BIRD EVOLUTION

Surprise Hummingbird Fossil Sets Experts Abuzz

If it’s hummingbirds you’re after, the New World is the only place to be. Of the 300-plus species of the hovering, nectar-sipping birds, almost all live in Central and South America. Experts agree that all species of modern hummingbirds evolved there and later spread to North America, but it appeared they had never set wing in Eurasia.

Now, fragile bones in 30-million-year-old rocks from southern Germany show that hummingbirds were much farther-flung than anyone expected. “The amazing thing about this fossil is that it’s essentially a modern hummingbird,” says Margaret Rubega of the University of Connecticut, Storrs. “My mind is a little blown.” The discovery, which or-nithologist Gerald Mayr of the Forschungs-institut Senckenberg in Frankfurt, Germany, describes on page 861, raises questions about where early hummingbirds evolved and why the European ones became extinct.

Hummingbird history has long been shrouded in mystery, chiefly because the delicate-boned creatures have left so few fossils. None at all have been found in the Western Hemisphere. Hints of Old World origins appeared when a possible primitive insect-eating hummingbird, Parornis messelensis, turned up in 49-million-year-old rocks in Messel, Germany. The only other fossil hummingbirds are the 30-million-year-old Argornis caucasicas and Jungornis tessellatus, both incomplete, from the Cauca-sus. They appear to have been able to hover, but it’s not clear whether they had modern-style beaks. Last year Mayr classified all three as “stem taxa,” extinct relatives that share a common ancestor with modern humming-birds, but not all experts were convinced.

UNDERGRADUATE SCIENCE

Harvard Joins Reform Movement

BOSTON—Harvard University has joined a growing number of elite schools attempting to revamp undergraduate science education. The effort, which is part of a larger rethink- ing of Harvard’s entire undergraduate pro-gram, could double the number of science courses required of nonscience majors, pro- vide a more interdisciplinary approach to life and physical sciences, and encourage students to conduct research abroad.

Last week, a panel of students, faculty, and administrators delivered a 69-page re-port* that proposes new introductory science courses and urges the university to give its undergraduates “a genuine view of the ex-citement of research science.” Scientists across the country say that changes at Har- vard College, to be spelled out over the next year, are sure to spark increased interest among other universities in overhauling under-graduate science courses.

The reform movement is driven by con-cern that many undergraduates are turned off by their science courses and leave school without an appreciation for research. To ad-dress that problem, this fall Columbia University in New York City will require that all un-dergraduates take a general course called “Frontiers in Science” (Science, 18 October 2002, p. 531). Taught by star professors, the course will include small weekly seminars. Other schools, such as the University of Michigan, Ann Arbor, are experimenting with greater undergraduate involvement in research projects. And the University of Wisconsin, Madison, has restruc-tured its tenure and merit-pay criteria to encourage better science teaching.

The Harvard report examined the needs of undergraduates in three categories—science majors, those preparing for medical school, and those whose interests lie outside science. It recommends that all under-graduates take one interdisciplinary course in life sciences and one in physical sciences, rather than the current system of choosing an introductory course in one of the two fields. “This is a significant new emphasis on educating all students,” says Harvard biologist Richard Losick, who was involved in the study. “This will be real science teaching, not the history of science or science for poets.”

Those majoring in science, says the re-port, should be given more opportunity to experience how science is conducted by working in a research lab. The report’s em-phasis on international experience, says Losick, should be extended to opportunities for doing lab science around the globe.

Benedict Gross, a mathematician and dean of Harvard College who co-chaired the study, says Harvard this summer will ap-point a science working group to come up with a detailed science curriculum. The de-tails could be ready for discussion by the entire Harvard community by the end of the next academic year, he adds. The last major change to Harvard’s undergraduate curricu-lum took place in 1978.

Harvard’s freshman class of 1650 is tiny compared to the enrollments of many state universities. But outside scientists and admin-strators say having Harvard on board should further their reform campaigns. “This is ter-rific,” says Peter Bruns, vice president for grants and special projects at the Howard Hughes Medical Institute in Chevy Chase, Maryland, which has funded efforts to im-prove undergraduate education. “And it is about time, since we live in an increasingly scientific world.”

—ANDREW LAWLER