of test trials. A possible reason is that mixing the sentence types may force people to use exactly the same mental processes for comprehending each type. For example, see A. L. Glass and K. J. Holyoak, *Mem. Cogn.* **2**, 436 (1975).
32. One piece of evidence supporting the inference of shared processes is the relatively small difference in reaction times that occurred for the universal affirmatives and existential affirmatives concerning disjoint categories (Fig. 1); minimum $F < 1.0$ (5).
33. A similar view has also been expressed by other recent investigators. See B. Schaeffer and R. J. Wallace, *J. Exp. Psychol.* **82**, 343 (1969); E. E. Smith, E. J. Shoben, L. J. Rips, *Psychol. Rev.* **81**, 214 (1974).
34. Special provisions must be made for some idiosyncratic subsets that lack a defining attribute of their supersets, such as Japanese maples have red leaves rather than the customary green leaves of most trees. Smith *et al.* (*33*) have discussed how the attribute comparison process could be extended to handle these unusual cases.
35. E. E. Smith, L. J. Rips, E. J. Shoben, in *The Psychology of Learning and Motivation*, G. H. Bower, Ed. (Academic Press, New York, 1975). Our reasoning could also explain why participants in the experiment with existential affirmative sentences did not appear to use the attribute comparison process (*5*). When the participants had to decide whether it was true that SOME STONES ARE RUBIES, for example, they did not need to carefully analyze the relation between the designated categories. All of the false existential affirmatives involved unrelated (disjoint) categories. The presence of any close relation, that is, subset, superset, or partial overlap between the categories mentioned in a sentence sufficed for a "true" reaction. This may have allowed the participants to rely on a relatively superficial search and evaluation of paths in the semantic memory network (Fig. 3) without the later attribute comparison process.
36. We thank A. S. Coriell, K. D. Gutschera, J. C. Johnston, R. L. Knoll, T. K. Landauer, S. Monsell, E. Z. Rothkopf, and S. Sternberg for their helpful comments.

**NEWS AND COMMENT**

# NIH: Cancer Institute Politics Complicate a Difficult Case

On 15 September 1972, a boy named Teddy DeVita entered a small, germ-free room at the National Cancer Institute (NCI) in Bethesda, Maryland. Teddy had aplastic anemia. Unaccountably, his bone marrow had ceased functioning about 3 weeks before, which meant he was making no red blood cells, no white cells, no platelets. In the sterile room, Teddy would be safe from infection, to which he was suddenly very vulnerable. If he could be protected from bacteria and viruses, and supported by transfusions, his bone marrow might regenerate in time and start producing blood cells again, as happens occasionally in persons with aplastic anemia. At least, that's what was hoped the night Teddy walked out of what he calls the "real world" and into sterile isolation behind a plastic curtain and a shield of air.

His parents could see him, and they could talk to him over the low but persistent hum of the filtration system that kept contaminated air from blowing into his room. But they could not touch him. Teddy's father still remembers what a strange and frightening thing that was. "It was months," he says, "before my wife and I got used to the fact that we couldn't touch him."

Teddy DeVita was 9 years old the September night he checked into the NCI hospital, which is part of the Clinical Center at the National Institutes of Health (NIH). He is 13 now, and he is still there, in that same sterile room.

For 3½ years, Teddy has been studied by immunologists and hematologists who are interested in his bone marrow and blood. He has been studied by psychiatrists who want to know whether a young person can cope with prolonged confinement in a laminar flow room, so called because filtered air is introduced in horizontal layers. For all anyone knows, they may be studying him for another 3½ years of more.

The case of Teddy (Theodore) DeVita may turn out to be a classic in the annals of technology that gets ahead of man. Medical science can keep him alive but it may not be able to make him well. Recently a new element was introduced to the already complex situation—dirty politics.

Teddy is the son of Vincent T. DeVita, Jr., who, as director of the division of cancer treatment at NCI, is one of the institute's more powerful administrators. He is also a likely candidate for the job of NCI director should the incumbent, Frank J. Rauscher, Jr., leave in June as he has said he might (see box). Recently, some person, or persons, within the NCI decided to use the boy in what appears to be an attempt to attack his father and NCI policies with which they disagree.

In late February, a letter was sent to Theodore Cooper, the assistant secretary for health in the Department of Health, Education, and Welfare (HEW), alleging that a child at NCI had died because he was denied the special care that is being given to DeVita's son—specifically, the laminar flow room. "We are deeply troubled that these facilities developed and maintained at the public expense should be available by special privilege to the son of an NIH official, but denied to a dying child because his parents were of lesser influence," the letter declared. The letter was anonymous. However, the authors did acknowledge that they are NCI researchers who "participated" in the care of the child who died.

(A similar anonymous letter, alleging that the resources expended on Teddy were compromising the care of other children being cared for in the NCI's pediatric oncology branch, was sent to the parents of those children, who have joined together in a group called the "Candlelighters." The letter raised considerable anxiety among the parents whose children have leukemia. At a meeting with the Candlelighters, DeVita apparently persuaded them, at least temporarily, that the allegations are not true.)

It was days before Cooper finally saw the letter that was addressed to him. It seems that HEW, having a low opinion of anonymous authors, did not pass it on for his personal attention, but it did send a copy to NIH director Donald S. Fredrickson, who turned the matter over to the medical board of the Clinical Center. The board is inquiring into three specific questions—Was Teddy's admission to NCI proper? Should he be discharged? Was some other child deprived of treatment?—but, as Fredrickson points out, it may also take this opportunity to consider broader issues about the use of high technology in future situations. The board is also taking up the serious issue of the relationship between physicians and the families of the desperately ill children for whom they are caring. There is some reason to think that, in addition to the anonymous letter, some disgruntled staff members have been airing internal problems with the parents.

As to the specifics of the DeVita case, there is little reason to think that the medical board will find any impropriety, although there is no denying that the circumstances of his son's illness have cast Vincent DeVita in a sensitive and difficult role.

The first question on the medical board's agenda—whether Teddy should have been admitted to NIH—goes to the heart of the institutes' policy of restricting the Clinical Center to research patients. From the hospital's beginning in the 1950's, NIH leaders sought to insulate the Clinical Center from political pressures that could distort its mission. As one longtime NIH clinician put it, "We didn't want this hospital to become a place where congressmen or White House people could come to dry out or have their gall bladders removed at the taxpayers' expense." The ground rules for admission to the Clinical Center are strict. You must have a condition that someone there is studying and you must be willing to be the subject of research. Once a patient has been accepted for a study, care is free. Few would anticipate a medical board finding that Teddy De Vita was admitted to NIH for the wrong reasons.

When Teddy became ill in September 1972, his father was head of NCI's medicine branch, a position roughly equivalent to being a full professor in academic life. DeVita is a chemotherapist with a reputation for being one of the best in the business. Among other accomplishments, he is credited with refining drug therapy for Hodgkin's disease, a lymph system malignancy, to the point where Hodgkin's is now on the very short list of curable cancers.

As a clinician with vast experience in treating patients whose bone marrow is malfunctioning—as is the case with virtually all cancer patients, either because of the disease itself or because of the drugs or radiation being used to fight it—DeVita was well able to recognize signs of serious disease when they appeared in his son. Teddy had become extremely pale and developed petechiae (small red spots) on his skin. Petechiae result from hemorrhaging, which can occur if an individual's platelet count is low (it is the blood's platelets that are responsible for clotting). DeVita feared that Teddy might have leukemia or aplastic anemia and took him to researchers in the NCI's pediatric oncology branch, where both diseases were being studied. Bone marrow examination confirmed a diagnosis of aplastic anemia of a type with the worst prognosis.

At the time, an investigator named Ronald Yankee was studying the possibility of supporting patients with platelet transfusions over long periods of time and was having apparent success with a couple of individuals. Research in that area had been started at NCI several years earlier by a group of scientists that included Emil Freireich. DeVita remembers it: "Freireich began experimenting with platelet transfusion at a time everybody *knew* you couldn't transfuse platelets, but that didn't stop him."

During the late 1960's the science of immunology began to bloom, and researchers learned the importance of genetic matching, as understanding of the HLA (human leukocyte antigen) system grew. One can give unmatched platelets for a short time, but if one wants to support a patient for a long time, platelets must come from a donor whose HL-A type is close to that of the recipient. A child with aplastic anemia was an ideal candidate for studies of long-term transfusion and Yankee took Teddy into his research program. At first, the plan was to treat him as an outpatient, but he developed an infection and had to be hospitalized. As one of his doctors, Arthur Levine, recounts, "It was clear that long-term transfusion support was not possible unless the risk of infection could be reduced."

It happened that Levine was particularly interested in "protected environment studies" and in July, just weeks before Teddy got sick, had completed a study of leukemia patients in laminar flow rooms. In these rooms, a bank of high-efficiency filters at the head of the patient's bed cleans air that flows through them in horizontal layers, moving from the patient's head, across his body, and out. While it is not a 100 percent bacteria-free environment, it is, Levine explains, the next best thing. Whereas a conventional hospital room might have 10,000 bacteria per unit of air, there would be only 200 bacteria in the same unit of air in a laminar flow room.

Levine's study of leukemia patients proved that laminar flow is good for reducing the risk of infection, but that it does nothing for leukemia. The disease is progressive and, if physicians cannot limit the disease itself, there is no measurable advantage to keeping a patient infection-free in a sterile environment that is psychologically stressful and financially costly.

The laminar flow–leukemia study was terminated and attention was directed to other sorts of patients. Levine was think-

## NCI Director Set to Leave

National Cancer Institute (NCI) director Frank J. Rauscher, Jr., has declared that he will resign unless he can be assured of a pay raise by 1 June. Rauscher, who makes $37,800 a year, says it is not enough to keep him any longer now that two of his five children are in college and a third is about to matriculate.

Rauscher's kind of financial problems are not uncommon at NIH. The top paid people invariably make less than they would working for academia or industry and, as has been happening for the past few years, they may go for reasonably long periods without even a cost-of-living increase if Congress puts a lid on maximum salaries. Scientists often stay for years despite economic drawbacks because of loyalty to NIH, bred by a good environment in which to do research. But for many, the time finally comes when the lure of substantially more money on the outside becomes too powerful to resist, as it does especially when sending children to college is involved.

"I've asked my family to sacrifice for years," Rauscher has said, "so that I could stay at NIH." (He has been there, as a scientist, then an administrator, for 12 years.) He does not feel he can ask them any longer.

And so, Rauscher plans to leave—unless Congress passes special legislation that would give him, the director of the National Heart and Lung Institute, and the NIH director salaries up to $65,000 a year. Financier Benno C. Schmidt, chairman of the President's Cancer Panel, is lobbying hard to keep Rauscher, for whom he has considerable respect, and there is some support in Congress for an appropriate amendment to be tacked on to some veto-proof health bill. But whether there is enough support to get such an amendment passed is not certain.

Were such an amendment to pass, it would set the heads of the big cancer and heart programs even farther apart from the rest of the NIH institute heads, who already see themselves as the junior partners in what they would like to be a society of equals. There appears to be no move to extend the proposed raise to top NIH staff generally. Nor is there any reason to think such a move would stand any chance of succeeding.—B.J.C.

ing about individuals with solid tumors or aplastic anemia when Teddy came along. Levine and Yankee consulted with others in the NCI and with hematologists nationwide before recommending that Teddy be put in a laminar flow room. It was expected that one of two things would happen. Either Teddy would get better, or he would die.

DeVita discussed the matter with Yankee and remembers him saying that Teddy might have to stay in laminar flow for a couple of months, at the extreme, maybe a year. The DeVitas agreed to try it. No one considered that there might be a third outcome. No one dreamed that Teddy would be in that room for 3½ years.

One therapeutic tactic that researchers take in aplastic anemia is bone marrow transplantation. But that requires a donor who is immunologically identical to the recipient, and there is no such donor for Teddy. So his physicians have been trying a variety of other approaches to stimulating his dormant bone marrow. Sometimes androgens work, so he has been getting them. Sheldon Wolff, at the National Institute of Allergy and Infectious Diseases, has been studying the effect of an agent called etiocholanolone, etio, for short, on bone marrow and agreed to experiment with it on Teddy. But so far, nothing has worked.

### Brief Signs of Recovery

For a time in 1974, it looked as though Teddy might be on his way to recovery when he started making a few white cells, but after several months he lapsed back into almost total aplasia. Most recently, doctors tried to jolt his bone marrow into action by giving him ALS (antilymphocyte serum). Researchers in Europe had reported some advantages to using ALS on patients prior to giving them a marrow transplant and, in the past year or so, it has been tried a handful of times in this country. In one case, Harvard hematologist David G. Nathan, who is one of the principal outside consultants on Teddy's case, decided to experiment with ALS on an aplastic patient of his whom he was planning to transplant. That patient's marrow regenerated before the transplant ever took place, raising the possibility that ALS itself had stimulated the bone marrow. Teddy's doctors at NCI decided to see whether ALS might do the trick for Teddy. They obtained some of Nathan's supply and gave it to Teddy in February. It nearly killed him. He developed serum sickness from the ALS and went through a few rough days as his physicians struggled to pull him through. It was during that crisis that the anonymous letter was received.

The pediatric oncology branch of the cancer institute, whose staff is responsible for Teddy's care, was once regarded as one of the more progressive, innovative laboratories in the field. But it has been troubled by internal strife for the past decade—long before Teddy became a patient—and its scientific reputation has slipped. Researchers with strong personalities on the staff have clashed repeatedly, and leadership has been poor. When DeVita was promoted from head of the medicine branch to head of the division of cancer treatment, the pediatric branch came under his control. Virtually every senior staffer urged him to make changes and he, aware of the branch's long history of strife, agreed. He tried to recruit a new branch chief from outside NIH and, when that did not work, looked to the existing staff. There were two candidates for the job, each of whom said he or she could not work for the other. Last June, DeVita selected Arthur Levine to head the branch, and gave him the go-ahead to recruit young researchers to strengthen its scientific base.

It was clear from Levine's first act as chief that he intended to change priorities. Almost 90 percent of the branch's budget, he says, supported bone marrow transplantation studies that were anything but successful. Of 50 patients, there was only one long-term survivor, a poor record compared to those of other centers. Levine declared a moratorium on marrow transplantation until the situation could be evaluated. The branch would keep its commitment to patients already scheduled for a transplant but would take no new ones, he decided, in a move that was, not surprisingly, unpopular with part of the staff.

From here we go to the allegation in the anonymous letter that a patient died because Teddy DeVita had exclusive access to laminar flow facilities. The patient was not named in the letter but, as best as researchers can reconstruct the situation, he was a child with aplastic anemia under the care of Sheldon Wolff, the allergy institute researcher who was giving Teddy etio. The child was desperately ill and Wolff had been consulting authorities nationwide about his case. Physicians in the pediatric oncology branch offered to give the child a marrow graft as a last ditch effort to save him. It was discussed with Wolff and with the child's parents. But before there could be a transplant, the child would have to be cured of severe infection and kept infection-free until the transplant had taken place. The transplant researchers wanted to put him into a laminar flow room—perhaps the one kept as a backup for Teddy. Wolff recalls that they told him they would speak to Levine about using the room.

At that point the situation became clouded by the fact that persons involved had different ideas about what was going on. Levine, having initiated the moratorium on the transplant program, interpreted the request for a laminar flow room as one for an open-ended commitment and the possibility that another child might, like Teddy, be stuck in one indefinitely. He said no to the use of the room because, as he would later write in a memorandum for the medical board, "short-term laminar flow room isolation was not rational in aplastic anemia since taking the patient out of the room before recovery would be analogous to taking a viable patient off a respirator and that long-term isolation of a child should not again be undertaken until the experiment with Theodore DeVita had reached a successful conclusion."

The transplant researchers told Wolff of Levine's refusal to OK use of a laminar flow room and Wolff subsequently spoke to Levine directly about it. As Wolff recalls, he told Levine that he did not want his patient to have an open commitment to the room, that it was to be used only for a week or two prior to the transplant. Levine, surprised, said he knew nothing about an offer to transplant and told Wolff about the moratorium on marrow transplantation that had already gone into effect. Wolff began to wonder what was going on.

Even without the obstacle of the moratorium, the proposal to give the Wolff patient a marrow graft posed a difficult medical problem. There was no compatible donor, and nothing but anecdotal word from Europe that it had ever been done successfully. Nevertheless, the researchers in the pediatric oncology branch were willing to try it, using the child's mother as a marrow donor. Wolff was not sure whether he wanted to go along. He consulted with Nathan at Harvard, where the child had been seen previously, and Nathan warned him against it. He had already tested the mother's cells in a sensitive assay known as mixed leukocyte culture, which is thought to be an even better index of compatibility than HL-A, and found the mother's and son's cells reacted strongly to each other. A transplant would almost surely be rejected, he advised Wolff. Shortly after these conversations, the issue became moot—the child died.

Wolff concluded from all this that he and his patient had been used by mem-

bers of the pediatric oncology branch who wanted to keep their transplant program going. His anger at the situation was heightened because the patient's family had been given false hope about a transplant. He fired off an angry memo to DeVita recounting the events. Written last July, before the present controversy, it stands as an important part of the record the medical board is examining. Wolff is adamant in saying that the decisions made about his patient had nothing to do with Teddy DeVita.

What will come of all this remains to be seen, but some things can be said. It is all but certain that DeVita will be vindicated by the medical board, which will find that Teddy's admission to NIH was proper, as was the decision not to put another child in laminar flow. It is also certain that neither the medical board nor anyone else is going to say that Teddy should be discharged from his sterile room.

Were he to leave his isolation, he would probably be dead of overwhelming infection within a couple of weeks. Because he is extremely bright and creative, his doctors say, he has been able to survive the psychological stress of his terrible isolation remarkably well. Although at times he becomes angry or depressed, psychiatrists who have followed his course closely say that is a perfectly normal way to cope with such a predicament. But they also say he has become more and more depressed lately as he contemplates the future. He has, on occasion, threatened to just get up and walk out, and he has said he will not stay unless the doctors continue to try new things to get his bone marrow functioning again.

Teddy's admission to NCI came at a time when cancer researchers were optimistic about progress in immunology and chemotherapy that had been made during the late 1960's and early 1970's. It was a time when chances of successful treatment of cancer and related diseases such as aplastic anemia seemed to be getting better and better. But progress has not come fast enough and Teddy DeVita is caught in the middle.

His is an enormously complex difficult situation. There is, as far as is known, only one that parallels it. In Houston, Texas, there is a child, born with combined immunodeficiency disease, who has lived all of his life in a protective bubble while scientists try to find a way to get his bone marrow working. That child has long been referred to as "Baby David," but he is no baby any more. How long can someone stand to live in a bubble or a sterile room? No one knows. "Baby David," now about 5 years old, is too young to make a choice about it. But Teddy DeVita, mature beyond his 13 years, is which must make his young life even harder.

—BARBARA J. CULLITON

# National Forests: Court Ruling Spurs Clear-Cutting Controversy

Congressional hearings in March opened the way for another noisy chapter in the continuing national controversy over timber management in the national forests. Pressures for congressional action stem from a federal appeals court decision last August that brought clear-cutting in the Monongahela National Forest to a grinding halt.

The decision confirmed a lower court ruling in favor of the Izaak Walton League and several other conservation organizations, which had sued to stop some proposed timber sales by the Forest Service. The sales were found to be in violation of the Organic Act of 1897, a long-ignored law that forbids the sale and cutting of immature trees. The findings in the case were subsequently applied in another suit over clear-cutting in the Tongass National Forest in southeastern Alaska.

The timber industry has been horrified by the decisions—it has been claimed that if they applied to national forests across the country, logging would be reduced by 40 percent. Now that the Organic Act, which was passed at a time when forests were being rapidly and heedlessly decimated, has been brought back to life, Congress is busily seeking ways to resolve the dilemma. And environmental groups are using the crisis to push what they believe are long overdue reforms in timber management in national forests.

The court, in the Monongahela decision, acknowledged that the Organic Act might be "an anachronism which no longer serves the public interest," and there is little disagreement that its proscriptions are much too crude to be appropriate in these days of modern silviculture. It prohibits the cutting of any but dead, matured, or large growth trees, which essentially means a prohibition against clear-cutting—a respectable technique when applied in moderation—since most stands contain some young trees.

The debate is not simply one between timber interests and lovers of wilderness, but also reflects very real differences among foresters on how to raise productivity without doing violence to other forest uses, and over the degree to which management practices should be spelled out in legislation. The differences are reflected in three pieces of proposed legislation that have been the subject of joint hearings held in mid-March by the Senate agriculture and interior committees.

One bill, introduced by the two Alaska senators, Mike Gravel and Ted Stevens, seeks to buy time for a solution by putting a 2-year moratorium on enforcement of the court decisions. Another, introduced by Hubert H. Humphrey (D–Minn.), contains a great deal of language about getting the Forest Service to promulgate new standards and guidelines, and contains a provision that would amend the offending portion of the Organic Act. The most controversial bill is S.2926, the National Forest Timber Reform Act of 1976, introduced in the Senate by Jennings Randolph (D–W.Va.) and in the House by George Brown (D–Calif.). This bill, if passed, would be the first major piece of legislation regulating timber management since the Multiple Use–Sustained Yield Act of 1960. That act seeks to ensure that timber growth keeps up with tree sales, and sets forth the principle that equal consideration be accorded to six forest uses: rangeland, wildlife, watershed, timber, recreation, and beauty.

The importance of the Randolph bill in the eyes of environmentalists may be indicated by the fact they have put together one of their single-purpose coalitions for the occasion, in this case the