PAGE 319
DNA from fossil dung

321
Virtuoso chemistry in an insect

FUNDING

U.K. Government, Wellcome Trust Give $1.75 billion Boost to R&D

LONDON—After more than a decade of budget squeezing by the previous Conservative government, British scientists finally got something to celebrate this week. The new Labour administration's plans for science, announced on Monday, include $1.75 billion in new funds over the next 3 years, a boost that "will transform the science and engineering base," said Trade and Industry Secretary Margaret Beckett. "This major injection of funds," she added, "reverses the decline that our predecessors allowed." And, in an unprecedented partnership, more than one-third of the new money is being provided by the Wellcome Trust, the world's largest biomedical research charity. The announcement is one of the highlights of a detailed review of all government spending, carried out by the new government in its first 14 months in office, that will form the basis of multiyear budget forecasts.

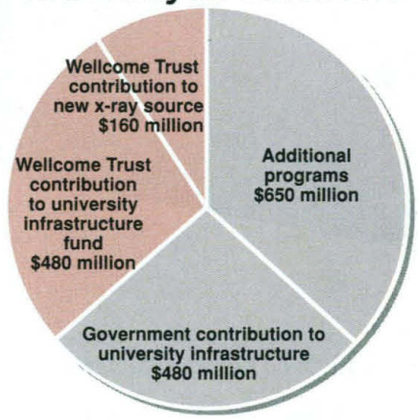
Funding partner. Wellcome's Mike Dexter.

BARKER/EVANS PHOTOGRAPHY

The government's share of the new funds will boost its annual $2.2 billion science budget by 15% over 3 years, to $2.7 billion by 2001–02. The plan is divided into two main parts: The government and the Wellcome Trust will each pay $480 million into an infrastructure fund to build new labs in universities and refurbish outdated ones. A further $650 million of government money will be allocated to the seven research councils for new projects in priority areas such as genetics. In addition, the Wellcome Trust is making a $160 million contribution to a planned $270 million synchrotron x-ray source. "Major investment in these areas is long overdue and is urgently needed," says Ken Edwards, vice chancellor of the University of Leicester. "The government has met our concerns," says Peter Cotgreave, spokesperson for the lobby group Save British Science.

Researchers have waited patiently since Labour was elected in May last year for it to fulfill its election promise to tackle the plight of the country's crumbling research infrastructure. An independent report on higher education, commissioned by the previous government and chaired by long-time education reformer Ronald Dearing, called last July for an urgent injection of $800 million for university labs and equipment (*Science,* 1 August 1997, p. 628). The Dearing report also called on the government to rethink the United Kingdom's "dual support" system for research, in which most of the overhead costs of research are paid directly to university departments, while the running costs of individual projects come from grants from the subject-based research councils. Dearing suggested more of the overheads should be paid out of research council grants, a view fiercely opposed by university heads.

New Money for U.K. Science



TOTAL
$1.75 billion over 3 years

SOURCE: DTI

In its new plans, the government seems to have left dual support intact by providing separate funds for a new infrastructure scheme and new projects by the research councils. Martin Harris, chair of the Committee of Vice Chancellors and Principals, says: "Universities desperately need these funds to upgrade their research facilities. The Dearing report stressed the urgency of this issue. ... We look forward to further announcements within the comprehensive spending review for the other areas of urgent need in higher education: teaching, support for basic research, and the training of tomorrow's scientists." Mike Dexter, director of the Wellcome Trust, says that the trust backed the government's plans because Britain needs a university infrastructure "that meets the requirements of our best scientists, an infrastructure that allows us to compete internationally. It is really distressing to see our next generation of scientists being trained on obsolete technology."

The infrastructure funds will be awarded following competitive bids from universities, says a Department of Trade and Industry (DTI) official. This process is likely to continue the trend, begun under the Conservatives, of concentrating research activity in departments that are already strong in research. Because of the involvement of the Wellcome Trust, at least half of the infrastructure projects will be in the life sciences. The new money for the research councils will be divvied out to individual councils in the fall, but this week's announcement, well ahead of the normal November date for budget statements, will give councils advance notice of new funds and more time to plan new priorities. Again, much of the emphasis will be on biological sciences.

The Wellcome Trust's new partnership with the government will strengthen the enormous influence it already has over British science (*Science*, 26 June, p. 2043, and 22 November 1996, p. 1292). According to a spokesperson, the trust's contribution to the infrastructure fund will come from additional income generated by its investments and will not affect the $400 million it already spends each year on supporting biomedical research—a sum nearly equal to the annual outlay of the Medical Research Council. The trust is already the world's largest single contributor to the human genome project—having committed $480 million to its sequencing facility, the Sanger Center, and the Genome Campus near Cambridge—and Dexter sees the new infrastructure program as essential support for these investments. "Sequencing of the human genome is only the first step in a process that is going to include the whole of the science base, not only the biomedical sciences but also engineering, informatics, computing, chemistry, and so on," he says. "To reach our goal of exploiting the infor-

mation emerging from the genome project will require the close interaction of all these scientific disciplines, perhaps on a scale that has not been seen before."

That close interaction is evidenced by the trust's contribution to help the government build a high-intensity synchrotron radiation source. Once the playthings of physicists and chemists, synchrotrons are becoming increasingly important to biologists for unraveling molecular structure. By chipping in, the trust has ensured that a new synchrotron machine will be built. Britain currently has an aging synchrotron at Daresbury in northern England, but researchers have been pushing for a unique new high-intensity machine, dubbed Diamond. "A machine will be critical for resolving the structure of small molecules which make up living organisms and is an essential tool for structural biologists," says Dexter.

The government's plans have also calmed fears that it may be less concerned with supporting basic research than with the transfer of knowledge to industry to foster innovation—a theme constantly voiced by the previous government. According to Chancellor of the Exchequer Gordon Brown: "It would be shortsighted to ignore the health of the science and engineering base itself. That is why we need to invest now." Industry seems to agree with the government's strategy. Says a spokesperson for the pharmaceutical company SmithKline Beecham: "This new spending will make the U.K. a more attractive place for investment."

–NIGEL WILLIAMS

PALEONTOLOGY

Smuggled Chinese Fossils on Exhibit

The Jurassic-era bird fossil from China was a real find for the Miyazaki Prefectural Museum of Nature and History in southwestern Japan. The clay slab containing the remains of a *Confuciusornis sanctus* served as an important element in a new exhibit on evolution that kicked off the museum's reopening in May. But 2 months later, pride has turned to embarrassment after museum officials learned that the fossil had in all probability been exported illegally.

The Miyazaki museum is not alone. In response to a 5 July exposé on fossil trading in the *Asahi Shimbun*, one of Japan's largest daily newspapers, the Tottori Prefectural Museum also removed a *Confuciusornis* specimen from public viewing. The two museums, along with four others in Japan that have *Confuciusornis* fossils in their collections, are scrambling to get on the right side of a 1989 Chinese law that prohibits the export of such cultural and scientific treasures without proper certification. And the problem extends beyond Japan. The New Mexico Museum of Natural History and Science in Albuquerque is trying to verify the status of a *Confuciusornis* put on display on 2 July after a trustee purchased it from a local dealer. The same cloud may also hang over nine specimens acquired in 1996 by the Senckenburg Museum of Natural History in Frankfurt, Germany.

At the center of the controversy is a chicken-sized creature identified and named in 1995 by avian paleontologist Hou Lianhai of the Institute of Vertebrate Paleontology and Paleoanthropology in Beijing from a sample brought in by a local farmer (*Science*, 15 November 1996, pp. 1083 and 1164). *Confuciusornis*, thought to have lived more than 120 million years ago, is the second earliest known bird after the 150-million-year-old *Archaeopteryx* and the oldest to possess such modern characteristics as a toothless beak and the ability to fly. Although the species has considerable scientific value for the early evolution of birds, it is not involved in the debate over their link to dinosaurs.

Even so, there is an active market in *Confuciusornis* specimens, hundreds of which have been excavated from the rich fossil beds outside Sihetun in Liaoning Province in northeastern China (*Science*, 13 March, p. 1626). Philip Currie, dinosaur curator for the Royal Tyrrell Museum of Palaeontology in Alberta, Canada, estimates that up to 75% have been smuggled out of China, leaving a minority in the country for purposes of research and exhibition. The Japanese museums paid between $5000 and $15,000 for their specimens, and the Albuquerque benefactor purchased his for $18,000.

An official with the State Administration for Cultural Relics (SACR) in China says that the Japanese museum fossils should be considered smuggled cultural relics. "This is robbery," he says, adding that any country holding the fossils should return them. A press spokesperson says that SACR has never approved the export of *Confuciusornis* fossils, nor has it received any requests.

The Ibaragi Nature Museum appears to have been the first in Japan to purchase a *Confuciusornis*, in December 1993, although it wasn't identified as such until 1997 by visiting British paleontologist Paul Davis. Since then, Miyazaki, Tottori, and

Big flap. *Confuciusornis sanctus* fossils, like this one in Beijing, are being traded in apparent violation of Chinese law.

city museums in Osaka, Aichi, and Okayama prefectures have all obtained similar specimens. The museums typically dealt with Japanese dealers, who are themselves intermediaries in the alleged illicit trading.

Japanese scientists and museum officials say that the current incidents reflect their ignorance of the Chinese law. Prefectural and city museums often have only one or few curators in geology, says one Japanese paleontologist, and it is rare for them to be fossil specialists. "It is almost impossible for them to understand the details of Chinese domestic law regarding fossils," he adds.

Several museum officials say they asked the dealers if the fossils were legal and were told not to worry, but none of the museums received documents gaining permission from the Chinese government to export the fossils. The dealer who sold the fossils to four of the museums, and who requested anonymity, says the fossils were mailed to him from China without any authorizing documents. Another dealer says that Chinese customs officials "have not requested any documents" during more than a dozen trips to bring home fossils.

None of the Japanese museums is currently exhibiting the fossils as they ponder

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