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The future of the science doctorate goes under the microscope in this special issue of Science. And the most pressing question new graduates pose about that future, as illustrated in this image, is: Will I get a job? To adapt to a shrinking job pool, many are proposing Ph.D. population control, curriculum changes, and altering the research university in very basic ways. See the special News section "Careers '95: The Future of the Ph.D." beginning on page 121. [Illustration: Jody May]

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- SCIENCE (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1333 H Street, NW, Washington, DC 20005. Second-class postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 1995 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): $37; ($50 allocated to subscription). Domestic institutional subscription (51 issues): $228. Foreign postage extra: Mexico, Caribbean (surface mail): $53; other countries (air assist delivery) $93. First class, airmail, student and emeritus rates on request. Canadian rates with GST available upon request, GST #1254 88122. Printed in the U.S.A.

Change of address: allow 4 weeks, giving old and new addresses and 8-digit account number. Postmaster: Send change of address to Science, P.O. Box 1811, Danbury, CT 06813–1811. Single copy sales: $7.00 per issue prepaid includes surface postage; bulk rates on request. Authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that $3.00 per article is paid directly to CCC, 27 Congress Street, Salem, MA 01970. The identification code for Science is 0036-8075/95 $3.00. Science is indexed in the Reader's Guide to Periodical Literature and in several specialized indexes.
The U.S. science Ph.D. seems to have hit a wall—hard. After decades of expansion, the number of scientists seeking research grants and research jobs appears, in the eyes of many, to have outstripped the money available to supply them. Cell biologist Richard McIntosh, former president of the American Society for Cell Biology, has described the situation as a “Malthusian crisis.”

The first group to run into this harsh reality was physical scientists. With the shrinkage of the defense industry after the crumbling of the Iron Curtain beginning in 1989, there were fewer research jobs, says provost Mark Wrighton of Washington University in St. Louis. At the same time, the “biological revolution” of the last few decades had created a renewed surge of interest in the life sciences, says Ed Penhoet, chief executive officer of the biotech firm Chiron Corp. in Emeryville, California. The result: more people competing for fewer jobs. And attempts to reduce the federal deficit have reduced hopes for new growth in science budgets.

The effects of this changing environment are sweeping, and in this special issue of Science, we explore some of the most important features. Until now, says Karen Holbrook, vice president for research and dean of the graduate school at the University of Florida, Gainesville, “policies for graduate education, particularly in science and engineering, have not been seriously considered since the end of World War II.” But what began as complaints by jobless physicists has grown into a debate that is embroiling the entire community. Many favor curtailing Ph.D. production—and even those who don’t are talking about altering the curriculum to make Ph.D.s more marketable in a changing economy. Research universities, too, are changing, in ways that will affect the careers of scientists for years to come. (Early next year, Science will examine the changes affecting graduate education in Europe and Asia.)

Birth control. The major sign that things have changed in U.S. science is that some scientists—and some scientific societies, such as the American Chemical Society—are calling for reductions in the number of Ph.D.s being trained. The establishment—that is, scientists representing the National Science Foundation and the National Academy of Sciences—has been resisting calls for restrictions. Instead, the message, as spelled out in a recent report by the Committee on Science, Engineering, and Public Policy (COSEPUP), is that with a “broadening” of their train-

Small beginnings. One of the first U.S. graduate school classes gathered in the chemistry lab of Professor Ira Remsen at Johns Hopkins University, circa 1890.