# Biomedicine

## Less publishing is more

A topic of increasing concern and discussion in scientific circles is the quality of the scientific literature and the honest mistakes and outright fraud that can grow out of the pressure to publish. Now Harvard Medical School in Boston has taken what the July 29 SCIENCE calls "an almost bold step" toward addressing the problem. The school issued guidelines suggesting that hiring and promotion decisions be based on no more than 10 scientific papers for a candidate for full professor, seven papers for associate professor and five for assistant professor.

Young investigators, the guidelines say, deserve careful supervision: "A preceptor who limits his/her role to the editing of manuscripts does not provide adequate supervision." In addition, they say, too many authors have been appearing on papers, and those authors whose names do appear should bear responsibility for the work. Investigators also are advised against "bibliography building" through the rapid publication of fragments of a study or by multiple submissions of similar work to various journals. A committee appointed by Dean Daniel C. Tosteson drew up the recommendations, which went to all faculty and researchers.

## Testing, testing: CD4

CD4, a drug designed to prevent the spread of the AIDS virus to new cells, entered preliminary safety trials in humans last week at the National Cancer Institute in Bethesda, Md. Two more medical centers also will test the drug. A total of about 50 patients with advanced AIDS will receive the treatment.

A genetically engineered protein, CD4 is named for a naturally occurring protein found on the surface of T4 helper cells, immune system cells that are particularly vulnerable to the virus (SN: 6/25/88, p.405; 1/16/88, p.40). The virus infects by attaching to CD4 protein to gain entry to the cell. The drug CD4 functions as a decoy, binding the virus before it can attach to infect cells, multiply and destroy the cells. It is the first AIDS treatment to be tested in humans that was designed based on the structure of the virus. Theoretically, it might be used to prevent infection immediately after exposure to the virus.

Large-scale testing will begin if all goes well during the preliminary safety trials, which are expected to take about six months. CD4 is not expected to be the last word in AIDS treatment, and other work suggests it may be more effective in combination with other treatments, such as zidovudine (AZT), which interrupts viral replication inside the cell.

## Epidemic of war deaths

Although medical research often addresses the causes of homicide, suicide and other "private" human-caused deaths, it rarely addresses the more "public" deaths of war. But the scale of such deaths in the 20th century is comparable to the scale of deaths in prior centuries due to epidemic diseases, observes Richard Rhodes of the Massachusetts Institute of Technology in the Aug. 5 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

Since 1700, wars have claimed more than 100 million lives worldwide, and more than 90 percent of these deaths occurred in the 20th century, Rhodes says. The ratio of civilians to combatants in the death toll has also increased steadily: Historically, about 50 percent of war-related deaths were civilian – but by the 1970s, civilians accounted for 73 percent of war deaths, and in the 1980s so far, the figure has risen to 85 percent, he says. Rhodes defines war as an armed conflict including one or more governments and causing the death of 1,000 or more people per year.

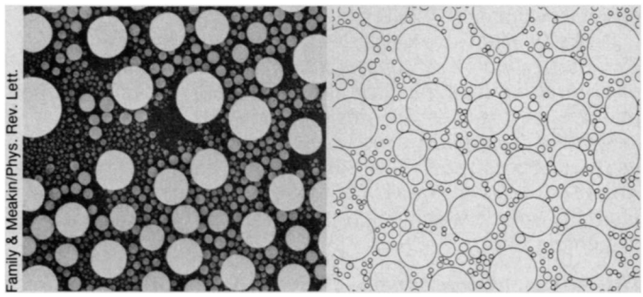
Health professionals should monitor and report this neglected mortality as "a first step toward a remedy to man-made death, the most terrible scourge of the 20th century," he concludes.

# Physics

## Getting the drop on thin films

A thin layer of vapor-deposited tin forming on a hot sapphire substrate starts out as a collection of tiny droplets. As more tin atoms come to rest on the surface, new droplets form and older droplets grow and coalesce until a complete layer eventually forms. Two physicists have now developed a simple model that mimics this process, realistically reproducing the way the distribution of droplet sizes changes over time.

Fereydoon Family of Emory University in Atlanta and Paul Meakin of Dupont's Central Research and Development Department in Wilmington, Del., start with the idea that two distinct mechanisms govern a vapor-deposition process: Droplets grow by absorbing vapor and by coalescing when they touch. In their model, droplets of a fixed size are randomly added to a surface. Whenever two droplets touch or overlap, they fuse into a larger droplet. Computer simulations of this process match experimental observations (see illustrations) that the zones around large droplets tend to have fewer small droplets than found elsewhere on the surface. Such depleted regions are left behind by the coalescence of two large droplets, before new droplets have a chance to accumulate there.



Family & Meakin/Phys. Rev. Lett.

This model seems to apply best to a vapor-deposition process in which the substrate's temperature is near or just above the condensing material's melting point, as in the case of tin deposition on a sapphire surface at 230°C. "Similar studies could provide valuable insights and introduce new approaches for theoretical and experimental investigations of the kinetics of droplet formation and thin-film growth," the researchers report in the July 25 PHYSICAL REVIEW LETTERS. Thin films play an increasingly important role in a variety of applications, from microelectronics to biochemical sensors.

## Thick-skinned lithium cores

A Japanese group working at the Lawrence Berkeley (Calif.) Laboratory has identified what appears to be a thick neutron skin, or "halo," around the three protons at the core of a neutron-rich lithium isotope. The Japanese researchers studied the disintegration of lithium-11, which contains seven more than the typical number of neutrons associated with lithium. Their observations, reported in the June 20 PHYSICAL REVIEW LETTERS, show that the two outer neutrons are only weakly bound to the rest of the nucleus. These neutrons interact strongly with each other, producing the effect of a skin or halo that may extend to several times the normal radius of the isotope's charged nuclear core.

"Because . . . neutron-saturated nuclei are the closest one can get to having a neutron star in the laboratory, this unexpected finding is likely to influence predictions of the structure and properties of very neutron-rich objects," P.G. Hansen of the University of Aarhus in Denmark comments in the July 21 NATURE. "Such nuclei will also give interesting insights into the structure of other loosely bound quantum systems." One example of such a system is a molecule made up of three helium atoms, which may be marginally stable at low temperatures, whereas pairs of helium atoms are unstable.