

edited by CONSTANCE HOLDEN

Nature Supplies Lens For Astronomers

The gravity of a massive object can bend the path of light coming from more distant objects, a phenomenon that has allowed astronomers to use such objects—namely, clusters of galaxies—as gravitational lenses. The amount and type of deflection—a product of the strength of the lens's gravity, which is in turn related to the mass of the lens—can give astronomers information about even more distant galaxies as well as on how matter is distributed in the cluster itself.

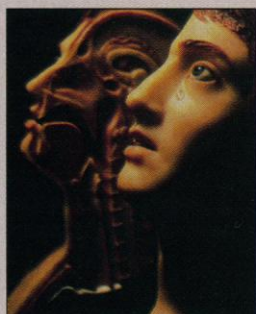
In the past, finding good gravitational lenses was a matter of luck. Scientists assumed most optically visible clusters had the requisite density, but when astronomers have surveyed those clusters the results have been disappointing: Only a few percent of them seem to act as gravitational lenses. Now a group of astronomers at the University of Hawaii and the Canada-France-Hawaii Telescope Corp. has proposed that galactic clusters that emit x-rays are the most likely lenses around.

According to a paper in the 20 October *Astrophysical Journal*, G.A. Luppino and I.M. Gioia and their co-workers report the lens-hunters may have been looking in the wrong places. Instead of observing a randomly selected sample of galaxy clusters,

this group is surveying only those clusters that have been discovered through their x-ray emission. The x-rays come from hot gas between galaxies in a cluster, and they are emitted only when

there is a lot of gas—which means a cluster is particularly dense.

The results vindicate this novel approach: Gravitational lensing occurs in at least a quarter of their sample of 41 clusters.



Anatomy as sculpture.

La femme à la larme (woman with tear), waxwork by surgeon André Pinson, 1784.

(bodies from which skin has been stripped to teach anatomy) and strikingly lifelike wax anatomical models, as well as paintings and drawings demonstrating artists' interest in dissections. Then there are a host of 18th-century scientific machines, many of them works of art, such as the duck made by automaton maker Jacques Vaucanson, which not only ate grains but "digested" and excreted droppings, or the "magnetizing bucket," a masterpiece of cabinetry used by Anton Mesmer.

The connection between psychiatry and art is particularly strong. Psychiatrist Emile Charcot, coiner of the diagnosis of hysteria, looked for signs of the disorder in ancient art, and surrealists celebrated the "50th anniversary of hysteria" in 1934. Works by artists from Chardin to Dali show that physiognomists (who believed the face mirrored the mind) and phrenologists influenced portrait painters, sculptors, and cartoonists; Lamarck and Darwin gave rise to the evolution-inspired fantasies of the artist Odilon Redon.

The exhibit is largely the idea of Jean-Pierre Changeux, director of the molecular neurobiology laboratory at the Pasteur Institute and professor at the Collège de France, who has worked for 3 years with Gérard Régner, curator of the Picasso Museum in Paris, to bring it off. The show opened to raves from Paris intellectuals, yet Changeux, a prominent neurobiologist who is interested in looking for brain centers specifically involved in aesthetic functions, does not see cause for celebration today. "The two worlds, art and science, are now more apart than at any time in the previous two centuries," he says. "Art is now gratuitous and without any ethical meaning," while "science has become so overspecialized" that it is no longer linked with art.

Art et Science

Two hundred years ago, the mathematician d'Alembert, one of the authors of Diderot's *Encyclopedia*, wrote that "it is easy to observe that sciences and arts mutually help each other and that a link unites them." Now, an ambitious exhibit, "Ame au corps," which opened in late October in Paris' Grand Palais exhibition hall, illustrates the nature of that link through more than 1000 art and science objects from around the world.

The show, covering two centuries and three floors of the Palais, starts with medical school exhibits: écorchés



Good vibes. Mesmer's magnetizing bucket, 1784. Patients (mostly women) held on to the metal handles and swooned.



Lens. A cluster known as MS 0440+0204 has disclosed some 15 blue arcs (a few of them visible in the photo above) in its compact core. These arcs are presumably the distorted images of a more distant object.

Pan-European Drug, Environment Agencies

After months of acrimonious debate over the Maastricht Treaty on European monetary and political union, the leaders of the 12 European Community (EC) states last month celebrated the treaty's ratification by picking the sites for a raft of new EC institutions. Among them are two important science-based agencies: The European Medicines Evaluation Agency (EMEA), which will register new drugs, and the European Environment Agency (EEA), which will gather data on the state of Europe's environment.

The EMEA, which will allow companies to obtain pan-European licenses to market new drugs in one application, will open in London in 1995 with a staff of 150. The new system should provide an initial decision within 210 days of a company providing a complete dossier on a new drug, including the results of clinical trials. If so, that's good news for the drug industry, which has long complained that in some EC states—such as Germany—it can take 3 years to register a new drug.

The EEA, meanwhile, is to be based in Denmark and will set up shop in rented accommodations in Copenhagen, with an initial staff of around 40, before the end of the year. It won't come a moment too soon. Although the EC has in the past few years produced a welter of environmental legislation—on topics ranging from the release of genetically engineered organisms to the maintenance of water quality—it has done so in a data vacuum, since there are few reliable pan-European environmental statistics. The EEA's first job is to rectify this situation, aided by a handful of "topic centers," to be set up at leading European environmental science labs. But some scientists believe that EEA in the future may have to develop a policing role.

The EC actually decided to form the EEA more than 3 years ago, but the French government held up site selection for the agency until the other EC states

agreed that the European Parliament would continue to hold half its sessions in Strasbourg, rather than moving full-time to Brussels. Having finally obtained that pledge, France has agreed that the EEA can open its doors.

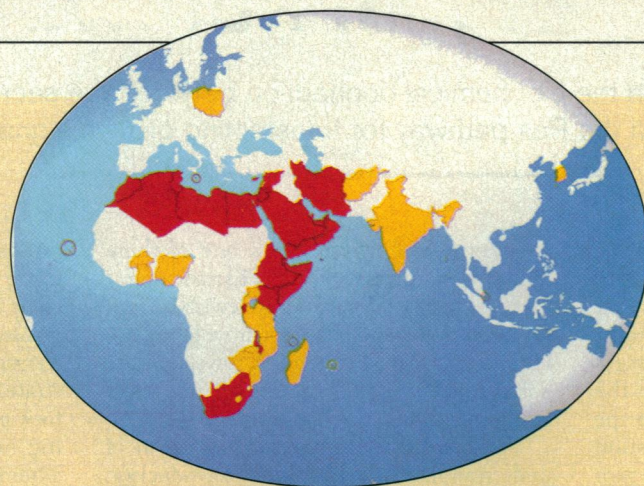
UFO Sighters not Batty, Study Finds

If someone told you the vivid story of their abduction by aliens, at the very least you'd think they had an overactive imagination—and most research would back you up. Many studies have shown that individuals who claim to have encountered flying saucers or extraterrestrials are substantially more fantasy prone—and likely to believe those fantasies—than average and possibly more easily hypnotized, since so many UFO reporters first “remember” the experience under hypnosis.

But in the 1 November issue of the *Journal of Abnormal Psychology*, psychologist Nicholas Spanos and his colleagues at Carleton University in Ottawa suggest that people who see UFOs are just as down to earth as the rest of us. The Carleton group tested 49 people who claimed to have seen UFOs and 127 who hadn't. All underwent tests to measure IQ, mental stability, fantasy proneness, hypnotizability, and their belief in the paranormal. Almost all were white-collar workers with at least some college education, says Spanos.

As a group, the UFO sighters were no less intelligent or mentally stable than those who had never seen a UFO, and they were no more fantasy-prone or easily hypnotized. Indeed, the only area where they differed was that they believed in the existence of UFOs. And, the UFO sighters actually scored lower on the fantasy proneness test than the others. This makes sense to Elizabeth Loftus, a psychologist who studies false memories at the University of Washington in Seattle, and who believes that those who report seeing UFOs probably just experience the same memory distortions we all do. “Memo-

PAI



In the red. Water “stress” (yellow) is defined as fewer than 1000 cubic meters per person per year; “scarcity” (red) is fewer than 500. By 2000, countries in Africa and the Middle East will be especially hard hit. Ironically, the African Academy of Sciences declined to sign an unprecedented joint statement on world population growth that was signed by 56 science academies in New Delhi last month.

Global Water Scare

By 2025, the number of people living in water-short countries will nudge the 3 billion mark, up from 335 million in 1990, according to a new report from Population Action International (PAI). Since snow and rainfall are relatively constant, renewable water is essentially finite. Many countries are drawing down groundwater supplies—and new water sources, such as from icebergs or desalination, are too costly to offer a solution, according to the report. Some governments are only dimly aware of what's happening, said PAI's Joseph Speidel at a press conference last week, and they “are not distinguishing between renewable and nonrenewable water in their longterm planning.” In Israel, high on the list of water-scarce nations, there is talk of phasing down agriculture and raising food imports to make enough water available for urban residents.

So far, efforts to improve water supplies are being nullified by population growth, said California-based water consultant Peter Gleick. During the 1980s, declared by the United Nations to be the Decade for Clean Drinking Water, 750 million people without sanitation services got such services. But during that time, 750 million new people were added to the planet.

ries get distorted by wishes and thoughts,” she says. “This is just a little more extreme.”

The Carleton group does not suggest that UFO reports should now be accepted at face value—in fact they initiated their study to pinpoint the mechanism that leads people to experience such false memories. Spanos had expected that increased fantasy proneness and hypnotizability would be that mechanism, but having cast doubt on that theory, he hopes to search for other possibilities with a larger group of UFO sighters.

Second-Hand Leukemia

Not only do oncology nurses have a tough job, giving both medical and emotional support to cancer patients, but they may have a dangerous one as well: An epidemiological study suggests that young nurses have a particularly high risk for developing leukemia.

For years physicians have known that cancer patients who undergo chemotherapy often develop new cancers, especially leukemia. Many anticancer drugs, such as cyclophosphamide, chem-

ically alter the DNA of both tumor cells and normal cells, apparently triggering new cancers.

While the benefits to patients may outweigh these risks, the possible danger to nurses rang an alarm bell for epidemiologist Jeanne Hewitt, an assistant professor at the University of Wisconsin at Milwaukee's School of Nursing and a former oncology nurse. To assess the risk to nurses, Hewitt dusted off some old American Cancer Society data (collected between 1959 and 1973) on 13,500 female nurses. After controlling for cancer risks such as smoking and alcohol use, the researchers found no difference between the overall cancer rates of the nurses and an age-matched control group of 37,000 female teachers.

But Hewitt knew that 88% of the Oncology Nursing Society's members were under age 50, so she zeroed in on the under-50 cohort in the group on the assumption that many would have been exposed to the drugs. This approach was more fruitful: Younger nurses (age 30 to 49), about 60% of the total, were nine times as likely to develop leukemia as young teachers. (More nurses than teachers also developed bladder cancer, but there were too few cases for this finding to be of significance.)

Hewitt attributes the increased cancers to anticancer drugs, which she says nurses may be exposed to either through inhaling powdered preparations or by touching medication diluted for injection into patients.

The next step, Hewitt says, will be to conduct a prospective study of cancer rates in oncology nurses with the aid of improved measures of nurses' exposure to anticancer drugs. Hewitt presented her preliminary findings last week in Baltimore at a conference called “Women's Health: Occupation and Cancer.” A team led by epidemiologist Elsebeth Lynge of the Danish Cancer Society reported similar findings, in a smaller subject population, last December.