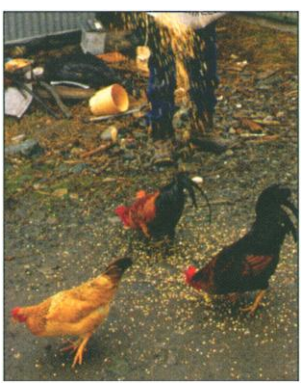
Path of Drug Resistance from Farm to Clinic

IN "LIVESTOCK FEED BAN PRESERVES DRUGS' POWER" (News of the Week, 4 Jan., p. 27), Dan Ferber discusses findings presented by Belgian researchers at a recent conference (*1*) indicating that the elimination of antibiotic use in animal feed significantly reduces the occurrence of drug-resistant bacteria in hospital patients. The main focus of the study concerned avoparcin and cross-resistance to vancomycin. Avoparcin was used in animal feed in Europe until such use was banned by the European Union in 1997. It is important to note that avoparcin has never been used in animal feed in the United States. The resistance to vancomycin in the United States is associated with human use of vancomycin, not with the use of avoparcin in livestock feeds.

Ferber also mentions that another animal drug, virginiamycin, is causing concern because of possible cross-resistance to a recently developed human drug, Synercid. Resistance to this class of drugs in human isolates is at a low level of about 1%, despite more than 25 years of use in livestock feeds. And if human resistance should increase, another even more recently approved human drug, Zyvox, that is in a different class is approved for treatment of vancomycin-resistant enterococci.



The European ban on some drugs used with livestock is allowing researchers to analyze if stopping such practices has human health effects.

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It is heartening to learn of the reversible cross-resistance of avoparcin and vancomycin in Europe that carries through from livestock to hospital patients. It remains to be seen if similar reversals occur with other antimicrobials, because not all are equal in this regard.

LYLE P. VOGEL*
American Veterinary Medical Association, 1931 North Meacham Road, Schaumburg, IL 60173–4360, USA. E-mail: lvogel@avma.org
*Director, Scientific Activities Division

References and Notes
1. Greet leven of the University of Antwerp and her colleagues presented their findings at the Interscience Conference on Antimicrobial Agents and Chemotherapy, held in Chicago, IL, 16 to 19 December 2001.

Response

VOGEL STATES THAT resistance to vancomycin in the United States is associated with the human use of vancomycin, not with the use of avoparcin in livestock feeds. This is in fact a point of debate. Although avoparcin was never used on U.S. farms, and vancomycin is used widely in U.S. hospitals, some experts maintain that vancomycir-resistant strains in U.S. hospitals arose first in Europe in response to years of avoparcin use on the farm, spread to the United States, then spread among U.S. hospital patients. Others maintain that vancomycin-resistant strains arose in U.S. hospitals in response to vancomycin use there.

DAN FERBER

Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 6 months or issues of general interest. They can be submitted by e-mail (science_letters@aaas.org), the Web (www.letter2science.org), or regular mail (1200 New York Ave., NW, Washington, DC 20005, USA). Letters are not acknowledged upon receipt, nor are authors generally consulted before publication. Whether published in full or in part, letters are subject to editing for clarity and space.

The New Hungarian Science Programs

JÓZSEF PÁLINKÁS, MINISTER OF EDUCATION in Hungary and chairperson of the Science Advisory Board of the new Science and Technology Policy Council, says in an interview for *Science*, "[Hungarian] Science has had a rough time, but we are on the right track now" (News Focus, "Money and political muscle help scientist turn the tide," J. Pickrell, 5 Oct., p. 40). I am a junior faculty member at the University of Debrecen in Hungary, where Pálinkás is a professor of physics, and I do not share his opinion of the current reality.

Recently, the funding of university science education was cut by 25% (*1*). Universities receive money from the government based on their number of students, and this is supposed to cover all expenses, including faculty and staff salaries. With such a large funding cut, all faculties of science in Hungary have come close to bankruptcy. The chemistry department in Debrecen has been forced to consider suspending student laboratory practices.

The description in the News Focus article of the upcoming increase in professors' salaries is misleading because the system on which salaries are calculated was changed in 2001. In the old system, the base salary depended on a number of factors, such as how long one had been a faculty member. The system also included allowances to acknowledge things such as language skills. With the new system, the salary depends only on position (full, associate, or assistant professor). Thus, although base salaries are indeed being increased, additional allowances have been completely abandoned, with the net result being little change, and in many cases a decline, in overall income.

What hurts professors much more is that the government cancelled the Széchenyi professorial fellowship, an initiative of the previous government, which provided renewable personal grants for the top 2000 university professors for 4-year terms. Its monthly amount ($1150 in 2001) was larger than the actual salaries, to which the grant was additional. Now a new fellowship is being introduced with a similar-sounding title, but that is for associate professors only and is very limited ($260 per month).

In summary, I think the image of the present situation of scientists in Hungary portrayed by Pálinkás is biased and flawed. There is a bitter joke among university professors: Salary increases tend to exist only in press releases, but never on paychecks.

GÁBOR LENTE
Department of Inorganic and Analytical Chemistry, University of Debrecen, H-4010 Debrecen, Hungary. E-mail: lenteg@delfin.klte.hu

References and Notes
1. Hungarian government decree 120/2000 (VII. 7.)

Response

LENTE'S COMMENTS DO NOT REFLECT ALL THE benefits of the new science and technology policy introduced just a year and a half ago in Hungary, and it is really too early to fully assess the effects. The first grants under the new National Research and Development Program have only just been awarded. Lente is partially right: Although far-reaching reform has started in the faculty members' salary system, the same figures might appear on the face of many university paychecks. The words "start," "might," and "many" are important here.

A science and technology policy is complex and cannot be thoroughly evaluated by just one component, namely, faculty paychecks. The National Research and Development Program is designed to promote the spread of high-tech industrial research facilities all over Hungary; the rapid development of information infrastructure; the establishment of new universities from an old, fragmented system; and a tripling of the number of university students in about 5 years, to name a few of the goals.

Lente focuses on only one aspect: the university paycheck story. A new way of financing research and higher education is under way; I mean new in Hungary and in the region, but industrialized countries have been using it for 40 to 50 years. We have now begun on an "industrial scale" the research grant system. The National Research and Development Program, by doubling the competition-based research funds, brings a new competitive approach and philosophy to the general research grant practice. Through writing project proposals, which are peer reviewed, and competing with others, sometimes from the same universities or even from the same departments, faculty who win grants will see their paychecks that are guaranteed from the "providing state" [i.e., the government (*1*)] increase. Think of it—in 2 years budgetary support for research and development will be increased by 61% nominally (some 50% at real value).

There is a lot of "new money" which is targeted at strategic goals, concentrated to key research fields, and available through competition. All these changes are happening in the best interests of Hungarian science to prepare our researchers for the bright but tough realities of the near future, namely, full membership in the European Union. Hungary is already a full member in the Union's research and development programs, but our researchers' ability to be competitive in writing research applications and winning grants from the EU (for Hungary to be a net recipient instead of a net donor to the system) has wide implications for us far beyond the field of research and development.

ISTVÁN SZEMENYEI
Advisor on International Science and Technology Affairs, Ministry of Education, Hungary. E-mail: istvan.szemenyei@om.hu

References and Notes

1. The term "providing state" has connotations from the period of Hungary's socialist political system, which ended abruptly in 1990, that go beyond the term "government" as perceived within a democratic system.

Photocatalysts Sensitive to Visible Light

BECAUSE OF THE POTENTIAL APPLICATION TO the conversion of solar energy to chemical energy, the development of semiconductor photocatalysts that have high reactivity under visible light has received great attention. Asahi *et al.* report that TiO_2 becomes a photocatalyst that is sensitive to visible light when it is sputtered or heated in a N_2Ar mixture (Reports, "Visible-light photocatalysis in nitrogen-doped titanium oxides," 13 Jul., p. 269). They ascribe this result to the doping of TiO_2 with nitrogen (N doping).

A similar phenomenon, not mentioned by Asahi *et al.*, was reported 15 years ago. When