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Breaking the age barrier

Many scientists continue to run productive and innovative research programmes well beyond typical retirement age. But in many countries, tough retirement laws make staying in the lab a challenge. Laura Bonetta reports.

When Jack Strominger and his wife moved to an apartment just a 15-minute walk from the lab, Strominger thought he would be able to do his reading and writing from home. Yet he rarely makes it out of the office before six in the evening. The head of a 14-member group at Harvard University, Strominger has an ambitious research agenda by any standards, but even more so because he turned 80 this month.

The immunologist is best known for his work with Don Wiley on the proteins that the body uses to distinguish its own cells from foreign ones. But these days, he enjoys applying his years of experience to new problems, such as autoimmune diseases. "My goal has always been to stay original," he says. "When I can't do that any more, maybe I will spend more time riding horses at our farm."

Eighty-year-old Janet Rowley, a cancer geneticist at the University of Chicago, has also toyed with the idea of slowing down. "I was thinking of going part-time but wanted to see what would happen to my latest grant," she says. "We got funding for another three years, so now I can postpone that decision." Rowley made her mark by discovering that pieces of chromosomes in cancer patients can break off and join on to other chromosomes. She had something of a late start in research, having worked as a clinician for several years and then as a part-time researcher while raising four sons. But she has more than made up for lost time. "I have had a front-row seat in a never-ending suspense story," she says.

Such tales are not unique. Many researchers continue to lead active and innovative research programmes in their 70s and 80s, quashing the notion that science is a young person's game. "Age matters, but not that much. And it matters less in the life sciences than in physics," says Paula Stephan. An economist at Georgia State University, Atlanta, Stephan co-wrote a book in 1992 called *Striking the Mother Lode in Science: The Importance of Age, Place and Time*, in which she examined the relationship between age and productivity based on publication record.

There may even be some advantage to age. "It can maybe help you focus on larger problems," says Joseph Gall of the Carnegie Institution in Baltimore, Maryland, who at 77 still works at the bench all day. "If you feel you have made your mark, you can sit back and look at the bigger picture. In a way that is what happened with our work on the Cajal body." First described more than 100 years ago, this cell structure was brought out of obscurity in the past decade by Gall's work showing that it is the assembly site in cells for key proteins that modify RNA molecules to make them function.

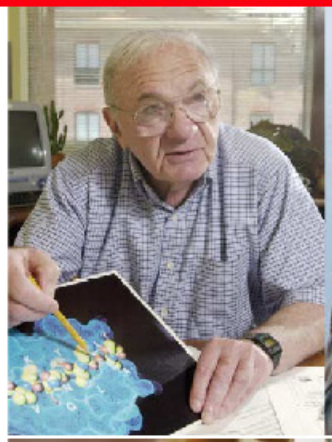
Generation gap

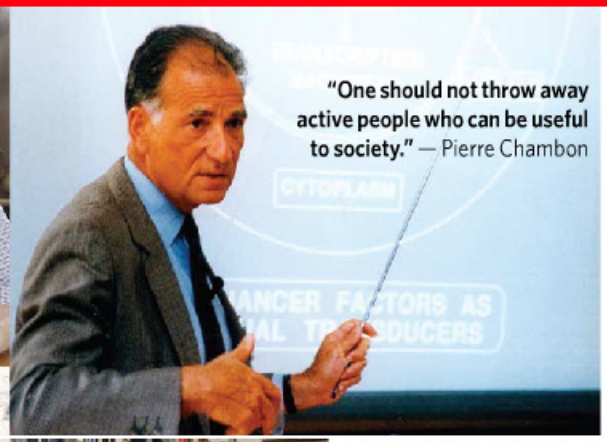
But there are drawbacks too. "It is definitely harder to recruit students and postdocs," says Strominger. "But it is understandable. My grandchildren are almost the age of my students. It is harder to relate to your grandfather."

Writing grants can also begin to get tedious after so many years. At 86, Herman Eisen, an immunologist at the Massachusetts Institute of Technology (MIT) in Cambridge, decided to let his last federal grant run out. "It was unrealistic to keep writing grants," he says. "For one thing, I had stopped taking postdocs because I could not commit to them for several years. And also on some level it felt embarrassing; I would be competing with former postdocs and students."

But Eisen is not out of work. MIT let him keep his lab space, where he continues to plug away at the bench aided by a part-time assistant and a succession of undergraduate students. "It is still very fascinating. The problems I choose today are precisely those that appeal to me a lot," Eisen says.

The lure of finding one more piece of the puzzle is what keeps thoughts of leaving research at bay for many ageing scientists. "I can't think of a day that I did not want to come to the lab. Maybe when my papers start getting rejected, I will start thinking about doing something else," says Gall.





I. CRAIG/HARVARD UNIVERSITY NEWS OFFICE (TOP); JANET ROWLEY (BOTTOM)

I. GALL

Willing workforce: (clockwise from top left) Jack Strominger, Pierre Chambon, Joseph Gall and Janet Rowley, who have all continued their research projects well beyond retirement age.

Scientists in the United States can continue working as long as they can get grants because the country did away with mandatory retirement in 1994. Australia, New Zealand and some provinces of Canada have followed suit. But in many European countries and in Japan, scientists working at government-funded universities have little choice but to retire sometime between the ages of 60 and 70, regardless of their level of productivity. As a result, the United States has benefited from the influx of several superstar foreign scientists trying to escape this fate.

Swiss Nobel laureate Kurt Wüthrich's move to the Scripps Research Institute in La Jolla, California, in 2001 caused a scandal in the European press. Five years before reaching retirement age, which is 65 in Switzerland, Wüthrich tried to negotiate a five-year extension to his appointment with the Swiss Federal Institute of Technology in Zurich. "But on very friendly terms, my request was denied," says Wüthrich, who will be 67 in October. As a result, he accepted one of the many job offers he had obtained abroad.

The situation quickly changed in 2002 when Wüthrich received the Nobel Prize in Chemistry. The Swiss parliament passed an extraordinary law to let him keep his post in Switzerland, although he had already set up shop in the United States. Wüthrich, who now splits his time between the two positions, says that the new law has not yet helped other Swiss academics.

Perhaps one reason for the resistance to change, suggests Wüthrich, is that senior scientists in Europe acquire many benefits that are difficult for universities to maintain if a scientist is not productive. "My chair in Zurich carried a non-competitive endowment for the salaries and consumables for a team of eight scientists and technicians. If I stop being productive at 55 but last my time until 65, this huge investment is not well used," he says.

Cold shoulder

Japanese scientists face a similar plight. "The system in Japan is considered to be based on achievement, but the reality is not so," says Yoshiaki Ito, who at 63 traded in his retirement from Kyoto University for a position at the Institute of Molecular and Cell Biology in Singapore. According to Ito, Japanese colleagues who want to continue working past retirement age have to scramble to find positions at private institutes or companies, or head abroad. "I never thought of stopping work. My work is going so well right now," says Ito, who believes he is hot on the heels of a genetic pathway fundamental to cancer. "To set a mandatory retirement age at 63 is cruel. It is like cutting your head off in the middle of your career."

In Germany, the situation is a little better, as retired professors can apply for grants, provided their home institution lets them have some lab space to continue working. But that too is far from ideal, according to immunologist Klaus Rajewsky, who left the University of Cologne in 2001 to take up a post at Harvard University. "The last years working in Cologne were often psychologically depressing. My colleagues, who were same age as I, were wondering how to deal with retirement. Some would talk about trying to get a place in someone else's lab to keep working," recalls Rajewsky. "I came to the United States and had a contract without a time limit and all those discussions came to an end. It was a relief."

"To set a mandatory retirement age at 63 is cruel. It is like cutting your head off in the middle of your career." — Yoshiaki Ito

R. ROLAKI, IGBMC STRASBOURG

Forced out

Scientists in Europe and Japan are sceptical about whether their universities will do away with mandatory retirement anytime soon. At the University of Tokyo, the decision to extend the retirement age from 60 to 65 by 2013 drew fire because many felt it would slow opportunities for new faculty appointments (see *Nature* **407**, 550; 2000).

The end of mandatory retirement in the United States had raised similar concerns, but Ronald Ehrenberg, professor of industrial and labour relations at Cornell University in Ithaca, New York, says they are misplaced. "The consensus is that people who would have retired before age 70 in the absence of mandatory retirement are continuing to retire, and of the people who were constrained by mandatory retirement, some are staying longer," he says. "People who stay past age 70 tend to be those individuals most driven by work and most productive, especially in sciences where you have a system in which you have to generate research grants to do your work."

Pierre Chambon, founder of the Institute of Genetics and Molecular and Cellular Biology in Strasbourg, thinks that judging a person by his or her age makes little sense. "Some people get old faster than others," says the biologist, who had to retire from the institute's directorship in 2002. "One should not throw away active people who can be useful to society."

This attitude is not unique to scientists. In May 2005, the UK-based HSBC Bank published a survey of some 12,000 people in ten different countries to gauge attitudes to ageing and retirement. The report, *The Future of Retirement*, claims that 80% of people worldwide want to scrap mandatory retirement, a trend partly attributed to the increase in life expectancy.

Chambon managed to find a way to keep working, albeit on a voluntary basis, by founding an institute that is affiliated with the University of Strasbourg but that operates in a semi-private way. "It's like telling someone who has always climbed mountains: 'Now, you cannot climb mountains any more, not even walk in the mountains'," says 74-year-old Chambon. "I am not pretending I can climb the peaks as fast as I did 20 years ago, but I still want to be in the mountains." ■

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