

But in practice, free hemoglobin molecules break into two, and sometimes four pieces when injected into the bloodstream without their red cell shell, and lose their ability to relinquish oxygen at the appropriate time. Several other research teams have developed alternative methods of cross-linking hemoglobin, in an effort to keep the molecule from falling apart, but most methods are not specific enough, says Reinhold Benesch. The resulting polymers vary too much in size and shape to be useful in oxygen transport, he says.

Hunt points out that some important physiological questions remain before the Benesch's compound is ready to be tested in humans, such as how it is broken down and how it is regarded by the immune system. Nonetheless, the work adds to accumulating evidence that modified hemoglobin may prove quite useful, he says.

"It's beginning to look," Hunt says, "like a modified hemoglobin may be the best candidate for an oxygen transporting system."
—D. Franklin

New fluoride study

Since 1959, fluoride emissions from the Reynolds Metals aluminum plant on the Gulf of St. Lawrence in Messina, New York, have rained down on Canada's tiny Cornwall Island, a part of the St. Regis Akwesasne Indian Reserve in the gulf. After the cows got sick, the bees left and pine trees started dying (SN: 7/19/80, p. 42), the island's several thousand residents began asking what might be happening to themselves. Results from a study seeking answers to that have just been released. Though "no indication of clinical illness was found to be associated persuasively with fluoride exposure," the 400-page report by Irving Selikoff and colleagues at Mt. Sinai School of Medicine in New York does recommend continued monitoring of those with high blood-fluoride levels.

While not alarmed by the study's findings, F. Henry Lickers, environmental director for the Mohawk reserve, says "We don't believe [the study is] a clean bill of health either." He says 40 or 50 islanders were found to have abnormally high fluoride levels in their blood. Another 17 symptoms — primarily respiratory, endocrinological and neurological — were positively correlated with the island's highest fluoride-exposure group, as were unusual blood-chemistry findings.

"[Mohawk] Chief Lawrence Francis has said that he doesn't believe our people should be guinea pigs to industry," Lickers told SCIENCE NEWS. Rather than studying the community for another 30 years, "We'd prefer the [Reynolds] plant be cleaned up." In 1980, the Mohawks filed suit against Reynolds seeking to force just that. And since the release of the Mt. Sinai study, Canadian officials have pledged to renew discussions with the U.S. government to resolve the pollution problem. □

Restrictions in DOD-university contracts

The fine print in research contracts between universities and the Department of Defense (DOD) has been a growing concern to many of the major research universities in the country. Especially worrisome are DOD requests for controls on publication and foreign participation in research that DOD labels as "sensitive." Yet, at the same time, university officials are faced with a rapid increase in DOD funding for university research.

For DOD, the issue is a matter of restricting the flow of sensitive technology to the Soviet Union (SN: 2/25/84, p. 117) while promoting research within the United States. "We want to slow them down and speed us up," a DOD official said recently. For university researchers, however, it means carefully considering what restrictions they are willing to accept in contracts with DOD.

The problem surfaced recently at Cornell University in Ithaca, N.Y. Cornell was unable to negotiate a contract with the U.S. Air Force because the proposed agreement contained publication restrictions and required DOD approval before any foreign national could work under the contract or gain access to data generated by the research. Cornell's Robert Barker, in a recent letter to John C. Crowley of the Association of American Universities in Washington, D.C., wrote, "In essence, we would have been required to perform secret research to be able to accept the contract under the conditions required by the agency."

Cornell electrical engineer Lester F. Eastman explained the other side of the dilemma. "This contract is quite important to me and my students," he said. "We have a patent disclosure submitted at Cornell on the device, and we have been pursuing it on a low budget for over two years. The support money in the contract [would have been] substantial — over \$450,000 total for the three years."

The topic of restrictions in DOD-university contracts was debated at great length last week in Washington, at a meeting of the DOD-University Forum's Working Group on Export Controls. Although the group, with representatives from DOD and several prominent universities, has been meeting for about two years, last week's meeting was the first held in public.

Current DOD proposals call for research to be designated "sensitive" or "nonsensitive." In the case of nonsensitive research, the investigator may submit anything for publication as long as the material is sent to DOD for review at the same time. If a particular area of basic research is designated sensitive, the investigator must allow 60 days for DOD to review the paper and suggest any changes. However, the investigator is still free to ignore the suggestions.

The category that has aroused the most controversy comprises the small portion of papers that falls under the "sensitive applied research" designation. DOD would like 90 days to study these papers and the power to stop publication.

The university representatives made it clear that universities would be very unlikely to accept DOD controls on publication. David A. Wilson, representing the University of California, said, "It's a mistake to expect any university to sign a contract that yields the right of approval." Instead, he suggested, DOD should rely on the "voluntary willingness" of researchers to protect sensitive information.

Gerald J. Lieberman of Stanford University noted that many university faculties have longstanding policies on refusing secret research and contracts with publication restrictions. He contended that Stanford and other major research universities faced with this situation would simply stop doing research for DOD. Edith W. Martin, deputy undersecretary of defense for advanced technology, replied, "How much money is Stanford willing to give up?"

Lieberman also pointed out that the government has always had the right to classify research papers as secret. DOD could still use this power, if necessary, during the 90-day review period. He suggested that only in the rare instances when the researchers and DOD disagree would the power of classification have to be exercised. "The frequency is so negligible it won't be an issue," Lieberman said. For this reason, a DOD "right of approval" does not have to be specified in a contract, he said.

Martin said she prefers a more constructive, less adversarial approach that would not "make the government an ogre." In addition, she said, classification is inappropriate for protecting work "on fleeting areas of research that are sensitive for a short time." At the moment, DOD has no system in place for effectively controlling this "sensitive" research. Previous controversial moves to impose controls at scientific conferences (SN: 4/2/83, p. 218), for example, were "actions in the absence of policies and procedures," Martin said.

After the discussion, Wilson commented that although considerable progress had been made, there was "some distance to go yet." The working group decided to work out an alternative wording for the DOD proposals that would be more acceptable to universities. This new draft may be ready for discussion at a meeting of the entire DOD-University Forum next month.

—I. Peterson