

Science Update

Recent news from the world of science

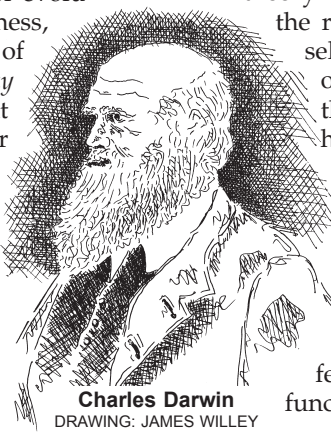
David Burges

Darwin's illness

IT IS NOT widely known that Charles Darwin, prime originator of the theory of evolution, suffered from a mystery illness, which afflicted him from the age of twenty-two. An article in the *Sunday Telegraph*,¹ commenting on a recent scientific paper,² reports that, save for the four years of his voyage aboard *HMS Beagle*, it plagued him for the rest of his life. His symptoms included the frequent vomiting, diarrhoea and flatulence of a stomach disorder, and also headaches, rashes, boils and palpitations. His son wrote that "his life was one long struggle against the weariness of strain and sickness".

Doctors of the time were unable to provide any relief, and subsequently many have sought to explain his symptoms, dividing almost equally between those who believe he had some undiagnosed physical ailment and those who have considered it a psychiatric condition. Now two specialists from the University of Wales have reported that Darwin's symptoms match exactly those of intolerance to lactose, the natural sugar present in milk and dairy products. They noted that Darwin himself observed that the sickness usually started two hours after a meal, which is the time it takes for lactose to reach the large intestine, and that he found relief only during his voyage on *HMS Beagle*, when no fresh milk was available. On the other hand, his symptoms were perpetuated by the Victorian practice of invalids taking bread and milk as a nightcap.

The researchers only made the link with Darwin's illness after diagnosing it in a woman who had suffered the same symptoms for fifty-three years. Clearly the medical profession still has problems identifying the condition! She was restored to health after just a month of excluding dairy products from her diet. It seems that other food intolerances, such as coeliac disease (gluten intolerance), can likewise present a variety of perplexing symptoms.



Charles Darwin
DRAWING: JAMES WILLEY

The writer of the article makes the perceptive, and welcome, comment that the cause of Darwin's illness is a potent argument against his own theory of evolution!³ Human beings have the remarkable ability to sustain themselves with an almost infinite variety of different foods. This is because the lining of the gut contains several hundred enzymes and hormones capable of breaking down sugars, fats and proteins, to be absorbed into the bloodstream and liver. He points out that the chances of these all evolving by chance is infinitesimally small, the more so when we see the devastating effects when just one is missing or not functioning correctly.

The arrow of time

IT IS a commonplace that our lives are bounded by time, and every activity we undertake involves its passage. In the words of Ecclesiastes, "To every thing there is a season, and a time to every purpose under the heaven" (3:1). We are familiar, too, with the fact that time always moves in the same direction. If we break a glass, the pieces of broken glass stay separate; we never see them coming together again. And although our bodies normally grow with temporary vigour to adulthood, yet the inexorable processes of decay soon set in and we head towards the inevitability of the grave, for "All go unto one place; all are of the dust, and all turn to dust again" (v. 20).

It seems obvious, then, that time has an arrow that always points in the same direction and that

1. Dr James Le Fanu, "A diagnosis for Darwin, 175 years too late"; feature in the *Sunday Telegraph*, 15 May 2005, kindly submitted by a reader.
2. Professor Anthony Campbell and Stephanie Matthews, "Darwin's illness revealed", *Postgraduate Medical Journal*, Apr. 2005, pp. 248-51.
3. Dr Le Fanu has been quoted before as a nonbeliever in evolution: see "[Science Update: A vital cleaning agent](#)", *The Testimony*, Mar. 2004, pp. 83-84.

we take for granted.⁴ Yet strangely there is nothing in the laws of physics, describing the behaviour of matter and the forces acting upon it, which says that it cannot point in the other direction. This has long been a puzzle to theoretical physicists. Einstein demonstrated in the theory of relativity that time is a fourth dimension, corresponding to the three spatial dimensions. Yet of these only time can be measured in one direction only.

This direction of time is found to depend upon the fact that the property of *entropy*, a measure of *disorder*, always tends to increase. Pour milk into a cup of coffee and the two ordered liquids mingle randomly, become thoroughly mixed, and cannot easily be separated again. When we drive a car, the highly ordered fuel is burnt and ends up as water, carbon dioxide and waste heat. The arrow of time is thus determined by an ordered, low-entropy, beginning and a process of mixing, resulting in a disordered, high-entropy, state.

What is true on the small scale must apply to the universe as well. Scientists have confirmed that the cosmos was born in a low-entropy state because it is filled with a very uniform microwave background radiation,⁵ but they have no idea why. If the universe is likened to a clock, then it began its existence fully wound! The *New Scientist* article (see footnote 4) quotes the work of some physicists who are seeking explanations in a complex, 'negatively curved' geometry of the universe.⁶ Of course, the true explanation, unacceptable to those scientists who seek only 'natural' descriptions, is that the universe was created by God, and that the arrow of time was

imposed upon it by the Creator, Who is "from everlasting to everlasting" (Ps. 90:2).

How relevant are the words of the Preacher: "I have seen the burden God has laid on men. He has made everything beautiful in its time. He has also set eternity in the hearts of men; yet they cannot fathom what God has done from beginning to end" (Eccl. 3:10,11, NIV)! Nevertheless, the arrow of time does not mean that the world will end in the state of completely random disorder (or chaos) predicted by science, for God has promised a new creation in which all things will be wonderfully restored to give Him the glory.

The song of birds

A RECENTLY published book⁷ explores the intriguing question of why birds sing. Birdsong has delighted mankind for centuries, inspired poets and fascinated scientists. The English poet George Meredith wrote of the skylark:

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4. Amanda Gefter, "The riddle of time", *New Scientist*, 15 Oct. 2005, pp. 30-33.
 5. See "[Science mysteries: The horizon problem](#)", *The Testimony*, Oct. 2005, p. 401.
 6. Amanda Gefter, p. 30.
 7. David Rothenberg, *Why Birds Sing: A journey into the mystery of bird song*, Basic Books, 2005; reviewed in *New Scientist*, 18 Jun. 2005, p. 51. Examples of birdsong and accompanying music by the author can be heard at www.whybirdssing.com.
 8. Information gathered from www.garden-birds.co.uk/information/birdsong.htm.



Singing male Chaffinch

He rises and begins to round,
 He drops the silver chain of sound,
 Of many links without a break,
 In chirrup, whistle, slur and shake.

For singing till his heaven fills,
 'Tis love of earth that he instils . . .

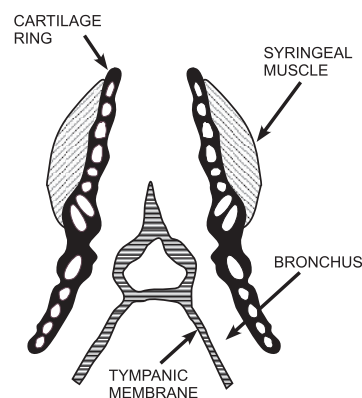
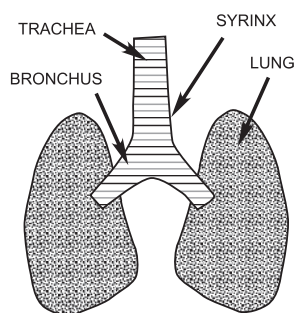
It is well known that birdsong has a major role in courtship prior to mating, and in defending a territory. Scientists have gathered evidence suggesting that birds are born with a basic ability and vocabulary to sing, but that they also copy or mimic their parent's calls and songs and those of other mature birds.

A bird's vocal cord, or syrinx, is simpler than that found in humans.⁸ Instead of being located in the larynx (Adam's apple) at the top of the wind-pipe (trachea), it is located at the bottom, much closer to the lungs. The avian larynx at the top of the trachea serves no purpose in vocalisation and only prevents food and water from entering the lungs.

Sound is generated when air flowing through the narrow syringeal passage causes the tympanic membrane to vibrate like a drum skin. Muscles alter the tension of the membrane, like tightening a drum skin, and this alters the frequency or pitch of the notes. Remarkably, the position of the syrinx, at the top of the two bronchi, means that birds can sing two different notes simultaneously!

Calls usually have a specific purpose. For example, a party of long-tailed tits are constantly chattering to one another with contact calls, whilst the blackbird utters a rapid scolding alarm call when a predator appears. Some species, such as gulls and kingfishers, do not have songs, but most others, and especially perching (passerine) birds, do. Perhaps the outstanding demonstration of birdsong is the dawn chorus in spring and summer. This begins before sunrise with one or two birds singing, usually starting with the blackbird, followed by the song thrush, robin, wren, great tit and chaffinch. Gradually birds of other species join in, until there is a symphony of song.

Remarkably, the purpose of the dawn chorus is not known. Scientists have advanced several possible and very prosaic explanations, such as sound travelling farther in the cool air of dawn, or that singing influences the female reproductive cycle and nest building. But these hardly serve to explain the beauty of the result or that it should continue so long. In fact the book faces the fact that birdsong is more beautiful and also more elaborate than it needs to be from a strictly



DRAWINGS: DAVID WILLEY

practical viewpoint. Just as many birds can be observed flying or soaring in the sky for no obvious purpose other than the sheer enjoyment of flying, so it seems that they sing because they enjoy doing it, and we humans likewise respond to the beauty of it.

The author of the book, a musician himself, notes that birdsong has many of the qualities that define music, including rhythm, structure, pattern, repetition and variation. He acknowledges that there is no survival advantage in this type of behaviour; in other words, there is no biological reason why it should have evolved. Science is no nearer than poetry to fathoming the source of the birds' melodious output. But we who believe in the God of creation, Who made all things very good, understand well enough that here is yet another example of His genius and goodness. Besides its practical uses by the birds, birdsong was surely designed for God's and man's pleasure.

The Song of Solomon joyously pictures the day of resurrection, the morning without clouds, as a glorious spring morning, adorned by the dawn chorus: "Rise up, my love, my fair one, and come away. For . . . the flowers appear on the earth; the time of the singing of birds is come, and the voice of the turtle[dove] is heard in our land" (2:10-12).