signed the letter—which will appear in an upcoming issue of *Parkinsonism & Related Disorders*—apparently agree: The letter congratulates the year 2000 award winners but states "that one prominent scientist … should have been included in this Award."

"We want to set the record straight," says neurologist Donald Calne of the University of British Columbia in Vancouver. Calne and others emphasize that the open letter is "not intended to slight" any of this year's winners, and they acknowledge that the committee that picked the awardees could only honor three people. (A spokesperson for the foundation said that they receive complaints every few years but are barred from discussing the selection committees' deliberations until 50 years have passed.)

Hornykiewicz, a still-active professor emeritus at the Brain Research Institute of Vienna University Medical School, reported in 1960 that the neurotransmitter dopamine is depleted in the brains of people with Parkinson's disease. He analyzed postmortem brains of people with a variety of neurological disorders and discovered that only Parkinson's correlated with low dopamine levels. "More or less immediately" after that finding, Hornykiewicz says, he proposed that replenishing dopamine could benefit Parkinson's patients. He convinced a neurosurgeon colleague to administer a dopamine precursor to Parkinson's patients "and saw spectacular results," he says—results they reported in a 1961 article.

Giving Parkinson's patients dopamine precursors is "still the best medication we have," says one drafter of the open letter, neurologist Ali Rajput of the University of Saskatchewan in Saskatoon. What's more, says Hardy, Hornykiewicz's approach to Parkinson's inspired similar neurotransmitter-based therapies for depression, schizophrenia, epilepsy, and other disorders.

Many of the letter writers and signatories are concerned that the Nobel announcement seems to attribute Hornykiewicz's insights to Arvid Carlsson of Göteborg University in Sweden. Carlsson's work, starting in the late 1950s, set the stage. He discovered that dopamine is a neurotransmitter and found that animals with movement disorders improved when treated with dopamine. But in describing Carlsson's accomplishments, the Nobel Foundation also states: "His research has led to the realization that Parkinson's disease is caused by a lack of dopamine in certain parts of the brain and that an efficient remedy (L-dopa) for this disease could be developed."

While expressing the "utmost respect and admiration" for Carlsson, Calne and others contend that the statement is "not absolutely wrong, but easy to misunderstand." Although the open letter doesn't make it explicit, some signatories suggest that the 2000 Nobel Prize should have focused more narrowly on the impact of neurotransmission research on treatments for neurological disease, and Carlsson and Hornykiewicz should have shared the prize.

Hornykiewicz says he's "very grateful" for the support. "That is one of the things that really count in the life of a researcher—the recognition of colleagues," he says.

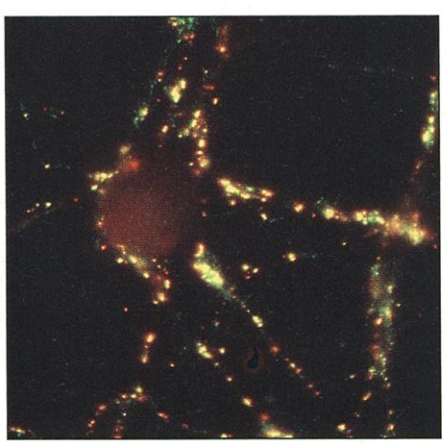
–LAURA HELMUTH

NEUROSCIENCE

Glia Tell Neurons to Build Synapses

After decades of neglect by researchers more interested in know-it-all neurons, brain cells classified as "glia" are getting some respect. Although glia account for 90% of the cells in the adult human brain, they've been written off as simple scaffolding that supports neurons, as sources of nutrition, or as a waste-disposal mechanism for sopping up extra ions and neurotransmitter molecules. But a new study on page 657 shows that glia play a more important role in neuron-to-neuron communication: They tell neurons to start talking to one another.

Before neurons can send and receive messages, they have to establish connections called synapses, points of near-contact where neurons swap chemical signals. How these synapses form is "a major question in neurobiology," says Robert Malenka, a neuroscientist at Stanford University who was not involved in the research. In the new work, Stanford's Ben Barres and his colleagues report that neurons can't build synapses very efficiently on their own. Young neurons contain all the raw materials necessary to do the job, but the neurons don't start construction until getting the go-ahead from nearby glial cells known as astrocytes.



Talk to me. Neurons grown near glia build more synapses (aglow).

The first indication that glia boost synaptic communication came in 1997, when

ScienceScope

Bioscheme The U.S. government is jumping into Biosphere 2, the giant greenhouse in the Arizona desert. On 18 January —2 days before leaving—Secretary of Energy Bill Richardson signed an agreement with Columbia University to examine the feasibility of making Biosphere 2 a Department of Energy (DOE) "national user facility." DOE will pitch in $700,000 over the next 2 years to help Columbia work up plans for a structure that failed its original test in the early 1990s as a self-sufficient home for Earth-bound econauts.

Scientists at Columbia, who took over the facility in 1996, have struggled to control gas levels and temperature in Biosphere's "biomes," including a minirainforest, ocean, and desert. The DOE agreement is evidence that Biosphere 2 "has proven itself" as a facility to study ecosystems' responses to climate change, says Columbia's Executive Vice Provost Michael Crow.

A DOE official says the department "is not prepared to start sending scientists to Biosphere 2 to do research." But the pact will allow it to explore whether the facility can complement ongoing studies of climate change, carbon sequestration, and atmospheric chemistry.

Headhunting A looming labor shortage has led some Canadian universities to spice up their hiring efforts. The province of Ontario is seeking $350 million for a recruiting drive, while Quebec is offering a 5-year income tax holiday to scholars who relocate to institutions within la belle province.

The Ontario Confederation of University Faculty Associations (OCUFA) recently estimated that 15,000 new professors—more than the number now employed—will be needed over the next decade by provincial universities to cope with retirements and a projected 40% jump in enrollment. Government budget cutbacks have already led to skyrocketing student-to-faculty ratios, says McMaster University political scientist and OCUFA president Henry Jacek. "The situation is bad and every day it gets worse."

But Jacek opposes tax holidays as a recruiting lure, saying they engender "animosity" within faculties and encourage professors to move away temporarily to be eligible for the break. He believes the long-term solution "is increased operating grants" from the government.

CREDITS: (LEFT TO RIGHT) E. ULLIAN; BIOSPHERE 2 CENTER

National research centers in the physical sciences—such as the GSI heavy-ion research group in Darmstadt and the DESY particle physics center in Hamburg—say their equipment is already being used extensively by scientists at universities and other German research institutions. GSI's scientific director, physicist Walter F. Henning, says that about 900 of the 1000 users of the heavy-ion accelerator come from outside the center, mainly from European universities.

Although Henning thinks that program-oriented financing is a good idea, he worries that Germany may not have enough experts on the federal payroll to make the system work. "Program-oriented research is the way to go," Henning says, "but administering it effectively requires a structure that doesn't yet exist in Germany." –ROBERT KOENIG

PLANT BIOLOGY

Xylem May Direct Water Where It's Needed

If plants are nature's architecture, the xylem is a lowly piece of plumbing. For decades, researchers have seen the xylem as a column of dead tissue, like a worn pipe, that sits inside plant stems passively supplying water to thirsty leaves. But a surprising new study suggests that the xylem is far more active than scientists have suspected.

In a paper published online today by *Science* (www.sciencexpress.org), Harvard University plant biologist N. Michele Holbrook, with postdocs Maciej Zwieniecki and Peter Melcher, reports that gels in key xylem membranes constantly shrink and swell. With this motion, the xylem actually adjusts the flow of mineral-rich water coursing toward leaves. "Researchers assume the xylem is a bunch of inert tubes, but it's not," remarks Holbrook. "It's actually a very sophisticated system for solving a plant's water-flow problems."

"This is the first good evidence I know of that the xylem regulates water transport in plants," says John Boyer, a plant biologist at the University of Delaware, Lewes. Bioengineer William Pickard of Washington University in St. Louis adds: "This idea just came out of nowhere, and it's an excellent paper."

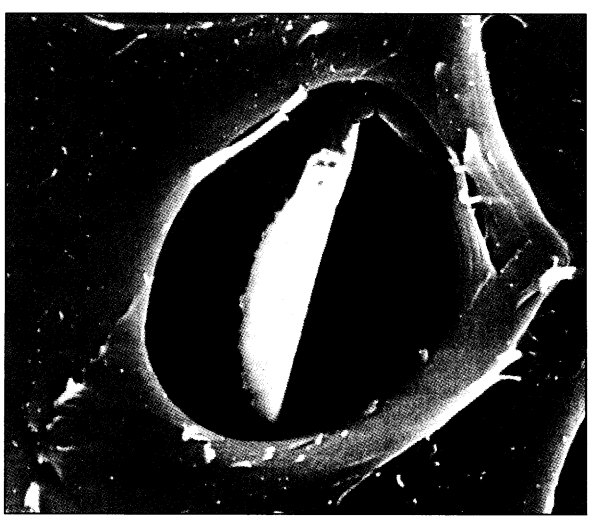
The xylem evolved millions of years ago, helping some primitive plants develop into higher vascular varieties—including angiosperms and conifers—that can survive on dry land. For much of the 20th century, researchers assumed the xylem had just two modes: on and off, or working and broken. More recently, they realized that the xylem frequently repairs breaks in its water column.

Last year, while researching xylem repair, the Holbrook team stumbled across the inspiration for their new study: a 1978 paper by Harvard biologist Martin Zimmerman. In that paper, Zimmerman's team noted that when they pumped tap water—full of everyday salts—into the xylem, it flowed much faster than deionized water. But why? The paper left the question open.

Maybe, Holbrook's group reasoned, the added salts somehow alter the xylem. To test that idea, the team cut segments of stems from laurel (*Laurus nobilis*). They tied a stem's downstream end to a tube that emptied into a cylindrical balance, measured over time. Then they fixed the upstream end to a small, pressurized tank. Using this setup, the researchers pumped water through the stem, steadily increasing the amount of potassium chloride (KCl). Sure enough, by the time the KCl concentration had increased from 0 to 50 mM, the water was flowing up to 2.5 times more quickly. Repeating the experiment with the salts NaCl, KNO_3, and $CaCl_2$, they found similar jumps in water flow.

What's more, the fast flow rates held when the researchers tested these solutions on 18 other angiosperms, five conifers, and three ferns. By contrast, when the team tried deionized water, the xylem's flow rate dropped considerably. Finally, they documented the same phenomenon in vivo, monitoring xylem uptake of salty versus deionized water in the split stem of a tobacco plant. "These changes were clearly due to some mechanical property of the xylem and the way it conducts water," Zwieniecki says.

Here they had a hint from industry: Engineers have shown that hydrogels, jellylike substances that can shrink and expand, influ-



CREDIT: M. ZWIENIECKI *ET AL.*

It's the pits. Water flowing up the xylem must cross ever-changing pit membranes like this one to reach thirsty leaves.

ScienceScope

Off the Hook ... Last week's transfer of U.S. presidential power brought good news for MIT chemistry professor John Deutch, former director of the CIA. Deutch was in the middle of negotiating a plea agreement with the Justice Department over his mishandling of classified data while at the CIA when Bill Clinton awarded him a last-minute presidential pardon. Deutch was stripped of his security clearances last August and was expected to plead guilty to a misdemeanor charge of keeping classified files on his home computer.

... And Staying On Meanwhile, NASA Administrator Daniel Goldin received another kind of reprieve: The new Bush White House accepted his offer to stay on as agency chief for a few more months until a permanent replacement is named. The list of possible successors to Goldin, who was appointed by Bush père, includes former astronaut and Senator Harrison Schmitt and Air Force General Pete Worden. And Charles Groat, director of the U.S. Geological Survey, has been spared the ax. "I very much wanted to continue and made that desire known," he said in a 22 January staff memo announcing his continued employment.

Animal Defense The United Kingdom wants to protect an ailing drug firm from animal-rights protesters. Last week the government pledged to help Huntingdon Life Sciences (HLS), Europe's largest center for animal experiments, with legislation banning protests outside employees' homes. The government may also outlaw mail threats.

For several years, employees of the Cambridgeshire firm have endured violent attacks and other abuse from protesters. Adding to the HLS's woes, activists recently claimed credit for triggering a financial crisis after pressuring a major financial backer to withdraw loans. To help out, U.K. Home Secretary Jack Straw plans to amend the Police and Criminal Justice Bill to clamp down on violent protest and spend $1.45 million to beef up security for HLS staff. U.S. financiers also stepped in to provide new financing.

Many scientists are glad that the government is acting but would like to see it do more. "These half-measures will do little or nothing to prevent the harassment," predicts Mark Matfield of the Research Defense Society, which represents scientists who experiment on animals. Protesters have vowed to continue their campaign.

Contributors: Gretchen Vogel, Wayne Kondro, Andrew Lawler, John Pickrell