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Tuesday 18 April 2006

SCIENCE NEWS

Venus express

A spacecraft the size of a garden shed has arrived above the planet Venus, to the delight of the European Space Agency.

Body show concerns

The latest human body parts exhibition in London has sparked anxiety over the origins of the human remains from China.

Love's labour lost

Canada's new prime minister has been urged to review the global warming policies he inherited from his predecessor.

Online price war

Broadband costs are expected to plummet following the launch of Britain's cheapest phone and internet package.

ADVICE

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PREVIOUS

LANGUAGE

Alphabets are as simple as...

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COMMENT

View from the lab

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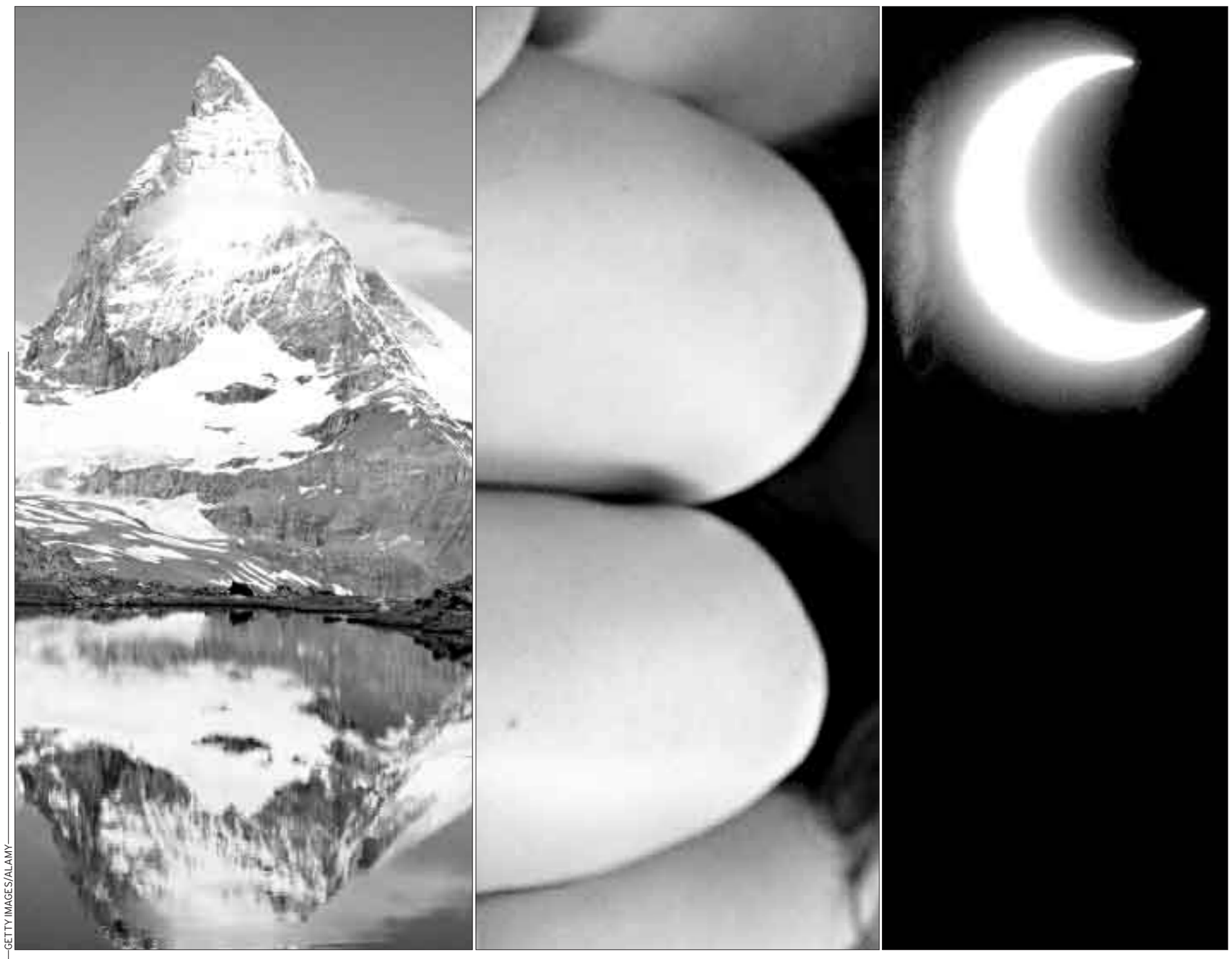

GETTY IMAGES/ALAMY

...ABC, otherwise familiar as mountains (the Matterhorn), knees and the crescent moon

If there is one quality that marks out the scientific mind, it is an unquenchable curiosity. Even when it comes to things that are everyday and so familiar they seem beyond question, scientists see puzzles and mysteries.

Look at the letters in the words of this sentence, for example. Why are they shaped the way that they are? Why did we come up with As, Ms and Zs and the other characters of the alphabet? And is there any underlying similarity between the many kinds of alphabet used on the planet?

To find out, scientists have pooled the common features of 100 different writing systems, including true alphabets such as Cyrillic, Korean Hangul and our own; so-called abjads that include Arabic and others that only use characters for consonants; Sanskrit, Tamil and other "abugidas", which use characters for consonants and accents for vowels; and Japanese and other syllabaries, which use symbols that approximate syllables, which make up words.

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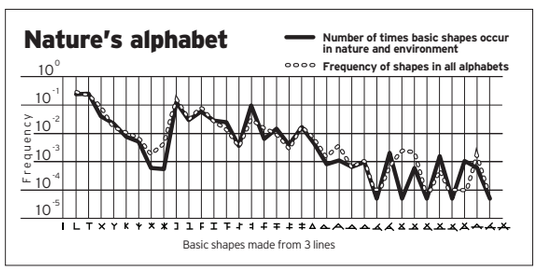

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"Vertebrates have evolved for tens of millions of years with their visual systems having to be good at recognising the configurations that are common out there in nature," he said. "We don't have really good mechanisms for recognising shapes that don't often occur in nature." As a result, letters and symbols based on rare natural shapes are themselves rarities.

Given how the distribution of features in our world is so similar, whether from an urban or a rural environment, the team would not expect writing systems that evolved among peoples who lived in desert regions to differ much from those of tribes in tropical rainforests. Nor does he expect keyboards to have much impact: "Despite the growth in the number of fonts, almost none of which is written by hand any more, they appear to possess the same shapes as they always did."

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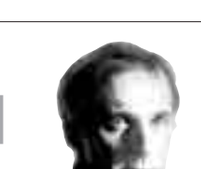

Prof Steve Jones explains why, once in a green moon, physicists are going lunar

In 2006, for once in a blue Moon, there will not be a blue Moon. We had one last year, but the next is not until May 2008. Britain saw a red (or orange) Moon seven years ago, but does not expect another before 2090. That ole yellow Moon will be around in three weeks or so if the weather is good, but a green version is at this moment eagerly being watched by physicists.

What is our lunatic satellite up to in this season of Easter, of death and renewal (its date set by the ecclesiastical Moon, the "average fictive Moon according to the Metonic cycle")?

The reddish-orange version happens during total eclipses, when our neighbour takes on that hue against the bright ring of the Sun and the yellow variety (as in the pop song) when it sits low in the sky and is seen through a thick, rather than a thin, layer of murky air. The blue Moon itself is an ancient expression of disbelief, but science in its boring way has come up with some alternatives: its colour might come from volcanic dust or it may just be the name for a second full Moon in a single calendar month (an event that happens about every three years). Nobody knows and, frankly, who cares?

The green Moon, though, is for real. It is helping to set the date of Easter for billions of years from now and to penetrate some baffling questions about the birth and death of the Universe. It may also suggest just when that other great ecclesiastical festival, the Apocalypse, will take place.

The whole satellite is not green, it is just a patch of dust a mile across illuminated by a laser beam shot from the Apache Point Observatory in New Mexico.

The beam is reflected back from one of several reflectors left on the Moon's surface, with a delay that – given the known speed of light – makes an exquisitely precise statement of the distance between the two points. It scatters and spreads on its way to and from its target and the return signal on Earth, a dim smear 10 miles across, is weak indeed.

Even so, the Apache Point telescope is accurate enough to pick up the movement of the continental plate the observatory sits on and the flexing of the ground beneath as weather fronts pass over.

It has already fixed the distance to the Moon to within a millimetre and, as the skies clear this spring, the astronomers promise to do even better. They hope to test the Einstein equivalence theory – the notion that gravitation is the same everywhere in the universe. That might seem obvious: jump from the 50th floor in London or in Tokyo and you will die at the same instant.

Einstein himself said that, if it were not true, he "would feel sorry for the dear Lord" (a sentiment that might interest the Inquisition). However, his idea does not sit easily with some uncomfortable facts. Why was there a Big Bang and why is the Universe not just expanding, but doing so faster and faster? In the strange world of strings, branes, and universes that come back from the dead after a Big Crunch, today's theologians of physics are muttering that his dogma might indeed be wrong.

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Gravity, though, is such a weak force that huge masses are needed to check it. The laser test is a high-tech version of Galileo's Leaning Tower of Pisa experiment, in which a heavy and a light object landed at the same instant; but now the light and heavy bodies are the Moon and the Earth. Are they accelerating towards the Sun at the same rate? To do so, we need to know the exact shape of the lunar orbit and that is what the green patch is all about.

So far, Einstein's equivalence appears to be accurate to within one part in 10 billion, but, in the world of quantum physics, that estimate is crude and a lot more green light is needed to illuminate the truth. The laser also shows that the Moon is moving away from us at 3·8cm a year and is three cricket pitches farther away than at the first Easter two millennia ago. At that rate, the last blue Moon (in the sense of two full Moons within 31 of our modern days) will come in a couple of billion years as the lunar cycle slows.

In 15 billion years, Easter will always be on the same date, because the Moon will by then be fixed at a single spot in the sky. In less than half that time, though, the Apocalypse will have arrived, as the Sun expands and consumes all life.

● *Steve Jones is professor of genetics at University College London*

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(Filed: 18/04/2006)

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Familar form: letters have been shaped by everyday sights such a the crescent moon

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