, I am not talking about the remote future. I am talking about things that already exist and others which will build on them. We already have Robodoc, Watson, GPS, Siri, self-driving cars and so on. Much more will happen and very fast.

To be continued...

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An Amish Settlement.

The First Indian War of Independence.

The Sepoy Rebellion.

Smart contact lenses.

#ENERGY

Why Do Batteries Lose Charge?

Even when your device is completely turned off or the battery is disconnected entirely, as is the case with power tool batteries removed from the tool, it's not truly off on an atomic level.

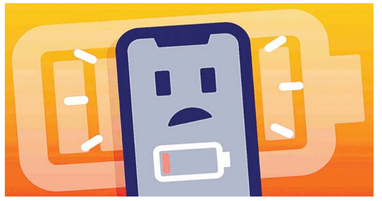
You charge a tablet or a battery pack for your power drill to 100%, put it in a drawer, and forget about it. The next time you pull it out, the battery is dead. What gives? Here's why batteries don't (and can't) stay charged.

All Batteries Lose Charge

Before we dig into the different kinds of batteries, let's look at the biggest overarching concept related to this topic.

Energy doesn't want to stay in one place, it wants to move to reach equilibrium. Take the simple example of heating and cooling your home. In the winter, you must continuously add heat as your home releases heat energy into the cooler environment. And in the summer, you must continuously remove heat, fighting against the energy outside your home.

Although we take them for granted, batteries are a bit of a technological miracle. With batteries, we've managed, improbably, to create a system where we can temporarily store electrical energy in a compact container and access it on demand-and, for the most part, it stays put without escaping into the environment.



Even when your device is completely turned off or the battery is disconnected entirely, as is the case with power tool batteries removed from the tool, it's not truly off on an atomic level. The chemical reaction inside the battery that makes the battery possible is still active, albeit in a much more subdued way than when you're actually using the battery.

This continued low-level activity within the battery slowly depletes the stored energy. It's called self-discharge-electrical discharge in the absence of an external load placed upon the battery-and it's unavoidable.

Different Battery & Different Rates

If you've paid attention to the kind of batteries your different devices use and how often they seem to run down when left off the charger for too long, you've likely noticed that not all batteries are created equal.

While all batteries suffer from self-discharge as a fundamental side effect of their design and, you know, obeying the physical laws that govern the universe, the rate at which they discharge is significantly different. Here are some common rechargeable battery types and how quickly they discharge.

Lithium-ion batteries are the kind of batteries most of us have the most frequent experience with. That's the kind of batteries used in smartphones, smartwatches, tablets, laptop computers, and a wide variety of other consumer electronics like drones, action cameras, Bluetooth speakers, and so on. They're also the kind of batteries found in electric vehicles.

Nickel-metal hydride (NiMH) batteries are rarely used in portable consumer electronics these days but are used frequently in power tools as they cost less than lithium-ion batteries.

Nickel Cadmium (Ni-Cad) batteries are an older technology, now improved upon by NiMH, that was the original portable rechargeable battery type. While the discharge rate was better than NiMH, Ni-Cad suffers from a memory effect and requires more maintenance than NiMH and lithium-ion batteries, making it a less preferred battery type today.

Lead-acid batteries aren't used in portable devices because of their high weight and safety issues stemming from the sulfuric acid bath the lead electrodes sit in. The lead-based design ensures even small lead-acid batteries weigh as much as a modest dumbbell which makes them impractical for anything but stationary applications.

The majority of lead-acid batteries are used for things like automotive starters, off-grid power storage such as you'd use with solar panels and uninterruptable power supplies for computers and other equipment.

How to Slow Battery Self-Discharge

You can't fully stop batteries from discharging, but you can do one simple thing across all battery types to lower the discharge rate: keep them cool.

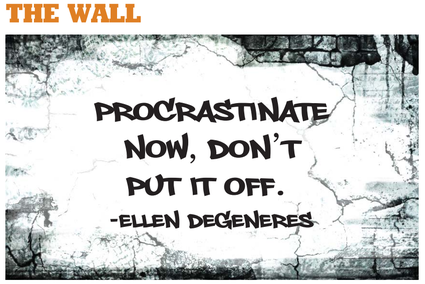
Whether you're trying to keep a lithium-ion or NiMH battery topped off longer, do your best to keep the battery cool.

Cool within reason, of course. Don't put your batteries in the freezer (condensation issues taking them in and out of the freezer can cause serious problems for the advanced internal circuitry found in modern rechargeable batteries), but do everything you can to avoid heat.

To do so, you might consider charging and storing your power tool batteries in your cool basement instead of leaving them out in your sweltering detached garage. You'll also want to keep electronics out of hot cars and store them in the coolest part of your home if they won't be in use for a while.

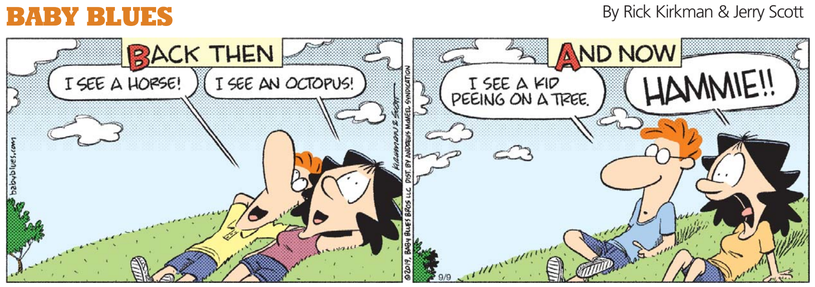
If your batteries are discharging rapidly enough that you practically need to leave them on the charger to ensure they are ready to use when you need them, then it's time to replace them. Batteries degrade over time, even with the best of care, and if a battery is no longer properly holding a charge, it should be recycled and replaced.

THE WALL



BABY BLUES

By Rick Kirkman & Jerry Scott



ZITS

By Jerry Scott & Jim Borgman