Briefings

edited by MARK H. CRAWFORD

Turnaround in Medical Enrollments

A 15-year decline in numbers of people applying to medical school appears to have bottomed out, according to the Association of American Medical Colleges (AAMC). The turnaround reflects increased numbers of women and minorities planning to enter medicine.

This fall, 29,915 people applied to medical school, compared with 26,721 in 1988. The AAMC says applicants peaked in 1974, a phenomenon associated with deferred draft status, when there were two applicants for every opening. Now there are 1.6 applicants per position.

The most recent figures show a 2.7% increase in the number of women applicants, who composed 38% of the 1989 entering class. There has been a 5.3% increase in black, Puerto Rican, Chicano, and American Indian applicants and a 9.3% increase for Asians. Applications from white males have decreased by 2.6%.

The Abnormally Normal Quasar

Shortly after the Big Bang—if a billion years can be called short—there existed a galaxy whose core contained a quasar: one of those ferociously bright energy sources that typically outshines its home galaxy by a factor of at least 1000.

As quasars go it was quite ordinary. But when its light reached Palomar Mountain on Earth some 14 billion years later, it quickly went on record as PC 1158+4635, the most distant object yet seen by humans—and in some ways, the most baffling.

The problem is that aside from its distance this appears to be an utterly normal quasar, say its discoverers—astronomers Maarten Schmidt of Caltech, James Gunn of Princeton, and Donald Schneider of the Institute for Advanced Study. Its spectrum looks just like that of other known quasars, even though its redshift of 4.73 puts it much farther away than they are and thus much closer to the Big Bang. (The previous champion had redshift 4.43.)

But being close to the Big Bang and appearing normal at the same time suggests that both this quasar and its surrounding galaxy must have formed very rapidly on a cosmic time scale—far faster than current theories can account for. Cosmologists are hard-pressed to explain it—particularly when the galaxy also has to bring forth a billion-solar-mass black hole, the engine that gives a quasar its power.

So the theorists have their work cut out for them. A flood of papers is already in preparation. Stay tuned.

Congress to Extend R&D Tax Credits

Industry has won a round in the fight to extend federal tax credits covering research that companies fund in their own labs and at universities. But the battle is far from over, because Congress has extended the credits for only 12 months.

After sending signals earlier this fall that the 20% credits would be made permanent, the House Ways and Means Committee and the Senate Finance Committee decided to continue them only for one more year and to chop the credit to 15%—75% of its previous value. They were originally due to expire on 31 December 1989. The actions came as part of an overall compromise to bring the 1990 budget into compliance with targets imposed under the Gramm-Rudman-Hollings deficit reduction law.

For industry and the higher education lobby the decisions are both a blessing and a curse. While the tax credits are kept alive, U.S. companies continue to face an uncertain tax climate as they make decisions about future research investments. As for the lobbyists, they get to mount their fourth campaign on the R&D tax credits since 1981.

New Age Nobelists

Picture this: before you lies an article by David Baltimore telling laymen "how far molecular biology has come in unraveling the mystery of cancer." Just a few pages earlier, particle physicist Sheldon Glashow has recounted for the great unwashed the progress that's been made in discovering "at the very heart of the atom, the secret of the structure of the cosmos."

But mixed among these stirring pages are revelations of another kind: the paths to genius, wealth, and happiness.

Take "the brain Supercharger/Subliminal Mindscripting System." For $49.95, and in only 28 minutes, it will "zap stress, boost your brainpower, and unleash awesome creative and intuitive powers." And here's a bonus: it "turns fat people thin and office clerks into mental millionaires."

Then there's the page advertising Scientology. That's the body of thought that teaches us that "there are no concerns which cannot be resolved by reason alone." Indeed, Scientology, the page boasts, can "help anyone towards greater ability, knowledge and communication . . . and happiness."

And how about this: "One million dollars in 9 months guaranteed" if you read a $12.95 book, *The Royal Road to Riches*.

What are we looking at? Not a sci-fi magazine; not even glossy *Omni*, put out by the publishers of *Penthouse*. No, the periodical before us is *Discover*, the last remaining of the lay science magazines launched in the '80s, and the same magazine that Pac-manned AAAS's own *Science 86* only to sell itself to Family Media, owner of a stable of magazines catering to upwardly mobile members of the me generation.

The unlikely combination of fact and pitchmanship appears in *Discover's* October issue—a special issue dubbed "A Decade in Science" and touted by the editor as "our most ambitious issue to date."

With authors like Stephen Jay Gould, Bob Gallo, and Marvin Minsky, as well as Baltimore and Glashow, he's surely right. But what are we to make of the ad contents? Some choices:

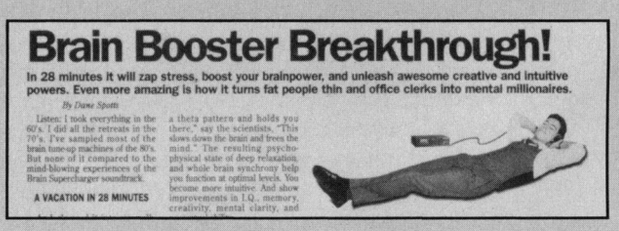
1) A sad commentary on the failure of lay science publications to convince Madison Avenue that lay science readers are bright, well-heeled, and generally desirable folks.

2) A sad commentary on Family Media's advertising department, the publisher's standards, and/or the owner's greed.

3) A sad commentary on the willingness of top scientists to get their names in print no matter what the setting.

4) A sad commentary on our society and its fin de siecle lust for "New Age" weirdness.

5) A heartening reflection of the triumph of the human spirit which despite cruel financial obstacles manages to get important information to science-hungry minds.


Brain Booster Breakthrough!

In 28 minutes it will zap stress, boost your brainpower, and unleash awesome creative and intuitive powers. Even more amazing is how it turns fat people thin and office clerks into mental millionaires.

By Diane Sputt

Listen: I took everything in the 60's. I did all the retreats in the 70's. I've sampled most of the brain tune-up machines of the 80's. But none of it compared to the mind-blowing experiences of the Brain Supercharger soundtrack.

A VACATION IN 28 MINUTES

a theta pattern and holds you there," say the scientists. "This slows down the brain and frees the mind." The resulting psycho-physical state of deep relaxation, and whole brain synchrony help you function at optimal levels. You become more intuitive. And show improvements in I.Q., memory, creativity, mental clarity, and

Space Tomato Seeds to See Rhizosphere

Be the first on your block to bite into a tomato grown from a seed that spent 5½ years in space before it got to try out life in the rhizosphere. Sounds crazy? Well, the National Aeronautics and Space Administration (NASA) is going to make that possible for as many as 4 million student gardeners and their friends.

Next month during space shuttle mission 32, NASA plans to reel in an 11-ton satellite that has warehoused 12.5 million tomato seeds and a host of other materials. The seeds are to be distributed in packets of 50 along with 50 control seeds as part of a kit to allow students to conduct classroom experiments. The kits, which will include computer data collection booklets, are to be distributed to schools around the country in late February.

Educators interested in having their students see how some space traveling seeds measure up in the rhizosphere against their Earth-bound cousins should contact the NASA SEEDS Project, Educational Affairs Division, Code XEO, NASA, Washington, D.C. 20546.

Fusion Reactor Nearing Breakeven

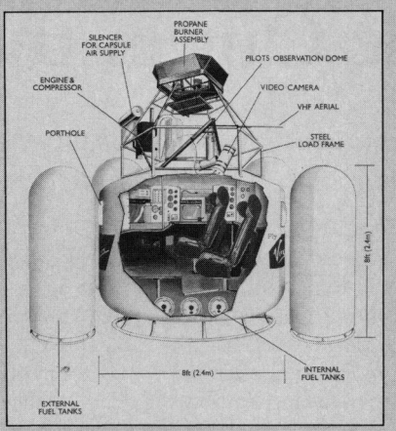
The Joint European Torus, (JET), the European Community's giant tokamak fusion research reactor located in England, may be positioned to reach the long-sought energy break-even boundary sometime next year.

Expectations that the doughnut-shaped reactor will soon reach $Q = 1$ (to create as much energy as is required to produce the fusion of hydrogen atoms) are based on recent results attained in JET. During a brief 3-week period in September, the machine was able to confine a plasma at sufficient temperatures to reach the equivalent of 0.65 of Q in a reactor fueled with deuterium and tritium. World record levels of 0.8 Q were attained for 0.1 seconds.

The records were reached by using for the first time a beryllium-tiled limiter, a device used to shape the magnetically confined plasma. The tiles significantly reduced the amount of carbon and oxygen contaminants that had been retarding ion density and heating in the plasma. Jet scientists had to shut down the tokamak until April so that they can replace more graphite tiles with beryllium ones. Then they'll resume their drive for breakeven.

Meanwhile, physicists at the Princeton Plasma Physics Laboratory are not ready to concede the playing field to the Europeans. Although the more powerful JET tokamak has now taken the lead from Princeton, which had previously held the record at 0.5 Q, U.S. researchers will try to recapture it. In the months ahead, they plan to use boron in their Tokamak Fusion Test Reactor to overcome carbon contamination—and they envision a neck-and-neck race to the high-energy grail.

Pacific Balloonists to Sample Jet Stream



Trans-Pacific balloon *to carry capsule fitted with Japanese air sampling devices.*

The Japanese Meteorological Agency is hitching a ride with two British balloonists who are attempting to cross the Pacific Ocean in the largest hot air balloon ever built.

Michio Hirota, a pollution specialist with the agency, has put air-sampling equipment on board the balloon's command capsule, which will house famed balloonist Per Lindstrand and entrepreneur Richard Branson. The researcher plans to analyze air samples taken from the jet stream to see what kinds of chlorofluorocarbons may be present. The data will be shared with the British Antarctic Survey and other researchers.

The project is consistent with the mission of the balloon flight, which is to support efforts to clean up the environment and to combat global warming. Branson's entertainment company, the Virgin Group, has promised to plant a tree in California for every mile flown in what is being called the "Trans-Pacific Balloon Challenge."

The flight plan calls for the balloon to leave Japan by 15 December and land in California within 5 days. The balloon is to be maintained at an average altitude of 33,000 feet for 6,200 miles. In 1987, Linstrand and Branson became the first hot air balloonists to cross the Atlantic. That 3,075-mile trip took 32 hours.

Grading the University

At some colleges and universities, students are given the chance to grade their courses and professors. Now the University of Texas is carrying this a step further: the Students Association is coordinating a "grade the university" program to tap student opinions on everything from teaching to financial aid.

According to the *Daily Texan*, students will be given a questionnaire jointly designed by a student association committee and sociology professor John Butler. The committee intends to deliver the results to politicians and education officials across the nation.

Japanese Wire for U.S. SSC Magnets?

Quality, the hallmark of Japanese electronics and automobile manufacturers, is coming to the Superconducting Super Collider (SSC) wire courtesy of a Japanese electrical cable manufacturer, Furukawa Electric Corporation. Although the company *has* provided only a small amount of wire so far, U.S. scientists and government officials are wringing their hands. What if the SSC becomes dependent on Japanese suppliers?

The copper-clad niobium-titanium wire, which is woven into a cable, is the key component of the collider's 10,000 magnets. Furukawa is one of five vendors supplying cable for building test magnets. But engineers at Brookhaven National Laboratory say the Japanese cable has been some of the best it has received. Its only deficiency is said to be in current-carrying capacity, which is slightly below that of the 6-micron wire provided by such U.S. suppliers as Intermagnetics General of Guilderland, New York, Supercon of Waltham, Massachusetts, and Oxford Superconducting Technology of Carteret, New Jersey.

But while Furukawa tackles this one weakness, SSC officials fret that unless federal dollars are directed toward U.S. companies, they could lose wire contracts to Japanese competitors.

Wire supplied to date by U.S. companies is sometimes flawed and delays magnet production—largely because of poor quality control. DOE officials hope their increased purchases of U.S. wire will provide the cash to help U.S. suppliers make manufacturing improvements.