

nt&Leters

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Editor, 24-28 Tara St, Dublin 2

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Letters may be edited or cut.

Dublin Zoo's baby elephant

Madam, - I should like to suggest that Dublin Zoo's baby elephant be called Tara. As elephants in Asia have royal associations, it is highly appropriate that the new calf be named after the seat of Ireland's High Kings. Furthermore, the name Tara features in Indian mythology, as a deity is revered in both the Hindu and Buddhist traditions.

As elephants in the wild face increasing threats to their survival, this new arrival is truly a cause for celebration. It is also interesting to note that she was born within days of the announcement that a new national monument was discovered near the Hill of Tara, a find that may yet be the salvation of the royal valley. - Yours, etc,
LAURA GREALISH,
Glen of the Downs,
Co Wicklow.

Madam, - Let me see if I've got this right so far. There is an elephant in the room. It is very small but will some day be huge. And the public is not allowed to go there until after the election? - Yours, etc,
CIARAN O'REILLY,
Windsor Park,
Belfast 9.

Outcome of the 'Miss D' case

Madam, - Contrast the unnecessary attention bestowed by the HSE on the unborn child of Miss D with its inaction in the sad case of the Dunne children in Wexford when help was so clearly needed. We Irish are world-renowned for protecting the unborn and revering the dead. It seems to be just in the period between birth and death that the HSE, and we as a nation, so often fail our people. - Yours, etc,
JOHN GISENAN,
Institute,
Co Kilkenny.

Madam, - With reference to your editorial of May 10th, since

An Irishman's Diary

This month marks a significant anniversary for science and society; just 100 years ago, the first clear evidence that our planet is over a billion years old was uncovered. The discovery was a great relief for scientists as it resolved a bitter dispute between several scientific disciplines. However, it was a blow for religion, as it scotched estimates of the age of the earth based on sacred texts.

The most famous estimate of the age of the earth had been provided by Archbishop James Ussher of Armagh in 1654. A long and painstaking analysis of the genealogy of the Bible led the archbishop to conclude that the earth was created on October 23rd, 4004 BC. This estimate was included in the King James Bible and became widely accepted as the age of the earth in the Christian world.

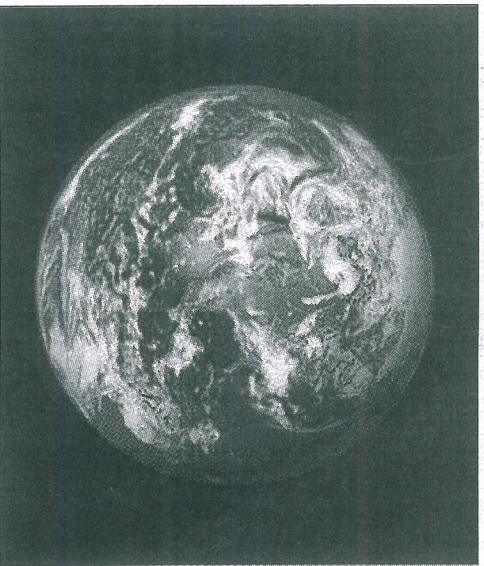
(That the earth was only a few thousand years old was explained by proposing that the planet was shaped by a series of giant disasters.) Ussher's estimate was first contested by the British engineer William Smith, in the 18th century. On studying fossils buried in deep layers of rock, Smith concluded that the earth must be a great deal older than a few thousand years. Smith's idea was pursued by geologists such as Charles Lyell, who came to believe that the surface of the earth was the result of gradual processes of change that had occurred over vast geological ages.

The age of the earth came under scrutiny in a different area of science in 1859, when Charles Darwin published his startling but highly impressive theory of evolution by natural selection. The process of evolution necessitated an extremely long time for complex organisms to evolve: for Darwinians, the earth had to have been formed billions of years ago.

It seemed biology and geology were in agreement with each other, if not with theology. However, the cosy scientific consensus was destroyed by the

Cornac O'Riartaigh

distinguished physicist William Thomson (later Lord Kelvin). To determine the age of the earth, Belfast-born Thomson calculated how long it would take the earth to cool from a molten ball of rock, using well-known laws of heat. His analysis suggested that the earth could not be more than 40



Old Mother Earth: It is just 100 years since science established the approximate age of our planet

million years old. The result shocked biologists and geologists, yet Thomson's calculations seemed unassailable.

The dispute between physics and the natural sciences lasted for decades. Eventually, Darwin and his supporters came to believe that some unknown natural process must exist that had not been taken into account in Lord Kelvin's work - a prediction that was to prove remarkably prescient. In 1896, the extraordinary phenomenon of radioactivity was discovered. By 1903, Pierre Curie had demonstrated the significant heating effect of radioactivity (a rock sample containing the element radium could generate enough heat to melt its own weight in ice in an hour). Since Lord Kelvin's calculations took no account of this spontaneous heating, his estimate of the earth's age was fatally flawed and the Darwinians breathed a sigh of relief.

Better still, it became apparent that radioactivity itself could provide a new, accurate

method for dating the earth. In 1904, the great physicist Ernest Rutherford discovered that atoms of a radioactive element decay into atoms of another chemical element at a fixed rate. Rutherford realised that if the "decay series" of a given radioactive element was known, the age of a material containing that element could be determined from its chemical composition.

One of the pioneers of the new radioactive dating technique was Bertram Boltwood, a young chemistry graduate at Yale University. Inspired by a seminar given by Rutherford at Yale, Boltwood embarked on a comprehensive study of rocks containing the radioactive element uranium. By May 1907, he was able to date the rocks of several different minerals containing uranium. Although his method contained some slight inaccuracies, the result was spectacular: from their radioactivity, the rocks had to be over a billion years old!

Boltwood's result was met with indifference at first, as most geologists distrusted the new radioactive dating method. However, decades of work by the geologists John Joly of Trinity College Dublin and Arthur Holmes of the University of Edinburgh gradually established the accuracy of the technique. In 1926, it was agreed at the US National Academy of Sciences that radioactivity provided the most reliable geological timescale. Since then, the ages of the oldest terrestrial rocks have been studied in great detail, and it is now universally accepted that the earth is 4.5 billion years old.

Universally? Well, almost. ● A description of the lives and works of William Thomson and John Joly can be found in the book *Physicists of Ireland* (ed. McCarthy and Whitaker) published by the Institute of Physics.