SCIENCE

Notebook

Babies older than 3 months who are uncontrollably without reason are at great risk of suffering from lower IQ, hyperactivity and discipline problems. In adulthood, new research has found.

Persistent crying for periods longer than two weeks after that age may suggest subtle neurological problems that are later responsible for developmental deficits, said federal government researchers who published a study last week.

Persistent and unexplained crying when babies are younger than 3 months — commonly known as colic — was not associated with cognitive problems later on.

"Children who had prolonged crying, but not those who had colic, had poorer outcomes on many of the tests of cognitive development," the researchers wrote in a paper published in the Archives of Disease in Childhood.

The study was based on 327 children in Linköping and Sweden who were evaluated at 6 and 13 weeks and had their IQs measured when they were 5 years old. While the study was small, the researchers said the stark differences between the groups strengthened their confidence in the results.

The researchers found no obvious differences to explain the prolonged crying in babies older than 3 months. While colic-related crying appears to be associated with prolonged crying after babies are older than 3 months.

— Shankar Vasan

An international team of astronomers has found what appears to be the remnant of an enormous 16-hour-voyage galactic explosion famously observed by the Danish astronomer Tycho Brahe — a discovery that helps to clear up the nature of such rare eruptions.

On Nov. 11, 1572, Brahe noticed a bright new star in the constellation Cassiopeia. His observation helped overturn Aristotle's longstanding claim that the heavens are immutable. And some scholars have suggested that it may also have inspired the portentous dialogue about a bright star in the opening scene of "Hamlet."

All Shakespeare was 8 years old when Europe was besieged with news of Brahe's observation.

Scientists today know that what Brahe saw was a Type Ia supernova. Such an explosion, which throws off as much light as a billion of our suns, occurs when an aging white dwarf star, the kind our own sun is destined to become, absorbs huge amounts of matter and energy from a nearby companion star and blasts apart as a result of the ensuing instability.

Still unresolved, however, has been the question of what kind of star white dwarf pairs from.

In the Oct. 28 issue of the Journal Nature, scientists from Europe and the United States, who have been searching the region of the Milky Way where the explosion is believed to have occurred, report finding what appears to be the remains of that cataclysmic star. The remnant is moving at more than three times the average speed of other stars in the region, as predicted for something as heavy as that blast. If the hypothesis is correct, it was an otherwise white dwarf that was absorbed to cause the explosion, so that reaction should result in no leftovers. It also shows that the rematerialized star in that cataclysmic event does not hold a red giant — a possibility some had suggested — but rather an ordinary star very much like our sun.

— Rich Weiss

Scientists are developing technology that would turn raw sewage into an energy source, according to a report being published today in the American Chemical Society journal Environmental Science & Technology.

Researchers at Pennsylvania State University have tested a microbial fuel cell, similar to a hydrogen fuel cell, that captures electrons naturally released by bacteria as they digest organic material and converts them into electric current, instead of having it oxidize. So far, scientists have generated 767 microwatts per square meter by converting biodegradable wastewater, said Hrishikesh Logan, Penn State's Kappe Professor of Environmental Engineering.

While 767 microwatts is not a lot of electricity — common light bulbs use 100 watts of energy, for example — Logan said he envisioned a system in which wastewater treatment plants would power themselves with this technology. Wastewater treatment now consumes 5 percent of American energy production, he added.

Wastewater from 100,000 people could yield 0.3 megawatts at 767 microwatts, he said, enough to power 1,400 homes.

"We're looking to harness the energy, Logan said.

— John Atchison