10. p5-no.31

Whether we feel happy or sad, content or discontent, is not determined merely by each individual successive moment of life experience — a good thing happens and I'm happy, a bad thing happens and I'm sad.

While our experiences affect our mood, we are not blown in a completely new direction by each gust of wind.

As humans, we adjust — to new information and events both good and bad — and return to our personal default level of well-being.

There will be highs and lows, but over time, like water seeking its own level, we are pulled toward our baseline — back up after bad news and back down after good.

The euphoria of first love fades, and so does the despair of a break-up.

This tendency is best seen with little kids and their toy joy:

When they get what they've longed for, they believe they will be happy for the rest of their lives.

And for the first few minutes of the rest of their lives, they are.

But then the kids — like adults — adapt.

11. p5-no.32

Although you may put off going to sleep in order to squeeze more activities into your day, eventually your need for sleep becomes overwhelming and you are forced to get some sleep.

This daily drive for sleep appears to be due, in part, to a compound known as adenosine.

This natural chemical builds up in your blood as time awake increases.

While you sleep, your body breaks down the adenosine.

Thus, this molecule may be what your body uses to keep track of lost sleep and to trigger sleep when needed.

An accumulation of adenosine and other factors might explain why, after several nights of less than optimal amounts of sleep, you build up a sleep debt that you must make up by sleeping longer than normal.

Because of such built-in molecular feedback, you can't become accustomed to getting less sleep than your body needs.

Eventually, a lack of sleep catches up with you.

12. p6-no.33

One of the things that makes uncertainty difficult for members of the public to appreciate is that the significance of uncertainty is relative.

Take, for example, the distance between Earth and the sun: 1.49597 x 10 km, as measured at one point during the year.

This seems relatively precise; after all, using six significant digits means I know the distance to an accuracy of one part in a million or so.

However, if the next digit is uncertain, that means the uncertainty in knowing the precise Earth-sun distance is larger than the distance between New York and Chicago!

Whether or not the quoted number is "precise" therefore depends on what I'm intending to do with it.

If I care only about what minute the sun will rise tomorrow, then the number quoted here is fine.

If I want to send a satellite to orbit just above the sun, however, then I would need to know distances more accurately.

13. p6-no.34

Richard Heinberg, an American journalist, argues that in building the renewable energy infrastructure to stop global warming, we are actually involved in one of the greatest change projects in human history.

In addition to solar panels and wind turbines, we have to build an alternative transport infrastructure, farming procedures and industrial processes.

This transformation cannot happen without fossil fuels.

For instance, production of concrete structures and steel elements require amounts of energy that is only possible to produce with fossil energy.

Production of solar panels requires scarce and expensive minerals which must be excavated, again requiring the use of fossil fuels.

Thus, the harder we push towards a renewable energy system, the faster we have to use fossil energy for the construction process.

This is not only expensive, but also an undermining factor for our efforts to cut global emissions.

Heinberg remarks that the cost of building this new energy infrastructure is seldom counted in transition proposals, which tend to focus just on energy supply requirements.

14. p6-no.35

Humans for centuries have dreamed of machines that could become intelligent and make human-like decisions.

There have been myths about robots, automatons, and artificial beings since ancient Greece (e.g., the myth of Pandora, who released ills upon the world).

Likewise, literature throughout history has dreamed of creating human-like creatures and thinking machines (e.g., Mary Shelley's Frankenstein).

In 1950, British mathematician Alan Turing asked whether machines could think and reason like humans and then developed the Turing test to measure a machine's intelligence and whether the machines can think autonomously.

A few years later, MIT professor John McCarthy coined "artificial intelligence," replacing the previously used expression "automata studies."

Since then, artificial intelligence has become the study and practice of "making intelligent machines" that are programmed to think like humans — endowed by their creators with reasoning and learning.

15. p6-no.36

The desert tortoise has a simple solution for coping with Death Valley's extreme heat: It avoids it.

The slow-moving creature hibernates during the winter and stays in its tunnel for much of the summer, meaning that it spends more than 90 percent of its life immobile.

In fact, the tortoise usually only surfaces after a good rain.

Then, it gets to work.

The tortoise stocks up on water by eating plants and digging holes to collect rain.

But to stay supplied with water through its extended hibernation, the reptile relies on something else — its highly sophisticated bladder.

Unlike most animals, the tortoise's bladder acts as a holding tank, allowing it to reabsorb water back into its body.

Incredibly, a desert tortoise can go a full year without taking in any freshwater at all.

And because its bladder is so important to a tortoise's survival, park rangers often remind visitors not to stop and help the slow-movers across the road.

Tortoises become so terrified when people pick them up that they empty their bladders, losing their precious water reserves.