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TARIKH: 6 SEPTEMBER 2015 (AHAD)**

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KERATAN AKHBAR
SUNDAY STAR (STAR SPECIAL): MUKA SURAT 1
TARIKH : 6 SEPTEMBER 2015 (AHAD)

Star special

INNOVATIONS MALAYSIA

**Curiosity,
key to
discovery**



The people's guide to the galaxy

By TINA CARMILLIA

"OUR news is dominated by misery," wrote Ben Lillie. "We see invasions and racism and misogyny, drought and starvation and refugees."

"To many of us, science offers a respite from this, a place of curiosity and wonder. There is incredible solace in knowing that the objects of our study – the light from galaxies, the quarks and gluons bound into protons, even the chemical bonds in the strands of our DNA – are oblivious to these things," he continued.

Lillie is a former particle physicist-turned-science writer who specialises in finding stories of how science affects people's lives.

In his *Slate* article "Science Needs a New Ritual", he lamented about the problems that occur when scientists are disconnected from culture and history.

In that May article, he wrote about Hawaiians protesting against building a new US\$1.5bil (RM6.3bil) telescope on the summit of Mauna Kea, a volcano considered sacred to the natives of the island.

The disgruntled reaction from the Hawaiian natives is not unlike the reactions of the natives of Sabah over the recent earthquake that struck the state.

Because the 6.0 magnitude earthquake (the strongest to affect Malaysia since 1976) occurred only days after 10 western tourists stripped and urinated on Mount Kinabalu – considered a sacred place by the natives – the locals believed that the aki (mountain protectors) had become angered by the lewd act.

The earthquake, which claimed the lives of 18 climbers and guides, sparked a debate that pitched local beliefs against scientific accuracy.

At least two academics cautioned against superstition, with one stating that earthquakes are clearly seismic events while another said supernatural beliefs gain traction when inexplicable disasters occur.

The Prime Minister's science advisor Tan Sri Prof Dr Zakri Abdul Hamid subsequently warned against any insensitive remarks while calling for respect and mutual understanding, saying, "Science would have a neutral look. Science has no answer (to the sacredness of the mountain). If the mountain is sacred, we have to respect that."

It is clear that in a community that is diverse in every sense, treading the fine line between science and traditional beliefs is a delicate but necessary act.

While science surrounds us, develops technology for better livelihood and contributes to the future of our civilisation, it is not always welcomed with open arms by the general population.

Vaccination – a medical breakthrough that has saved millions of lives – is still considered "evil" by some, for example.

Journey to the far side of imagination

Science has been harshly misunderstood or misrepresented, especially in the age of information.

When popular astrophysicist and science communicator Neil deGrasse Tyson reviews the technical accuracy of sci-fi films and television, audiences tend to react negatively to his critiques, even doing so openly on his Twitter page.

This is puzzling because he is, after all, the science expert. Would the audience prefer to be misled by pseudoscience instead?

"Science experts do not line up to critique *Cloudy with a Chance of Meatballs*," he explained, referring to the popular 2009 animated film by Sony Pictures Animation.

"To 'earn' the right to be criticised on a scientific level is a high compliment indeed."

When a film or television show aims to popularise science based on a scientific premise but fails to do so in an accurate or at least plausible manner, it loses its credibility because it has failed to achieve its aim, he rationalised.

Of course, scientists should not be too nit-picky about the technical details of sci-fi films or literature – they are produced with entertainment in mind, after all.

A lot of things that happen on television or films do not happen in the laboratories. You cannot pick up a strand of hair and instantaneously be able to identify the individual who owns it with a DNA test, then have his exact GPS location pop up on a computer display.

The rise of the planet of the thinkers

Scientists who turn on their televisions every once in a while to watch forensic crime shows or intergalactic exploration series do so not to find inspiration or gain new ideas – let alone to expect anything realistic.

"However, for the 'real' world, it is a very unfortunate tendency for the public to not pay attention to scientific stories – too hard, they'd say – and it is exacerbated by a tendency for practising scientists to disdain communicating with the public," says Prof Christopher Cramer, professor of chemistry and associate dean at the University of Minnesota.

"The latter point likely reduces the pool of good science journalists as well because if they begin training as a scientist, many will face discouragement if they choose

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Tan Sri Prof Dr Zakri Abdul Hamid

to pursue a career in scientific communication."

Another complicating factor, adds Prof Cramer, is that much of the modern media sees itself competing with the rest of the entertainment industry.

So science is presented in an alarmist fashion (he calls it "gee-whiz fashion") or whatever way that will drive clicks to a website, which rarely paints any sort of picture that informs the non-scientific public.

Prof Cramer emphasises that his viewpoint is perforce US-centric but it is in fact not too far from the realities in Malaysia. By that deduction, it is not surprising if it is true everywhere else in the world too.

The academia strikes back

The case of the meromictic lake in Kerachut Beach in Penang National Park is one local example given by Alianie Mustafa, marine biology researcher and PhD candidate in Universiti Sains Malaysia, Penang.

"The meromictic lake is very rare but no one appreciates it. It is one of only four of its kind in Asia. There was previously some talk of building a large resort in that area, which will definitely affect the flora and fauna as well as the turtle hatchery located nearby," she says.

A meromictic lake has layers of water that do not intermix, which creates radically different stratification of environments for organisms to live in.

Such lakes can form when the basin is unusually deep and steep-sided compared to the lake's surface area or when the lake's lower layer is highly saline and denser than the upper layers.

"On top of that, regular resort maintenance is high but with the delicate balance of the lake's natural conditions and the turtle hatchery to preserve, operational



Mission possible

When a breakthrough in research does make it to the front page, its agents are often badgered with calls for commercialisation.

But not all discoveries lead to products that can be commercialised.

The discoveries of DNA and chemical elements, for example, are research findings that unravel the secret of life and our existence and not the kind to be patented or branded and marketed as these are naturally occurring compounds.

Even when a research does lead to a product meant for commercialisation, it will take years if not decades, for it to enter the market.

The chemical engineering researchers in The University of Nottingham Malaysia Campus, for example, have been working on a turmeric treatment for cancer for the last few

years.

Still, the nanodrug's commercialisation will not be possible until another decade as it will have to undergo different scales of clinical trials and subsequently obtain approval from the regulating bodies.

Nevertheless, budding researchers should not feel demotivated by the realities of research efforts in the real world.

The nation's science, technology and innovation field still has room for growth and the potential to flourish.

Hartalega Holdings Berhad, the world's largest manufacturer of nitrile gloves, is just one of the success stories that Malaysia can be proud of in terms of innovative solutions.

Kuan Mun Leong, managing director of Hartalega Holdings Berhad, advises, "For Malaysia to remain globally competitive, we have to continue focusing on product innovation, technological innovation and talent."

Sure, there will be many hours spent in the laboratories with tedious and perhaps unexciting repetitive tasks, failed experiments, thousands of logs of data to analyse, and many a proposal to write for funding or publication.

While it may not be as swift and cool as it is portrayed in fiction, embrace the quest for new knowledge and know that you are providing useful service to the people, planet – or universe – and future.

costs will definitely soar.

"Would the resort operators actually do that or would they do just the minimal – which would be enough for the business and tourists, but certainly not for nature?" she questions.

The scientific community in Penang, however, triumphed when the development for the resort was halted.

"I'm not anti-development," says Alianie, "but it is rational to demand for sustainability. We need researchers who are not afraid to voice their opinion and for the media to allow our voices to be heard."

However, Prof Cramer cautions that there has also been the extremely unfortunate trend of certain scientific topics becoming aligned with highly polarised political debates.

He claims that the media in general, which has a tendency to avoid committing itself to being an arbiter of truth, treats these issues the way it treats political issues – each side gets to make points in a fashion that appears "fair and balanced".

Yet, as the climate change topic has amply illustrated, that means that scientific opinion that is 99:1 in favour of a certain conclusion (based on 99% confidence interval on various peer-reviewed research studies independent of each other) is constantly presented as 50:50, which is an inaccurate representation – and thus, dangerously deceiving.

