AAAS

Diane Edwards reports from the American Association for the Advancement of Science (AAAS) meeting in Chicago

DOE official named new AAAS chief

When William D. Carey leaves his position as executive officer of the American Association for the Advancement of Science in April, his replacement will be Alvin W. Trivelpiece, currently assistant secretary for energy research in the Department of Energy. Trivelpiece, who has also held positions in academia and private industry, played a key role in obtaining presidential support for the Superconducting Super Collider project. The change in leadership was announced at last week's meeting by AAAS chairman Gerard Piel.

Nerve transplant: Proceed with caution

The use of transplanted nerve and brain tissue to cure neurological disorders has exciting clinical implications for treatment of illnesses such as Alzheimer's disease. But so many questions remain regarding their effectiveness and ethical issues that experimentation must proceed carefully, cautioned researchers gathered last week for a symposium at the annual meeting in Chicago.

Albert J. Aguayo of McGill University in Montreal emphasizes that nearly all neural transplant work thus far has been "pure experimental work. As far as I'm concerned, the applications . . . are far away from being directly relevant to clinical work." Aguayo and his co-workers have succeeded in connecting the end of severed optic nerves in rats to parts of the brain, using "bridges" of nerve from the peripheral nervous system — in this case the sciatic nerve of the leg (SN: 3/29/86, p.204). Long fibers, called axons, will grow from the eye along this bridge to the brain, reconnecting with cells in the brain.

In fish and amphibians, this nerve regrowth can actually restore sight. But complete restoration of function has yet to be demonstrated in the mammalian system, says Aguayo. However, he adds that, in more recent work by the McGill group, the measurement of electrical signals from regrown optic nerve fibers suggests that "some of these [cut] axons . . . are still capable of either retaining or regaining some of their normal function." Whether the observed "rewiring" will be sufficient to actually restore sight remains unanswered.

Another symposium participant, Victoria N. Luine of New York's Rockefeller University, reports that fetal brain cell transplants can restore normal sexual activity in laboratory rats, who exhibit abnormal sexual responses following the experimental destruction of certain areas of the brain controlling such behavior. Results of the study illustrate a troubling aspect of neural transplantation that is attracting attention among transplantation researchers. Ten weeks after transplantation, the graft apparently has lost its effectiveness, although the cells and their fibers remain in place.

This so-called "run-down" is being observed in other neural transplant systems, according to symposium organizer Roger M. Morrell of the Neuroscience Research Foundation in Southfield, Mich. A similar loss of beneficial effects was seen in the only known nerve transplantation work done in humans, reported in 1985 by a group of Swedish researchers.

"Almost all grafts run down after some time, through a reaction that does not seem to be the same thing as graft rejection (a type of immune response mounted by the host against the graft)," Morrell says. The cause of this loss of function — which would severely limit the usefulness of any graft procedure — remains a mystery. But an article in the Feb. 13 SCIENCE by Jeffrey M. Rosenstein at George Washington University in Washington, D.C., may provide a clue.

Rosenstein reports that transplants from fetal central nervous tissue have "permanent barrier dysfunction," which means that compounds carried in the blood can cross the blood-brain barrier. The barrier normally is very selective about which substances enter the brain (SN: 1/31/87, p.68). This "hole" caused by the graft exposes the entire brain to potentially deleterious agents.

It also exposes the field of neural transplants to more possibilities, according to Fred H. Gage from the University of California in San Diego. "[Rosenstein's report] opens up a new door for us [in terms of transplant study]," he says.

Despite the uncertainties and the controversy surrounding the Swedish study, Morrell predicts that neural transplantation studies will be conducted in human subjects within the next three or five years. Still, clinicians and researchers will have to dig deeper and ask some tough questions about risk versus benefit, says Gage, who points out that "in a sense, the cream has been wiped off the top of the neurotransplant field."

Strictly speaking, watch your mouth

Sweet nothings and fancy phrases are verbal niceties that flow from the human mouth. But the mouth also can harbor some nasty viruses, and oral lesions can be the first sign of serious illness. Because of increased concern over AIDS and herpes — and the possible viral causes of certain cancers — some scientists are calling for more vigilance on the part of dentists and other oral specialists.

Medical awareness among these specialists is particularly crucial in the case of AIDS, according to John S. Greenspan, chairman of oral biology at the University of California in San Francisco. "Since the beginning of the [AIDS] epidemic in 1981, it's been clear that the mouth is a very important location for the AIDS virus," he says. "[Oral lesions] can be the very first clinical sign of this infection." In an otherwise asymptomatic patient, these lesions can go unnoticed, says Greenspan.

In 1984, Greenspan first published the description of an oral lesion that was called hairy leukoplakia, a white lesion on the tongue or mouth floor often characterized by rough projections that look like hairs. It has not been found elsewhere in the body. The lesion joins Kaposi's sarcoma in the mouth, oral candidiasis and herpes simplex as another oral disease frequently found in AIDS patients.

Subsequent studies by Greenspan's group showed the viral lesion probably contains an unusual mixture of Epstein-Barr and papilloma viruses, both of which have been named as possible cancer agents. Late last year, the California researchers reported that hairy leukoplakia is also a sign of AIDS in high-risk groups other than homosexual men. They report having found such lesions in a blood transfusion recipient, a hemophiliac, a female partner of an AIDS-infected man, and a female partner of an AIDS-infected intravenous drug user.

Having established that the unique oral lesion is related to AIDS and that the majority of patients with the lesion have antibodies to the AIDS virus, Greenspan and his co-workers recently conducted a study to assess whether the lesion could serve as a predictor of the development of AIDS. The study subjects were homosexual or bisexual men with the lesion but without AIDS. Results of that study, to be published in the March JOURNAL OF INFECTIOUS DISEASES, indicate that an average of 48 percent of such patients will develop AIDS within 16 months and 83 percent within 31 months following appearance of the lesion.

Additional data from that study show that AIDS patients with hairy leukoplakia are much more likely to develop a specific type of pneumonia seen in AIDS than are patients in the general AIDS population. Also, those with small lesions are as likely to develop AIDS as those with lesions covering the tongue. On the basis of these results, Greenspan says hairy leukoplakia is "highly predictive" of later development of AIDS, and that medical personnel should be alert to its appearance in at-risk groups — which, he says, "means more or less everybody."