RANDOM SAMPLES

edited by LISA SEACHRIST

Comparative Biology

While the National Academy of Sciences struggles to complete its standards for precollege science education in the U.S.—now 5 months overdue—educators are learning what their foreign counterparts expect of their students.

A lot, to judge from a report on science tests that people in other countries must pass if they want to go to university. The report, the first in a series cosponsored by the American Federation of Teachers and the Washington, D.C.–based National Center for Improving Science Education, appeared last month. Called "What College-Bound Students Abroad Are Expected to Know About Biology,"* it contains recent samples from the British A-Levels, the French Baccalauréat, the German Abitur, and the Tokyo University entrance exam—as well as a U.S. Advanced Placement exam. Unlike the U.S. exam, these tests have few multiple-choice questions, requiring instead sophisticated problem-solving skills and thorough understanding of concepts.

The Baccalauréat, for example, in a section called "organized recall of knowledge," directs students to "show that the hypothalamus is the integration center in fighting cold. In doing this, explain the process of integration of afferent messages at the level of a neuron of this center, and using the example of an effector controlled by hormones, show that the hypothalamus participates in maintaining body temperature in response to cold by adapting the response of the effector selected." A suggested answer takes a full page.

Senta Raizen, director of the science education center, says she hopes the report will serve as "something of an awakening cry for biology teachers." Chemistry, physics, and math teachers will get their wake-up calls in reports due to appear later this year.

*The 108-page report is available for $10 from AFT Order Department (Item #250), 555 New Jersey Avenue NW, Washington, D.C. 20001–2079.

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Well preserved. Ötzi was entombed in ice for 5000 years.

Iceman Gets Real

Ötzi, the Ice Man, is for real. Ever since hikers discovered the mummified body of a 5000-year-old Stone Age man in a melting glacier in the Ötz valley in the Alps 3 years ago, a few skeptics wondered whether Ötzi was an imposter—a South American mummy planted in the glacier as a hoax. Not to worry, reports a team of biologists led by Svante Pääbo of the University of Munich on page 1775 of this issue. Ötzi probably is a European—a northern European, to be precise.

When Pääbo's team analyzed fragments from mitochondrial DNA (mtDNA) taken from muscle, tissue, and bone in Ötzi's left hip, they found that one 360-base pair segment of the mtDNA most closely matches mtDNA of modern Europeans living north of the Alps—particularly in Germany, Denmark, and Iceland. The sequence never shows up in sub-Saharan Africans or in American Indians. And that's good news for scientists. Says Pääbo: "It removes all the suspicions that the body was a fraud—that a body was placed in the ice."

Pääbo's team took special precautions to make sure it was analyzing Ötzi's DNA and not a contaminant from one of the other northern Europeans who have handled the body since it was hacked out of the ice. The group sent the DNA to a lab in Oxford, England, for independent corroboration of their results, and Pääbo's team based its findings on analysis of smaller fragments of DNA, which are more likely to be ancient. Old DNA is expected to have degraded into small fragments, while the newer, contaminant DNA from modern Europeans should be longer on average. Having succeeded once, Pääbo is now seeking more clues from the Iceman's DNA. He hopes to trace Ötzi's roots more precisely—and see whether the body contains ancient viruses.

Antibody Marker Flags Future Diabetics

Insulin-dependent diabetes mellitus (IDDM) is an insidious disease: It strikes without warning, and if untreated, can plunge patients into a life-threatening coma. Now a Finnish-Australian team may have found a marker that can detect people who will eventually develop the disease—opening the possibility of starting preventive treatment.

The researchers, from Monash University and the International Diabetes Institute in Victoria, Australia, and the Finnish National Public Health Laboratory, report in the 4 June issue of *The Lancet* that they've detected antibodies against glutamic acid decarboxylase (GAD), an enzyme found in large quantities in the pancreatic islet cells—the cells destroyed in IDDM—in around 80% of stored blood samples collected from IDDM patients before they were diagnosed with the disease. Some of the serum samples, which were collected from pregnant women by the Finnish health system, contained antibodies up to 10 years before the women had symptoms.

Until now, the leading candidate marker for IDDM was ICA, an antibody that reacts against pancreatic islet cells. While ICA also appears before IDDM symptoms, the test is difficult to interpret. By contrast, anti-GAD is detected by a simple blood test. "With this antibody, you could start screening populations," says Eva Toumilehto-Wolf of the Finnish National Public Health Laboratory in Helsinki.

Other diabetes experts warn against rushing into screening. One problem, says Edwin Gale of St. Bartholomew's Hospital in London, is that the Finnish/Australian team tested too few healthy controls to tell if it is a reliable marker. While researchers hope one day to slow—or prevent—the onset of IDDM, preventive treatments are still being tested. Nevertheless, Gale says the results are "extremely promising," and he is testing the marker's reliability on his own patients.

FEDERAL SCIENCE GRANTS: THE TOP 20 UNIVERSITIES

Institution	Total $ (millions)
1. Johns Hopkins U.	660.7
2. U. of Washington	280.1
3. Mass. Inst. of Tech.	275.3
4. Stanford University	270.1
5. U. of Michigan	233.8
6. Wisconsin-Madison	222.2
7. Cornell University	218.5
8. U.C. Los Angeles	215.8
9. U.C. San Diego	215.0
10. U. of Minnesota	212.1
11. U.C. San Francisco	209.6
12. Columbia University	202.1
13. Harvard University	198.3
14. U. of Pennsylvania	193.4
15. Yale University	190.4
16. U.C. Berkeley	185.2
17. U. of Pittsburgh	178.1
18. Pennsylvania State U.	176.0
19. U. of Colorado	167.4
20. UNC–Chapel Hill	151.1

SOURCE: NSF/SRS, Survey of Federal Support to Universities, Colleges, and Nonprofit Institutions in FY 1992