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Cover: Atoms deposited randomly on a crystal surface can organize themselves into distinctive, characteristic patterns. This image from a computer simulation of the process shows the kind of branched structures that may arise, depending on the rate of deposition and diffusion of particles across a surface. (Image: Jensen *et al.*)



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Science Service, which publishes SCIENCE NEWS, is a nonprofit corporation founded in 1921. It gratefully accepts tax-deductible contributions and bequests to assist its efforts to increase the public understanding of science, with special emphasis on young people. More recently, it has included in its mission increasing scientific literacy among members of underrepresented groups. Through its Youth Programs it administers the International Science and Engineering Fair, the Science Talent Search for the Westinghouse Science Scholarships, and publishes and distributes the *Directory of Student Science Training Programs for Precollege Students*.

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Letters

Defeminizing hormonal horrors

The statement that "through pollution and other environmental factors, Mother Nature is exerting a feminizing hormonal influence on the animal kingdom" is false, misleading, and absurd ("The Gender Benders," SN: 1/8/94, p.24). Since when do human commercial-technological products and by-products qualify as Mother Nature?

Lynn Bornholdt
Pullman, Wash.

It hurts to have you label the very serious problems of species health and fertility as "That Feminine Touch" (SN: 1/22/94, p.56).

If the feminine were more valued and understood in our culture, we wouldn't be facing such problems as "a generation that cannot reproduce" — due to *man-made* estrogens now polluting our environment.

Claire Townsend
Los Angeles, Calif.

Environmental pollution is sterilizing males? Nonsense!

I ask you: Would Daddy Warbucks and his good American buddies do a thing like that to themselves? Of course not. It's just anticapitalist propaganda from tree-hugging environmentalists in cahoots with the godless feminists, that's all.

Constance Kite
South Burlington, Vt.

I was very unhappy and angry when I encountered for the first time the expression "the default pathway." Only a man would have come up with such a term in regard to female anything.

My husband tried to placate me by saying the term was just common computerese. My response was that fecal matter is fecal matter even in a rose garden.

Surely a less distasteful term could be found.
Joan E. Mason
Wellsboro, Pa.

I am the last woman in the world who would

want men feminized. But I cannot be concerned about "the economic cost of having a generation that cannot reproduce."

In 60 years, two generations have more than doubled a human population it took 2 million years to create. We are already making down payments on the economic cost of reproduction, although as nations we shut our eyes to it.

There are certainly individual tragedies in the inability to reproduce. But from a species standpoint today, eliminating some players from the reproductive game can only be a boon.

Carol S. Dumond
Eugene, Ore.

Ingested hormones can come from drugs as well as chemical pollutants. An example is the "growth hormones" with estrogenic effects injected into meat animals in the United States for years. Soon milk and milk products sold in this country will come from cows given somatotropin hormone to boost milk produc-

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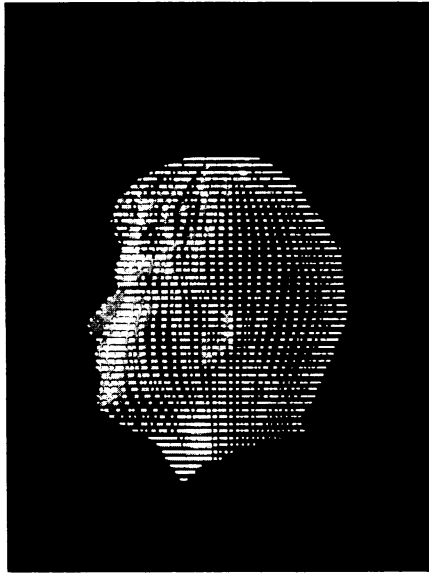
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from pixel-by-pixel motion detectors, the system marries this input to a simulated face mask rooted in human anatomy. Among its many virtues is its ability to portray an authentic smile by mimicking the raising of eye corners that accompanies the upturning of lips. With a built-in understanding of typical facial gestures, the computer tailors the animated image to an individual's face within a split second. For pure animation, it will generate facial movements.

But why stop at faces? Why not simulate, even automate, whole-body animation? Why not train a computer to watch athletes, dancers, or movie stars and learn their special, subtle moves? A Larry Bird lay-up, a Charlie Chaplin waddle, perhaps a Judy Garland croon. Envision a computer that could take in a great ballet and from the dancers' movements narrate the story.

At the Media Lab, such visions not only raise no eyebrows, they live as bona fide project goals. In a new system called ALIVE, a person wandering before the computer's gaze can watch a replica of himself or herself moving in a virtual world. Within the confines of a virtual 16-foot by 16-foot room, animated autonomous agents roam free in a land of illusion, interacting with other virtual beings.

This project aims, according to Pattie Maes, an MIT computer researcher, to create an artificial environment in which a person can interact, in natural and believable ways, with autonomous, semi-intelli-



Mapping a whole head.

gent replicas whose behavior appears equally natural and believable.

In other words, an automated animation system with no strings attached. Literally. No headgear. No wire-laden data gloves. A system in which a live person's video image unobtrusively feeds a "magic mir-

ror" that interprets that person's silhouette and gestures in real-time, three-dimensional space.

Meanwhile, the user's virtual playmates wander independently in a world they appear to sense, acting on self-generated goals and taking cues from the user's gestures.

In one virtual world, for example, an animated puppet comes over to play, taking the user's virtual hand. When motioned away, the puppet pouts and leaves. When waved back over, the puppet returns giggling. Another virtual setting brings a hamster begging for a meal. Food from a virtual table curbs its appetite, followed by a virtual rub of its virtual tummy. When a predator enters the scene, the hamster scampers away.

In the real world, where most communication occurs without words, such humanized computers represent invaluable learning tools. Since bodies and faces hold such expressive power, one can often glean more about a person's actual moods, intentions, or beliefs from gestures and expressions than from words.

"If a computer has a more human face and is less [emotionally] cool to work with, people can interact with it more naturally," Maes says. "Humanlike agents could train, educate, and motivate people, give personalized feedback, or do tasks for you. But for that to happen, computers must understand facial expressions and gestures as a way of communicating." □

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tion. This hormone is supposed to be safe for humans to eat. However, only if our milk supply is carefully labeled will it be possible to determine the real effects of milk from these cows on humans or other species.

Such labeling is not now required, but it should be.

Joanne Ashley
Manlius, N.Y.

I am a chemical engineer who has been working in hazardous waste management and permitting for almost 23 years, and I have recently spent a great deal of time reviewing Greenpeace's pseudoscientific documents. The documents I have reviewed are always misleading, technically incorrect, biased, and never peer-reviewed. Seeing a Greenpeace report quoted in your magazine, as if it were a credible scientific organization, concerns me greatly because of the implicit approval.

Jim Cudahy
Knoxville, Tenn.

Many toxic substances like DDT build up in fatty tissues. What happens to toxins if a person diets and loses fat? Is the person subjected to a secondary poisoning by the rerelease or megadose of concentrated toxins?

Gregory Hill
Reading, Pa.

The simple answer is yes. As dieting releases fat into the bloodstream, it is recirculated throughout the body. This also explains why nursing —

which releases breast fat into milk — can transfer relatively high concentrations of fat-stored toxicants to a baby (see "Organochlorines lace Inuit breast milk," 2/12/94, p.111). — J. A. Raloff

The indictment of chlorine in the environment appears to be alarming, but the inconsequential factoids supporting it make a hash of reasoned (and reasonable) discussion.

What meaning can one attach to the statement that "42 chemicals or classes of chemicals [are] reported to affect the reproductive or hormone system. Twenty-three of the compounds — 55 percent — contain chlorine as an essential ingredient"? How many of these chemicals or classes of chemicals contained such "essential ingredients" as nitrogen, phosphorus, sulfur, sodium, potassium, or half a hundred other elements? Certainly, carbon and hydrogen show up 100 percent of the time.

Abolish chlorine usage? Ask people to stop using bleach and table salt? Ask sewage treatment and water treatment authorities to stop chlorinating? If we abolish the use of chlorine, then plague, pestilence, and famine will sweep across the world. Of course, we'll survive at reduced population levels, but that's OK because our hearts are pure.

Charles J. Sterner
Bethlehem, Pa.

Lifetime vs. annual cancer rate

"Sunscreen can't give blanket protection" (SN: 1/22/94, p.54) states that 1 in 105 Americans will develop melanoma and that 20 percent of them will die from it. At a current U.S.

population of approximately 260 million, this would correspond to around 500,000 deaths per year. The article stated that in 1993 there were 6,800 deaths.

Is this an error in the statistics or a very aggressive projection of melanoma cases?

Matthew L. Young
Chaska, Minn.

Not that aggressive! Actually, 1 in 105 people in the United States will develop melanoma in the course of a lifetime, not each year. — T. Adler

No hocus about this focus

Talk about hocus-pocus (hocus-focus?). The article on biodiversity ("Biodiversity helps keep ecosystems healthy," SN: 2/5/94, p.84) shows two pictures. One is of the blue sky, the other a closeup chock-full of plants. One shows green and brown grasses, the other a pretty pink flower.

I hope your readers were not as fooled by the psychological photographic trickery as you were.

A. Robert Spitzer
Royal Oak, Mich.

The story is based on data, not photographs. It would only be trickery if the images misrepresented what the data say. — E. Pennisi

Address communications to:

Editor: SCIENCE NEWS
1719 N Street, N.W.
Washington, D.C. 20036

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