Where We Started....
Most significant events of the millennium
OF ALL THE millennium’s technological revolutions, the most far-reaching started just before the era’s midpoint. Throughout history, the ability to read and write had been confined mostly to tiny suites of nobles, priests and scribes. But in the 15th century a literate middle class arose in Europe. Its hunger for knowledge led inventors to seek a way to mass-produce the written word. And when German goldsmith Johann Gutenberg succeeded—creating his masterpiece, a run of 100 gorgeously typeset Bibles, in 1455—he unleashed an information epidemic that rages to this day.

To appreciate Gutenberg’s achievement, it is necessary to understand what he did not do. He didn’t invent printing. The craft emerged in 8th century China using multiple characters carved on a single woodblock. He didn’t invent movable type (letters rearranged for each new page): Chinese printer Pi Sheng did, around 1040. Gutenberg didn’t ever invent movable metal type. The Koreans did, in the 14th century. But wood-block printing of text reached
**What's in a Name?**

**Scientific classification schemes don't usually make children cry, but I know at least one 5-year-old who was in tears when he heard that Pluto had been struck from the list of true planets. In any science, as fields advance, definitions must be reconsidered, however difficult it is for people to readjust.**

Children aren't alone in feeling strongly about Pluto's status. Last June, after the International Astronomical Union announced that it would redefine the word planet, a group of adults formed the Society for the Preservation of Pluto as a Planet. Feelings ran high among astronomers too. A panel proposed a definition on Aug. 16 that would have kept Pluto as a planet (SN: 8/23/06, p. 115), but astronomers attending the union's meeting voted overwhelmingly on Aug. 24 to add a size criterion that relegated Pluto to a less prestigious category: dwarf planet (SN: 9/2/06, p. 149).

Another controversy in 2006 hinged on definition. Time as recorded by the astoundingly accurate atomic clocks doesn't stay in sync with time measured by Earth's rotation. So, what's a year? Timekeepers argue that both measures are useful but haven't agreed when to add leap seconds to make the planetary and the atomic clock years match up (SN: 4/22/06, p. 248).

The boundaries of the category Homo sapiens also received scientific attention this year. A report challenged the 2004 announcement that a fossil find on an Indonesian island represents a new species of tiny relatives of humanity, arguing that the partial skeleton came from an early person with a growth disorder. Some anthropologists adamantly disagreed or noted that it's difficult to delineate who's who among fossil species (SN: 1/19/06, p. 320).

Strong opinions also clashed over whether ants leading nest mates to food warranted the word teaching (SN: 1/14/06, p. 20). And zoologists raised the possibility that birds, like scientists, may debate a word's meaning. A recent report says that chickens use a "tch, tch, tch" to announce a nutritious find, such as corn kernels (SN: 11/16/06, p. 352). Perhaps next year researchers will detect behaviors suggesting that one bird asks another, "You call that food?"

—Jolie Ann Miller, Editor in Chief

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**Anthropology & Archaeology**

**Mini debate** Anthropologists clashed over a report that a partial skeleton initially attributed to a new, tiny species of human cousins actually comes from a pygmy Homo sapiens with a developmental disorder (170: 330).

**Ancient genes** New techniques enabled scientists to extract an unprecedented amount of DNA from a Neandertal fossil, ushering in a new era of Neandertal genomics (170: 329).

**Exploration of an ancient, dried-up lakeshore in Australia revealed the largest known collection of Stone Age footprints, made roughly 60,000 years ago (169: 3-4).**

**Mix it up** Genetic analyses suggested that human and chimpanzee ancestors interbred before going their separate evolutionary ways no more than 6.3 million years ago (169: 308).
Astronomy

Doggone After a rancorous debate, planetary scientists voted to demote Pluto, leading the solar system with only eight planets (170: 115, 149). Another object that’s larger than Pluto and was once touted as the tenth planet at the fringes of the solar system was reclassified as an ice comet. Largely, this is because the definition of planet was restructured (170: 277).

Delayed onsets The next solar-activity cycle won’t begin until late 2008, a year later than the sun’s standard cycle would forecast, a new computer model predicted (170: 149).

Galactic cannibalism A highly elongated group of stars was revealed to be a dwarf galaxy that the Milky Way is gobbling up (169: 78). About 13 billion years after its birth, our galaxy is still picking on the stars (170: 13).

Radio daze Astronomers discovered what appears to be a new class of radio wave-emitting stars (169: 59).

Stellar performance Measuring radioactive material spewed by dying stars, astronomers calculated the star-formation rate in our galaxy over the past few million years (169: 6).

Gravitational lens A gravity wave of cosmogenic material, phenomenon created when the gravity of a massive galaxy bends and magnifies the light from a background object (169: 27).

Titanic findings The shattered surface of Saturn’s moon Titan revealed dunes like those in the Arabian Desert (168: 338). Radar images strongly suggested that the moon holds lakes of liquid hydrocarbons (170: 83) and a combination of radar and

Growth up fast When the universe was only one-fifth its current age, a remote galaxy had already begun to look like the modern Milky Way (170: 107).

EYE ON SATURN The Cassini spacecraft captured an image of the most powerful storm ever seen on Saturn (169: 174). New evidence indicated that a shattered moon produced the planet’s main rings (169: 174). With the sun positioned behind Saturn, Cassini discovered two new rings and confirmed the presence of two rings (170: 263).
At a prehistoric farming village in Pakistan, researchers discovered the oldest known examples of dental work, 11 teeth with drilled holes dating to between 9,000 and 7,500 years ago (169: 213*).
Did you have a cavity as a child?
Focus of Dentistry Shifts

- Treatment of Results of Dental Disease
- Prevention of Dental Disease
- Reduced Risk Factors
Early Childhood Oral Health

JOEL H. BERG AND REBECCA L. SLAYTON

WILEY-BLACKWELL
MATERIALS CONTINUUM

GIC  RMGI  COMPOMER  COMPOSITE

Wednesday October 20, 2010  Symposium on ECC in American Indian and Alaska Native Children
Physico-Chemical Bond
Adhesive Required?
Coefficient of Thermal Expansion

- Enamel: 15-20 ppm/°C
- Dentin: 10 ppm/°C
- GIC: 8 - 12 ppm/°C
- Amalgam: 25 - 35 ppm/°C
- Composite: 28 ppm/°C
Glass Ionomers Contain Valuable Fluoride Ions Which Are Released to the Adjacent Tooth Structure

Protection against secondary caries!

Wednesday October 20, 2010
Symposium on ECC in American Indian and Alaska Native Children
Glass Ionomer as a Sealant

Indications

• Difficult to isolate/etch tooth
• “Transitional” sealant in young child
• Very deep, non-caries grooves
GI development – where is it going?

- Improved properties
- Better esthetics?
- Improved handling and delivery
- More research! – particularly in further elucidation of ion exchange mechanism and chemical adhesion
Marketing Promotion

The diagram illustrates the overlap between narcissism, ADHD, and stalking in the context of marketing promotion. The names of social media platforms like MySpace, Facebook, Twitter, and Foursquare are placed within the intersections of these categories.