

imposed by central banks, which also control the quantity and value of the money issued: under-issue and you have a credit crunch; over-issue and ultimately you could end up with Weimar Republic- or Zimbabwean-style hyperinflation.

### The power to control the reserve currency

Rome was not the first, but it is certainly the most documented, empire to recognise the advantages of enforcing a centrally controlled currency on conquered subjects. Caesar ruled from Rome, but the impact of his monetary decisions was felt in every corner of the empire. Yet few would attribute the rising price of bread to Caesar's decision to mix lead with silver. The change was slow and filtered through many layers, thus masking the cause from the effect. And this is the beauty of the banking system today.

"Whose likeness and inscription is this? They said, 'Caesar's'. Then he said to them, 'Therefore render to Caesar the things that are Caesar's, and to God the things that are God's'" (Mt. 22:20,21, ESV).

It is interesting to view the statement of Jesus from this perspective. Such a statement might sound strange. Most people think their money belongs to them, but it does not. Christ is correct; Caesar issued the money, Caesar controlled its value, and Caesar could manipulate its purchasing power.

Nothing has changed. Take out a note from your wallet and examine all the signatures and names. You will find the name of the Central Bank Governor listed. These are the owners and controllers of our money, and we have no say in the decisions they make over the value of our labour and savings. Money and God are placed side by side on more than one occasion in the Bible. We need to question what money is, what gives it value, who controls it and how. The answers may surprise us, but herein lies the power of king of Tyre.

### Who is the king of Tyre today?

If we were to identify specifically who the king of Tyre is today it could be a very difficult exercise. As a system, however, there is little doubt that the king of Tyre is represented by the banking system, in particular the central banks which control the issue of a nation's money supply. Currently the United States dollar is the currency of world trade, so the king of Tyre is an individual or group of individuals who set and manipulate the value of the dollar.

In the next article we will consider the connection between Tyre and the Jews, the judgement and migration of Tyre and its relevance to today's economic crisis.

(To be concluded)

# Science update

## Recent news from the world of science

David Burges

### Insect antifreeze<sup>1</sup>

AS THE COLD of winter approaches we may give some thought to the problems of survival faced by many birds and animals confronting sub-zero temperatures. For some, migration to warmer climes is the solution, while others resort to hibernation. Perhaps we give less thought to the way that insects and spiders survive without the benefit of

insulating fur or feathers. The real threat they face is not from the cold itself but from the formation of ice. Since cells and the spaces between them consist mostly of water, the rapid growth of ice crystals disrupts the fluid balance and causes irreparable damage to the cell membranes.

Some insects do migrate, the monarch butterfly of North America being the best known example, and others survive by burrowing into holes or burrows.

But many insects survive by producing their own antifreeze chemicals. These lower the freezing point of water sufficiently to avoid ice formation and so protect the cells. The first animal antifreezes were discovered several decades ago in the

1. Sean B. Carroll, "When built-in antifreeze beats a winter coat," *New York Times*, Nature section, 18 Jan. 2010, kindly supplied by a reader.

blood plasma of Antarctic fish species. These fish antifreezes are special protein molecules with unusual repeating structures that bind to the water molecules and lower the temperature of ice formation by nearly 2° Celsius, which is just enough to prevent freezing at the normal ocean temperature.

Land-based insects have to survive even lower temperatures, but some have been found to employ similar proteins to provide protection against freezing. The so-called snow flea, actually a wingless insect from the springtail family, is still active on snow banks at temperatures as low as -7°C. It uses its own version of antifreeze protein, different from that of the Antarctic fish. And in fact most of the insects using this form of protection seem to have their own unique antifreezes.

Some insects, however, survive much lower temperatures by actually allowing themselves to freeze. They produce chemicals such as glycerol and other types of alcohol compounds which do not prevent freezing but slow ice formation and allow the fluids *surrounding* the cells to freeze in a more controlled manner while the *contents* of the cells remain unfrozen. For example, the *Upis* beetle, which lives in central Alaska, freezes at around -30°C but remarkably can survive temperatures as low as -75°C. Recent research has shown that, unlike the protein antifreezes of other beetles, snow fleas and moths, the *Upis* antifreeze is a complex sugar called *xylomannan* that is as effective at suppressing ice growth as the most active insect protein antifreezes.

Research teams are now exploring how to apply these insights from the insect world to the problem of human organ

preservation for transplant surgery, how tissues can be frozen for a long time and then thawed out successfully. Biologists naturally attribute the wide range of insect solutions for avoiding freezing to the 'inventiveness' of evolution. There is, however, no opportunity for the gradual development of such strategies in the real world: an insect either has its antifreeze and survives the winter or it is dead! It seems on the contrary that the supremely 'inventive' Creator has designed the optimal solution for the needs of each kind of creature.

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## Man and space travel

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THE gospel message involves the wonderful prospect of eternal life on a glorified earth, in accordance with the promises of God, for "those who wait on the LORD, they shall inherit the earth" (Ps. 37:9).<sup>\*</sup> But man has other ambitions. In April 2010 President Obama set a new target for America's space programme of sending astronauts to Mars by 2030. This is just the latest manifestation of man's desire to leave the earth and explore the cosmos. Some scientists speak optimistically of colonising Mars in the future, or even of settling planets in other solar systems, after the manner of science-fiction film series such as *Star Trek*. The astrophysicist Stephen Hawking has claimed that, with the ever-increasing danger of man destroying himself on Earth, humans need to colonise space within two centuries or face extinction.

Yet a sober assessment of the effect of long-term space travel on human biology makes it quite unlikely that man could even reach Mars and survive.<sup>2</sup> Our bodies are in fact intimately connected to the environment of

Earth, because to function properly we need gravity. The experience gained in the operation of the International Space Station has shown that prolonged exposure to the microgravity of space has serious effects on human physiology.

One of the first organs to be affected is the heart, which shrinks by as much as a quarter after just one week in orbit, reducing blood pressure and the amount of blood being circulated. Returning astronauts suffer blackouts and dizziness because blood no longer reaches their brains in sufficient quantities. One week in space has about the same effect as six weeks in bed. Other muscles suffer similar effects from weightlessness, especially those such as the thighs and calves which normally resist gravity by supporting the weight of the body. Despite the use of exercise machines, crew members lose a third of their leg muscle power after six months in space.

But the most serious effect of space travel is bone loss. Although the hardness and strength of bone give it an appearance of permanence, it is actually a living, flexible tissue, which responds to the loads placed on it.<sup>3</sup> During prolonged weightlessness, bone demineralises at a steady rate, and after six months some astronauts lose a quarter of the material in their shin bones. A three-year mission to Mars could result in crew members losing around fifty per cent of their bone material, which

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\* Scripture quotations from the NKJV.

2. Theunis Piersma, "The impossible frontier," *New Scientist*, 13 Nov. 2010, p. 30.

3. See article: "[Bone of my bones.](#)" *Testimony*, [Aug. 2009, p. 237.](#)



**The International Space Station.**

would make it very difficult for them to return to Earth. Added to these effects of weightlessness is the serious danger presented by radiation from the sun, especially in the event of solar flares. The weight of totally protective shielding for such a mission would be prohibitive, and the crew would be exposed to the danger of developing cancers and other forms of radiation damage.

Scripture declares definitively that “The heaven, even the heavens, are the LORD’S; but the earth He has given to the children of men” (Ps. 115:16). Although this verse was erroneously used in the past to predict that man would never venture into space, it remains true that the human frame, fearfully and wonderfully made, has been designed by the Creator for life on this planet and the glorious future He has planned for it. The survival of life on Earth is in the hands of God, not the space programme. To quote Professor Piersma, the author of the referenced article: “In our futuristic ambitions we should not forget that our minds and bodies

are connected to Earth as by an umbilical cord.”

### **A polar mystery<sup>4</sup>**

OVER the past ten years, thousands of marine biologists have been engaged in a major project to complete a census of the creatures in the world’s oceans, involving hundreds of research voyages around the globe. A significant number of these have been to the Arctic and Antarctic polar regions. Among the mysteries they have been seeking to solve is one dating back to the 1840s and the voyages of the Victorian explorer James Clark Ross.

Ross collected samples of marine flora and fauna from the two polar regions that looked remarkably similar. These tiny species of worms, snails and crustaceans, mostly no bigger than grains of rice, are specially adapted for existence in frigid waters, yet appeared to have migrated through many thousands of miles of warmer waters to reach the opposite poles. In the following years there has been much debate about the findings,

some scientists doubting that the similarities were even real.

Now the Census of Marine Life has compounded the mystery by identifying 235 identical species that inhabit the two regions but are found nowhere else. Furthermore, DNA analysis of three species of single-celled ocean drifters from the sub-polar waters off Iceland and the Falkland Islands respectively has shown that they are genetically so similar that they must have been mixing in very recent times. Some scientists and naturalists, including Darwin himself, surmised that the species migrated over thousands of years before the last ice age when it is considered that ocean temperatures were much colder. But the genetic data seems to indicate that the creatures have been in contact much more recently.

Some scientists speculate that a deep underwater current called the thermohaline circulation<sup>5</sup> must interconnect the two poles and allow transfer of species from one to the other. The complete cycle of this circulation, however, can itself take thousands of years, and this theory fails to explain why to date no examples of these polar species has been found in the other oceans.

Further research may produce a naturalistic solution to this mystery. Meanwhile an equally valid explanation seems to be that these specialised marine creatures were created at the

4. Daniel Grushkin, “Same Species, Polar Opposites: The mystery of identical creatures found in both Arctic and Antarctic waters,” *Scientific American Online*, 22 Feb. 2010.
5. See article: [“Science and the Creator: This great and wide sea.”](#) *Testimony*, Jan. 2004, p. 26.

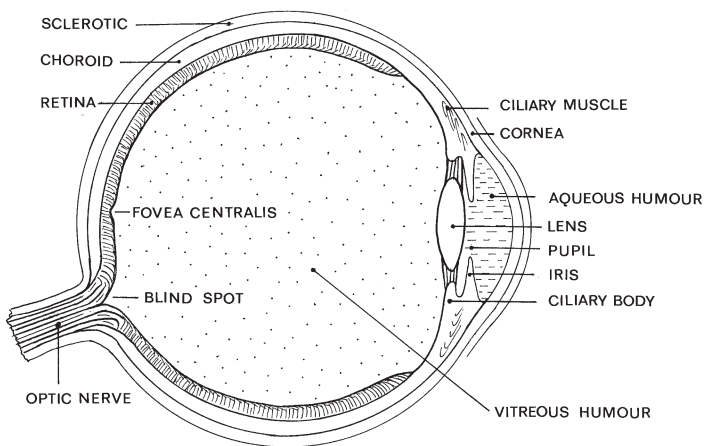
same time by God: “O LORD, how manifold are Your works! In wisdom You have made them all . . . This great and wide sea, in which are innumerable teeming things, living things both small and great” (Ps. 104:24,25).

## The principle of optimisation

THE creation record in Genesis declares that God “saw everything that He had made, and indeed it was very good” (Gen. 1:31). Wherever we look in the living world, we see ample testimony to these words. It has, however, become something of a game amongst evolutionists seeking to pour scorn on the concept of intelligent design to describe features of living creatures, especially man, which they claim have been poorly designed.

An often cited example is that of the retina of the human eye, in which the connecting nerve fibres are routed in front of the light-sensitive cells, and thus give rise to the ‘blind spot’ where they pass through the retina to the optic nerve. This is deemed ‘poor design,’ even though it has no detrimental effect on our eyesight and we are normally quite unaware of the blind spot.

In complete contrast, a recent review article reveals that scientists have realised that the photoreceptor cells in the retina are not simply ‘good’ at their function but operate at the extreme limits of the laws of physics.<sup>6</sup> Each cell is capable of responding to a single photon, the smallest particle of light, which means



The human eye.

that it is as ‘good’ as it possibly can be.

These super-efficient photoreceptors illustrate the ‘principle of optimisation’ which scientists are increasingly recognising in many key features of the natural world that are found to display the highest possible peaks of performance, the very limits allowed by the laws of physics. Thus bacteria such as *E. coli* are able to navigate their way unerringly to food through a chemically confusing environment. They do so, with astonishing efficiency, by comparing the signals from surface receptors at their forward and rear ends and moving towards the source with their remarkable flagella, whip-like rotating tails.

As another example, it is known that sharks can detect their prey by measuring minute electrical fields in sea water, as small as one millionth of a volt, roughly the amount that would be produced by a standard AA battery with its poles 1,000 miles apart. Again, biophysicists

have calculated that the sharks’ detection system could not be more sensitive, given the existing physical constants in our world. In contrast, most machines and processes designed by man operate at much lower levels of efficiency, and scientists constantly study such living systems in order to copy them—so-called biomimetics.

Perversely, scientists credit blind, directionless evolution with having achieved these marvels of performance in the natural world, while giving no real explanations of the mechanisms by which these exquisitely refined organs could have achieved such perfection. But we can recognise them as the superior handiwork of the Almighty Designer and assent that indeed the works of God the Creator are “very good.”

6. Natalie Angier, “Seeing the Natural World with a Physicist’s Lens,” *New York Times*, Science Section, 1 Nov. 2010, kindly supplied by a reader.