



SCI•TECH

SUNDAY, FEBRUARY 13, 2005 • (ALL)

NORTH COUNTY TIMES F-8

OUT HERE

Take Einstein with a grain of sand

2005 is the centennial anniversary of Albert Einstein's miraculous year.

If you follow news in science, you will hear much this year about what Einstein accomplished in 1905, and about how the great man changed the way that scientists think about the universe.

You will learn, no doubt, about special relativity and the photoelectric effect. And although they have little connection to 1905, there will be the usual myths about Einstein as a lackluster student and recollections about his later years as the world's leading humanist-genius.

I won't be paying much attention.

Not that I dislike Einstein or think his life and work uninteresting. Not at all. I am sure that he was most of what his mythmakers say he was.

It's simply that Einstein earned his fame by showing that there is a kind of bland sameness to everything in the universe and for all time.

He wasn't the first to do so. There was Isaac Newton, of course, whose notion of absolute space and time was demolished in order to make way for Einstein's relativity. Newton's universe was unpalatably bland. Einstein spiced it up quite a

bit. "Kicked it up a notch," as a well-known TV chef likes to say.

Bam!

I'm still not enthusiastic. What excites me most are the discoveries in science of conditions and entities that existed in particular places and for finite periods of time.

If you could identify a single crystal in a rock from the mountains to our east, for instance, and tell its life history, you would discover that it formed within a cooling magma chamber far below the surface of the Earth.

Time, uplift and erosion have brought the small crystal to the surface. More time and erosion will break it free of the rock where it formed. Perhaps it will be carried to the sea by runoff from a succession of rainstorms over hundreds of years, until it rests in a bed of sand grains that will form new rocks.

For a few months or a few years, the little grain — now sand — might help to make up a beach much like Moonlight Beach in Encinitas. But that beach will probably be unrecognizable to the surfers who enjoy Moonlight Beach today, and Encinitas will be

► HINELINE, F-3



MARK HINELINE

step by step



Professor, students study the fossil footprints of Mojave Desert dinosaurs

RUTH MARVIN WEBSTER FOR THE NORTH COUNTY TIMES

In a remote northeastern corner of the Mojave Desert lie slabs of sandstone embedded with the footprints of dinosaurs that walked there some 200 million years ago. Dating from the Jurassic period, they are the only known dinosaur tracks in California.

Alan Trujillo, associate professor and chairman of the Earth Sciences department at Palomar College in San Marcos, has traveled to the Mojave Desert many times to photograph, trace and measure the footprints since he and his students first discovered the prints in 1992.

"We saw that it said 'dinosaur tracks' on the very detailed Bureau of Land Management map, but when we asked Steven Spear (also an Earth Science professor at Palomar College) about them, he said that he had never seen them. So we thought maybe it was just legend."

The group decided to spread out to best search the high desert terrain that "was definitely a four-wheel drive kind of place," Trujillo said. "I told the students to look for tracks about the size of a dog; I was just guessing."

And before too long, one of the students found trackways — the term for a sequence of footprints — in the Aztec sandstone. They turned out to belong to about eight species of dinosaurs that roamed the region when it was coastal sand dunes.

The time period of the tracks is determined by the age of the surrounding sedimentary rock.

"Sand buried into the depressions left by their feet; they were covered and hardened into the rock," Trujillo explained. "After that, they were uplifted by thrust faults and only recently exposed. It is (a mineral-rich area.)" Flagstone quarries and extensive mining operations are located nearby.

The footprints are believed to be those



COURTESY PHOTOS

Above, Al Trujillo is pictured with bipedal coelurosaur trackways in Piute Valley in the Mojave Desert. Top, using a hammer for scale, the photo of the Aztec sandstone shows early quadruped (species unknown) trackways in the same area.

► STEP, F-7

THE GAME COUNSELOR

Personalizing your video game system

During the past year, I have been introduced to a couple of Web sites that have



NIMO RIVERA

opened my eyes to a new trend. Usually, I don't do trends. I try to set myself apart from everyone else. One of the ways I do this is to decorate my systems a certain way so that if you look at them, you know that they belong to me. I am a red guy. I have always loved red. Naturally, that's the color that goes on my boxes. I have my Xbox decked out in red chrome stickers. Where the power button light is normally green, mine is red. I even



DON BOOMER / STAFF PHOTOGRAPHER A personalized Xbox system.

made a controller that is red. My Xbox jewel in the center of the console has been covered by a rather engaging vinyl label.

These stickers don't just come in one type. You can get different textures and graphics on the stickers. The great thing about the stickers is that they won't void the warranty of your console if it still applies. If you have to send it in for repairs, the stickers

► RIVERA, F-7

SKIES ABOVE

It's astronomy, not astrology



MARK RITTER

Astronomy is like any other discipline, one with its own unique language and special heroes. And like the other disciplines, many of these words and names get twisted about or misunderstood or are just plain hard to say. Here are a few of the many examples I've picked up over years of teaching this divine discipline.

The term "astronomy" itself is one that is often misunderstood.

When telling someone that I teach astronomy I often get a response that goes something like, "Oh, and what sign are you?" or "Do you know how to do horoscopes?" I have to explain then, in the nicest way of course, that what I teach is the science of astronomy, the study of the heavens, not astrology, its pseudoscientific etymological cousin.

► RITTER, F-7



Bradley J. Fikes will return next week.

Groundbreaking for new Science Research Park to be held Thursday

RUTH MARVIN WEBSTER FOR THE NORTH COUNTY TIMES

Officials from UC San Diego and the La Jolla Institute for Allergy and Immunology, as well as executives from the biopharmaceutical company Gemini Science Inc., will be on hand this week to commemorate the start of construction on the first building in the university's new Science Research Park.

Private groundbreaking ceremonies will be held Thursday at the site located on the eastern perimeter of the campus, between the new Rebecca and John Moores UCSD Cancer Center and Regents Road.

Organizers say the project signals a new era of scientific collaboration between the university and outside re-



COURTESY IMAGE

An artist's rendering of UC San Diego's new Science Research Park. Private groundbreaking ceremonies for the first building are scheduled to be held Thursday.

search institutions. Building will begin on a vacant 30-acre site originally

ceded to the university by the federal government with the stipulation that outside enti-

ties or tenants must augment the mission of the university — namely teaching, research

and service.

"But the land lay fallow for quite awhile and was not activated until just recently," said Dr. Gordon Gill, a professor of medicine at UCSD who was instrumental in realizing the park's construction.

The Science Research Park's first tenants will be the institute and its industrial partner, Gemini Science Inc. Mitchell Kronenberg, the institute's president and scientific director, is very enthusiastic about the move that will finally bring all of the institute's researchers under one roof.

"We are currently at 45,000 square feet," Kronenberg said. "Our house is so small, even the mice were stepping on each other. We need to move so that we can grow."

The new building will be a state-of-the-art, 145,000-square-foot facility in keep-

ing with the style and design of other university buildings. It is one of five potential two- to four-story buildings to be built on the site.

"The footprint is large enough to have four to five entities in the park," said Dr. Edward Holmes, vice chancellor of health sciences and dean of the university's School of Medicine. "They need not all be biomedical companies; information technology or engineering firms might be a good fit, too."

The university wasn't interested in just making a real estate deal, but wanted to bring in a group that enhanced the academic environment, said Kronenberg, who noted that a number of the institute's scientists hold adjunct teaching positions at

► PARK, F-7



COMPUTER TUTOR

Graphics programs have quirks

Regarding some graphics programs I recently mentioned, Marie Anne Lorenzini wrote to say she couldn't find a way to lighten a photo's background in Irfanview, and Al Roller said the "red-eye correction" feature in Picasa2 doesn't work properly. Well, all graphics programs have certain strengths and weaknesses. Irfanview, as its name suggests, is mainly an image "viewer," while Picasa2 is mainly an "image organization tool."



DON EDRINGTON

Neither program has extensive bitmap-editing features, such as those found in, say, PhotoShop Elements, a very full-featured image-editing program. In PSE the "red-eye correction" tool does its job with extreme precision, while its "dodge" and "burn" tools allow you to lighten and darken selected areas of a photo.

There is no way I can give a detailed tutorial on PSE, but I can offer some tips to get you going. Let's start with the "clone" tool, which copies one area of an image into a different area. Here's an example:

Let's say you have a snap-

shot of two children wrestling on a park's lawn. However, a third child appears behind them, and you just want to see your two in the picture. Let's further assume that grass is the main background seen in the shot.

With your clone tool you simply press ALT and click on an open area of grass. Next, "clone" some of the grassy area over the third person until he disappears. If this sounds complicated, you will be surprised to learn how easy it actually is. All comprehensive image-editors, such as Adobe PhotoShop, Corel PhotoPaint, and Paint Shop Pro, have a clone tool. I'll give more photo-editing tips in the future.

Last month I explained how to copy Outlook Express files onto a separate disc for backing-up and/or moving to a new PC. However, the fact that all OE files and folders are compressed into ".DBX" files seems to confuse a lot of folks. Here's another method that may be less confusing:

Right-click your Desktop, choose New>Folder and name it "Inbox." Repeat this procedure for each of

the folders in Outlook Express. Now get into your main "Outlook Express" folder, whereupon you can drag all your messages from their individual folders into the new ones you just created. Finally, just drag these folders onto your other media (with a flash memory "thumb" drive being the quickest and easiest device to use).

The individual messages can then be dragged from the disc into the corresponding folders on a new computer.

If you can't locate your Outlook Express folder, go to Run>Search/Find>Files & Folders and type in: Outlook Express. You'll see that it's nested deep within a collection of folders with very cryptic names. If you would like quicker access to it in the future, right-click it and choose Send To>Desktop (Create Shortcut).

You can also choose a new location for this folder from within OE by going to Tools>Options>Maintenance and clicking on "Store Folder." In the dialogue box that appears, type in a new location, such as, say, c:\Outlook Express.

More tips can be found at www.pcdon.com and calls are welcome at (949) 646-8615.

RITTER

Continued from F-8

When I tell my class that the next chapter we'll be looking at is about cosmology, there is always the one well-meaning, if not well-read, student who exclaims something like, "What do make-up and lipstick got to do with stars?" Once I come to, I explain — in the nicest way, of course — that cosmology is the study of the entire universe from birth to impending death. It is not cosmetology, the study of cosmetics and their many interesting uses.

There are plenty of candy references I get to put up with, too. Besides the obvious planetary namesake that is the Mars bar, which recently went down the Street of Discontinued Candies — but which you can still get on eBay! — there is the astronomically christened Milky Way bar.

Recently it has been discovered that our galaxy, the real Milky Way, has a bar-shaped thicket of stars through its center. Our home is classified as a "barred spiral galaxy." But don't make the mistake of asking what the bar in the Milky Way is made of unless you want to

hear the quirky answer, "Fluffy milk chocolate?" followed by some goofy laughter.

And, yes, there really is a type of cosmic phenomenon called a Starburst. And no, it is not composed of a multi-colored assortment of chewy fruit-flavored candy. It is a place of intense starbirth that can light up entire areas of galaxies.

Then there is the stockpile of singular names of astronomers past and present. I can lose a class for a couple minutes by just mentioning or trying to pronounce some of these names.

For example, Annie Jump Cannon is not a complete and ungrammatical sentence about a woman leaping over a large cylindrical weapon. It is the real name of a very famous pioneering woman astronomer who was first to classify stars — over a half-million of them — back in the early 20th century.

Other tongue-twisting top liners are Tycho Brahe, the great pretelescopic Danish observer; Karl Schwarzschild, a pioneer in the field of black holes; the extraordinarily eccentric Fritz Zwicky out of Caltech, one of the first astronomers to consider the now vital tool of gravitational lensing; Enjar Hertzprung, another Danish astronomer who, with another

astronomer by the relatively lackluster name of Henry Russell, gave us the most famous star diagram in astronomy.

In my opinion, though, the king of all names unique, and the moniker that offers a great chance for me to embarrass myself in front of my class, belongs to Subrahmanyan Chandrasekhar. He was the world-class astronomer who helped define the mass limits of dead stars called white dwarfs. Mercifully for me, everyone called him Chandra for short. The Chandra X-ray Observatory, a cutting-edge tool for discovering the invisible universe, was named for him.

And, of course, even astronomy has its share of wordplay in the form of off-color double entendres. But I won't foul this column with any of them except to ask you — in the nicest way, of course — to pronounce the seventh planet out, Uranus, with the accent on the first syllable, something like "YOUR-un-us." If we all pronounced it that way, astronomy instructors could trade in hours of snickers for quality learning time.

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RIVERA

Continued from F-8

don't even have to be removed.

The amazing thing about these stickers is the variety. There are the chrome colors, which are available in huge numbers. I have a friend who got two different sets and mixed them together. He used chrome purple and chrome gold to make a great mix. It looks very sharp.

I am a huge proponent of leaving factory stuff the way it is. However, this was something I couldn't pass up. I even decorated my controllers with chrome stickers. I gave my red controller a nice chrome silver accent while my blue one got the red treatment. This is a great site to visit, and consoles aren't the only thing you can decorate.

The site to visit that I decorate with is DecalGirl.com. If you want to decorate your systems without doing much work, check them out.

I have never had a problem with my product or the customer service. They are phenomenal and when I pick up my new systems, I'll make sure I give them a visit as soon as I can.

The other site that I visit is customxbox.net. I really like this site, but the warranty problem exists. Most of the modifications from this site are internal. Some modifications can be made without hurting the hardware and processor inside.

The parts that you can purchase from this site range from neon lighting to colored parts for your console and controllers. As there are only three different colors for controllers, you have more color options. You also can acquire

different color options for your actual console's outer shell.

Adding to the outer shell is also possible. You can add lighting to your controller ports or purchase a different jewel for the center of your X-Box. Making changes from this site can be simple or can take a lot of work. Be sure you want to make the changes permanent. These modifications will void your system's warranty. I suggest waiting until your warranty has ended before you make these modifications.

In all honesty, I can't tell anyone what to do with their consoles, but whatever work you put into it, will be worth it. I know that I love the way my consoles stand out. Will you?

Nimensio "Nimo" Rivera, a former Marine who resides in Fallbrook, plays at home and hosts a weekly gaming gathering.

and research in the field of immunology and attract the best and brightest of the country's graduate students.

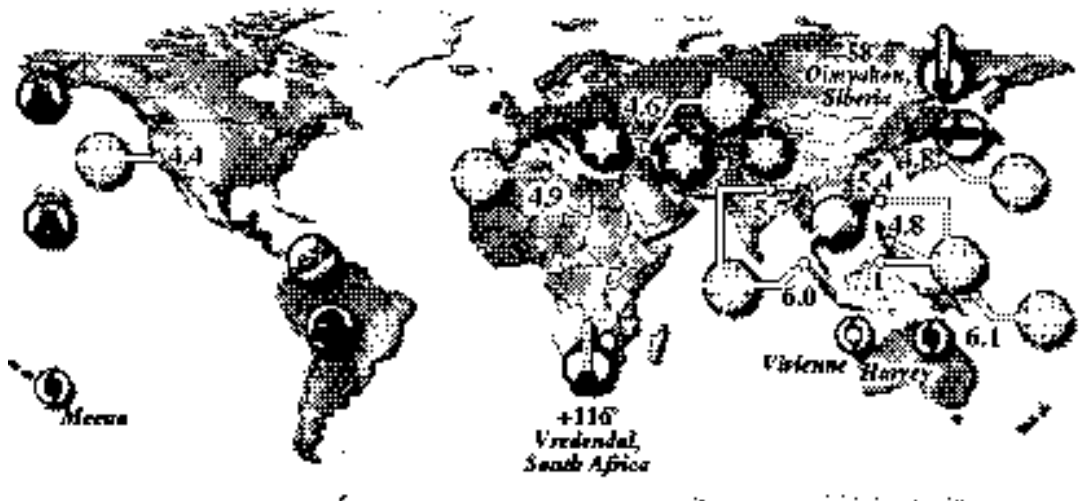
"This sort of collaboration between the private and public sector may lead to some exciting advances," Holmes said. "A stone's throw from the new Cancer Center, you have to think it could lead to a more rapid translation of basic scientific discoveries into new treatments and cures. We are in the midst of exciting times.

With UCSD, the Salk, the Burnham Institute and LIAI, as well as pharmaceutical giants such as Pfizer and Novartis all right here, we really do have a huge opportunity to make advances in human health."

"Bringing LIAI as the first tenant really sets the gold standard for the others to come," Gill said. "Even before there is a hole in the ground, the project has already been a success."

Earthweek: A Diary of the Planet

By Steve Newman



Week Ending February 11, 2005

Ice Victims

An abrupt change in sea conditions appears responsible for the death of 11 killer whales that became trapped between ice floes and concrete blocks along the coast of Japan's Hokkaido Island. One of the orcas managed to break free into open water, but wildlife experts said she appeared weak and unable to move very well due to the ordeal. An environmentalist in the town of Rausu, where the whales became trapped, said rescue attempts were hampered by the ice clusters, and by the water being too shallow to allow boats to reach the victims.

Euro-Asian Blizzards

Winter storms across Eastern Europe and southern Asia brought heavy rain, blizzards and even welcome relief to drought-ravaged parching parts of the region. Snowfall and avalanches in Kashmir trapped thousands of motorists, prompting Indian officials to send in troops to clear the highways. Chinese officials said nearly 4,600 head of cattle froze to death after a sudden snowstorm hit southwestern Tibet. Bitter cold and blizzard conditions were also responsible for numerous deaths from Hungary and the Balkans to northern Iran.

Volcanoes

One of the latest and most active volcanoes in Alaska spewed hot rocks and lava that were visible to residents of the Alaska Peninsula more than 20 miles away. Volcanologists said the volcano was no building to a more powerful eruption. Two streams of lava from Hawaii's Kilauea Volcano began entering the ocean on the southern shore of the Big Island.

Bird Flu Update

Vietnamese officials say the country's latest outbreak of avian influenza shows signs of abating, and they hope to have it under control by the end of February. But U.N. Food and Agriculture Organization representative Anton Rychener believes the virus is not likely to be eradicated. "What is happening this year is not an outbreak. It is an endemic recurrence of a disease that is here to stay," said Rychener. China's agriculture ministry said its scientists have developed a new vaccine that can effectively "outpace" the transmission chain of avian influenza among waterfowl. The China Daily reported that test show the vaccine enables ducks and geese to fight H5N1, the highly lethal strain of bird flu, three weeks after being vaccinated.

South American Slides

Days of torrential rainfall in Venezuela and parts of neighboring Colombia unleashed flooding and mudslides that demolished buildings, washed out roads and forced tens of thousands of people from their homes. One of the most deadly mudslides killed five members of a single family when their home was buried in the Venezuelan coastal town of Puerto Cabello. A state of emergency was declared in several areas.

Earthquakes

A powerful aftershock of the disastrous Dec. 26 tsunami off Sumatra caused people to flee their homes in panic. Feeding another tsunami, some traveled more than a mile inland following the shaking. A sharp quake off the southern Philippines caused similar panic on Borneo. Malaysia issued its first-ever

tsunami alert following the magnitude 7.1 tremor, which produced no ocean wave.

Earth movements were also felt in the central Philippines, Papua New Guinea's New Ireland region, Taiwan, northern Iran, Nepal, eastern Nepal, northern Tunisia, the Turkey-Iraq border region and southern parts of the San Francisco Bay Area.

Tropical Cyclones

The outer bands of Cyclone Meena brought down trees, cut power and caused minor damage in the Cook Islands, but there were no reports of injuries.

Cyclone Harvey caused flash flooding and wind damage when it struck a remote area of northern Australia, along the border of Queensland and the Northern Territory.

Weak Cyclone Vivienne formed briefly off northern Australia.

Singing Monkey

Scientists exploring the rain forests of Bolivia say they have discovered a new monkey sub-species that can be heard singing in a remote part of the country's Madidi National Park. The primate is orange-brown in color with a golden crown, and stands less than 2 feet in height. Discoverers Robert Wallace and Humberto Gomez of the Wildlife Conservation Society said they had observed couples singing and hugging each other in the early morning as if they were human. The society plans to have the new monkey's name chosen by the highest bidder in an Internet auction at charityforbirds.com to raise funds to preserve the animals' habitat.

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STEP

Continued from F-8

of three bipedal (two-legged) coelurosaurs and about six quadrupeds (four-legged animals).

"The quadrupeds are probably mammal-like reptiles — not dinosaurs," said Robert E. Reynolds, a paleontologist at LSA Associates in Riverside, who has studied the trackways. "One resembles the tracks of a desert lizard."

Also found in the area are trails and tracks of invertebrates — probably worms and tarantulas — from the same period.

In some ways, the footprints pose more questions than offer answers.

"Every time we go there, we find new questions," Reynolds said. "What is different from finding fossil bones is that these trackways show what the animal was actually doing at the time. And since no fossil skeletons have been found in the Mojave, much of the information we have about them must be surmised from only the footprints, and there is much educated guessing involved."

"A number of dinosaur skeletons have been found in Orange and San Diego counties, but they are primarily from the Cretaceous period," Reynolds said. "These are one of the few (trace) fossils from the earlier Jurassic period."

Researchers use the length and width of fossil footprints to estimate the dinosaur's size, including leg length, posture, gate, foot structure and in some cases, even social behavior. The spacing of the prints also reveals whether the animal was walking along or running and at what speed they may have traveled.

Indeed, the top speed for the most famous bipedal dinosaur of all, the tyrannosaurus rex, has been the subject of discussion in paleontological circles. Scientists from UC Berkeley reported a couple of years ago that rather than traveling at the speed of a car, as they did in the movie "Jurassic Park," T

What are trace fossils?

Fossils can be divided into two general groups — body fossils and trace fossils. Body fossils are the preserved anatomical parts of the plant or animal and provide direct evidence, while trace fossils are produced by the animal's activities. A trace fossil, therefore, is indirect evidence of an ancient life and provides information on the behavior of the organism. There are many different types of trace fossils. Dinosaur tracks and trackways are perhaps the best known. Often, animals' burrows become filled with sediments and are preserved. Nest structures are another type of trace fossil. Evidence of feeding can be preserved as trace fossils, such as insects chewing on leaves. Tooth marks on bones may be left by a predator while feeding on its prey or by rodents chewing on bones for the minerals. Eggs, gizzard stones and dung are also considered trace fossils. The study of trace fossils is called ichnology.

—Park Paleontology, published by the Geological Resources Division of the National Park Service, summer 2002

Rex's maximum speed based on trackways was probably closer to 27 mph.

"That's still faster than Olympic sprint champions," Trujillo said, "and like a sprinter, they probably didn't sustain that speed for long, either."

Of course, how energetic dinosaurs were also is a matter of debate. "If they were warm-blooded, like birds, then they may have been more active," he said.

Of the 116 tracks found in

the Mojave, the two-legged tracks are thought to be made by coelurosaurs. And since those are distinguished by only their footprints, two have been assigned the ichnogenera "anchisauripus" and "arallator." The third remains unnamed. "When the animal did not die in its tracks," Reynolds said, "we give them the ichnogenera, which means 'footprint group.'"

Researchers have compared the dimensions of the feet to coelurosaur skeletons found in other Western states. Coelurosaurs had three toes and claws and probably ate a variety of things, including vegetation and meat. "Their teeth are for catching animals," said Reynolds, who added that their footprints are 4 to 6 inches in length and the stride is about 3 feet. "We think they were ostrich size and may have run quite rapidly," he said.

The gallator's footprint is notably asymmetrical. Trujillo has estimated its leg length at 3 feet — about the size of a human — and its speed (based on left and right stride of the prints) to be about 3.6 mph. "That's about half our walking speed, because walking 3 miles an hour is a good clip for most people," he said.

Though the trackways in the Mojave have not been preserved per se, the Bureau of Land Management regularly patrols the area containing where they have been found. They have also been inventoried and studied, and replicas have been made of the prints by Reynolds and Ted Weasma, a geologist with the Mojave National Preserve in Barstow.

For Trujillo, though, learning more about the dinosaurs and their trackways is just a hobby. His real work, he says, is writing oceanography textbooks and teaching at Palomar full time, but he certainly understands the mystique dinosaurs hold for modern man.

"Finding the dinosaur trackways was really exciting," he said, smiling with enthusiasm. "Walking in the same footprints of a dinosaur? It is very cool."