intelligence scale would be the *wrong* instrument to use in assessing the efficiency of such a program and, further, that the use of such an instrument is likely to lead to erroneous conclusions about the program's efficiency. Even more serious is the possibility that, by using the wrong instrument of evaluation in a large number of programs, one would erroneously conclude that intervention in general is ineffective in improving intellectual ability, thereby supporting the view that environment is ineffective in modifying intelligence. There are few who would suggest that schoolchildren should be administered a standard intelligence test after, say, a course in geography. Yet, such a procedure would be analogous to using an intelligence test to measure the success of attempts to teach the object concept to infants. Clearly, the success of a geography course is best assessed by tests of geographical knowledge and understanding; by the same token, the success of a program stressing sensorimotor skills is best assessed by specific tests of sensorimotor ability. In both cases, there may be some instances of improvement in intelligence test scores, but such improvement has to be regarded as fortuitous.

It cannot be emphasized too strongly that the success of specific intervention programs must be assessed according to specific criteria related to the content of the program. By focusing attention upon the criteria for evaluating programs, the necessity for careful specification of the program's goals will be emphasized. As argued above, the failure to specify goals has been a contributing factor in the confusion over means of evaluating intervention programs.

The nature and structure of infant intelligence is a complex and, as yet, unsolved problem. In our search for social relevance, we must not be misled into thinking that the worth of our efforts can be determined solely by the magnitude of infants' scores on intelligence tests of demonstrably limited generality.

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NEWS AND COMMENT

Grant Termination: Scientist Wins $16 Million for Loss of Support

John Julian Wild is a scientist who, by his own account, has fallen on hard times more than once during his career. One of those times was the winter of 1964, when a grant he had from the National Institutes of Health (NIH) was terminated because his sponsor, the Minnesota Foundation, withdrew its support. Wild's grant, which had been approved for 4 years and a half million dollars, came to an end after only 18 months. Eventually, Wild sued the foundation, its parent organization —the Amherest H. Wilder Foundation —and Frank M. Rarig, Jr., for $48 million. (Rarig was an administrator of both foundations.) Late last month, at the conclusion of a 6-week trial in a district court in Minneapolis, a jury awarded Wild a whopping $16 million in compensatory and punitive damages. The defendants will appeal.

Now Wild is suing the Department of Health, Education, and Welfare (HEW), asking that it release information about himself that he believes to be in HEW files. The two cases have set official nerves on edge. Nobody yet seems to know just what the Wild cases may mean as far as the possibility of future suits by other investigators is concerned. The question of whether this is a unique situation or one that may prompt similar actions simply cannot be answered now.

Wild discussed his career as a scientist and some of his attitudes about research in a lengthy telephone interview with *Science*.

A naturalized citizen who is British by birth, Wild, a physician, came to the United States shortly after World War II to work in the department of surgery at the University of Minnesota, where, he said, he was supported by a 2-year fellowship from the U.S. Public Health Service. "Then, afterwards, there was nothing further for me there [at the department of surgery]," he recalled, adding that, although Owen Wangensteen, who was chairman of surgery, tried, he "couldn't find me any more money."

John Julian Wild "fell on hard times." He says that he did not want to return to London to face the state of chaos that research was in in postwar England. Nor was he sympathetic to Britain's introduction of socialized medicine. So he looked for resources around Minneapolis, where he was, and still is, living.

In London during the war, Wild became interested in the bowel. He tells of seeing vast numbers of patients whose bowels were paralyzed by hemorrhaging caused by the effects of bomb blasts. The condition can be lethal. "I solved the problem," Wild said, "by developing a tube to relieve bowel distension." It was at this time

that he came to Minnesota to work with Wangensteen on the problem of postoperative bowel paralysis. "My primary objective," Wild recounts, "was to measure the thickness of the human bowel." He proposed to use sound waves to do it.

Although his affiliation with the department of surgery ended sooner than he might have wished, Wild found a spot at the university in the department of engineering. To his considerable satisfaction, he discovered that, at a Naval air station near Minneapolis, there was a radar trainer that no one was using. The device had a frequency of 15 megacycles, which was just right for his work, and, Wild declares, "Nobody seemed to object to my using it." So he used the Navy's equipment to bounce sound waves

H. Allen Smith Jet Propulsion Lab—or What's in a Name?

Thanks to an obscure act of Congress, the California Institute of Technology's renowned Jet Propulsion Laboratory will henceforth be known as the H. Allen Smith Jet Propulsion Laboratory, an honor that the retiring California congressman for whom it has been renamed humbly describes as "beyond my remotest dream . . . one I never would have believed possible."

The folks at JPL—or HASJPL, as it will officially be known after 4 January—never imagined that it was possible either. And by all indications, they are not nearly as delighted with the change as is Representative Smith, a 16-year Republican House veteran whose district encompasses the Pasadena laboratory. While most officials at Caltech and JPL have restricted themselves to a curt "no comment," random inquiries to laboratory staff elicit reactions ranging up the scale from neutrality to outrage. "An insult to technology" is the way one engineer put it. Students at Caltech, for their part, got up a petition protesting the change and suggesting that, if JPL had to be named for someone at all, Congress would do better to start with the astronauts who "have given their lives to man's effort to explore space."

With news of these reactions filtering back to Washington, Smith's new honor is rapidly turning to ashes, and a staff aide says he's very embarrassed by the whole affair. "It wasn't his idea," said Alice Anderson, who wrote the congressman's press release announcing the laboratory's new name. "He isn't that kind of man."

Underlying the objections to renaming JPL is the impression that Smith's contribution to the aeronautical and space sciences is not of the magnitude that ordinarily merits enshrinement in a leading center of interplanetary research. A lawyer and former FBI agent, the congressman's closest association with aerospace came in the late 1940's when he served as the Lockheed Aircraft Corporation's manager of security. During his years in the House, Smith distinguished himself as a quiet, unwavering conservative dedicated to economy in government. To that end, he voted against the supersonic transport and on at least three occasions opposed the space authorization bill, the ultimate wellspring of JPL's money.

It turns out, however, that the chief qualification for memorialization in a federal building is death or retirement after long service in government, and not what one has done for the occupants inside. It may also help to have a friend on the House Public Works Committee, which has jurisdiction over federal buildings, and which last year decided that it had fallen behind in its duty of honoring departing, or departed, colleagues.

The instrument for remedying this oversight was a little-discussed bill authorizing construction of the Dwight D. Eisenhower Memorial Civic Center in Washington, D.C. The committee merely attached riders to the bill naming federal buildings from Vermont to Hawaii after 34 former senators, representatives, judges, bureaucrats, and one Hawaiian prince—Jonah Kuhio Kalanianaole, who served as a territorial delegate to Congress around the turn of the century.

Buildings to be so honored, a committee staff member explained, were selected by asking the General Services Administration (the federal landlord) which government edifices in each honoree's home town or district were not already designated as memorials. The Jet Propulsion Laboratory was the only one in Smith's district, the staff member said. (Except for a building temporarily housing an office of the U.S. Geological Survey in Sioux Falls, South Dakota, the rest were ordinary office buildings and courthouses.)

No one asked JPL, Caltech, or the space agency what they thought of the idea, but the committee did check with the chairman of the House Science and Astronautics Committee, George P. Miller (D–Calif.), and he approved. Actually, Miller was not in a position to object gracefully. He, too, is retiring, and the Public Works Committee decided to affix *his* name to the federal building in Oakland, California.

Committee staffers profess not to have heard the complaints from Pasadena, and anyway, said one, the decision is irrevocable: "It's a law and the President signed it."

To try to smooth things over, Smith sent off a "Dear Bill and Harold" letter on 13 November to William Pickering, the director of JPL, and Harold Brown, the president of Caltech, explaining that the name change was as big a surprise to him as it was to them. Smith also pointed out that "there are many laws on the federal books which are not enforced" and said he was sure that no federal agency would try to enforce the use of his name if the laboratory really objected. Last week Smith was still waiting for a reply.

Meanwhile, JPL has done nothing in the way of ordering new stationery or changing its telephone listing, and a close reading of the law suggests it really might not have to do anything to comply. The law, PL 92-520, merely says that any future reference to the laboratory "shall be held as a reference to" the H. Allen Smith Jet Propulsion Laboratory. But there is no explicit requirement that the laboratory advertise itself as such.

In the end, the solution may be for JPL to acknowledge its new name with a small sign behind a fast-growing evergreen and let time take its course.

—ROBERT GILLETTE

through dog bowels. He was so "amazed" at its ability to measure the thickness of the tissue that he "moved on to cancer" and studied the ability of sound to distinguish normal tissue from malignant. He discovered, he says, that cancerous tissues send back more sound than normal ones, that "there is a natural contrast." He looked for cancers of the stomach, brain, and breast and predicted that ultrasound would prove to be a valuable tool for finding inpalpable lumps. He won a prize for an exhibit on the potential of sound that he presented at a state medical society meeting and continued to look for major support for his research.

By 1952, his experimental use of ultrasound had progressed well, and he published an article in *Science* [**115**, 226 (1952)] in which he discussed the "Application of echo-ranging techniques to the determination of structure of biological tissues." In it, he expanded on ideas he had presented in specialty journals in the two preceding years.

Between 1954 and 1960, Wild was associated with St. Barnabas Hospital in Minneapolis, and during that time, with grants from the National Cancer Institute (NCI) and the National Heart Institute (NHI), he continued to work on his machine, the "echograph" that would detect breast cancer in women. Throughout this period, he said, he occasionally had troubles with officials at the NCI. "The NCI was not happy with my work," he declares. He objected to the NCI's "insistence" that his results be verified in double-blind studies by other investigators and contends that NCI arguments that his data were insufficient to support his hypothesis were unfair because, at that time, his equipment was still in need of technological refinement.

In 1960, he left St. Barnabas "under a cloud," following disagreements about the way in which he should be conducting his research. Again he "fell on hard times." In the several years that he had NCI and NHI support, Wild estimates that he received at least $250,000, but always "in small, single doses." He said he "scounged" gifts from industry for his research and, personally, was making about $9000 a year in those days.

His association with the Minnesota Foundation began in 1960, when it agreed to act as the conduit for private funds. Wild's lawyer, James M. Williams, reports them to have been modest. Then, in 1962, it looked as though finally things were going to get better. The National Institute of General Medical Sciences (GMS) was a fairly new part of NIH. "It was meant to give some leeway," says Wild, who won a $500,000, 4-year grant from GMS under the institutional sponsorship of the Minnesota Foundation. His purpose, he says, was to develop new methods of detecting disease with a minimum of inconvenience to the patient, methods that used physical processes to give clinical indices of disease. Perfection of his echograph machine for early breast cancer detection was of paramount importance.

Wild to Create New Lab

According to Wild, under the terms of the grant, he was to set up a laboratory and pursue his research. The Minnesota Foundation would handle the fiscal side of life. Such an arrangement is common in government grants, which almost always go to individuals through an institution. (In fact, according to an NIH spokesman, grants directly to individuals are so rare as to be virtually nonexistent. Of the more than 15,000 grants out now, only six go to a researcher without passing through some fiscal agent.)

What happened during the time Wild was setting up his laboratory and launching his research project is not clear. Wild maintains that the foundation found him "difficult to work with," but says of their ultimate termination of sponsorship, "I felt their not liking me personally was hardly justification for abandoning my lab." His lawyer alleges that the reason the foundation wanted to drop Wild was that he was making progress, that there appeared to be every reason to think that once the echograph was in use it could be a highly profitable item, and that the foundation wanted to get hold of the machine for itself. These allegations, Williams says, were made during the trial. "They [the defendants], of course, never admitted it," he says.

William Luther is the attorney for the foundation, but, because there will be an appeal, is unable to discuss the case in detail. However, he told *Science* it would be fair to say that the Minnesota Foundation discontinued its support of Wild because it became "disenchanted with his project." Describing the activities of the foundation, Luther explained that it rarely administers research grants; rather, it is usually involved in charitable work for aiding retarded children, helping senior citizens, and the like.

According to scientists who have nothing to do with the Wild suit but who are familiar with him professionally, he was an important figure in the early days of ultrasound research. Said one, "Wild was one of the pioneers in the field." But this same scientist, who was a member of the study section that approved Wild for the $500,000 grant from GMS back in 1962, said, "Wild is the type of person who cannot live in a structure. Scientifically, he often goes off on tangents, but sometimes he comes up with a brilliant idea." Wild, himself, believes that a measure of freedom is essential to creative scientific research. "What people fail to realize," he says, "is that ideas come from single brains. Scientists need time to sit and dream. I like to think of this as what I call accountable freedom."

In his conversation with *Science*, Wild said that the reason he took his case to court was not simply because the foundation withdrew its support, but because it did so in what he considers a malicious and professionally ruinous way. He claims he has been unable to do any research since 1964. During the last few years, he has been practicing medicine. "I'm just lucky to have had a M.D. degree," he comments, adding that after his research project came to an end, he had to spend some time "retraining" himself for practice.

During the trial, Wild said, he "lectured to the jury for 2 weeks on my accomplishments," telling them about the work he believes he has done and what he thinks he might have done.

At the conclusion of the trial, he was awarded the $16 million on four separate grounds. According to Williams, the jury found the defendants responsible for "breach of contract" with regard to the Minnesota Foundation's agreement to sponsor Wild's research. They awarded the plaintiff $129,000. Further, they found that the breach of contract had been "in bad faith"—that it was broken "maliciously," in Williams's words. Wild won $1.3 million in compensatory and $825,000 in punitive damages on that score. Third, Williams says, the jury found that the defendants had interfered with Wild's existing personal and business relations. "They tried to keep him from doing research," is the way Williams summed

it up. Wild won $2 million in compensatory and $5 million in punitive damages for that. Last, he won equal sums in compensatory and punitive damages for "defamation of character." The attorneys for the defendants were unavailable for comment on these matters.

Wild, of course, does not have any of the money as yet. The jury's verdict has been stayed temporarily, pending an appeal. If and when he does get it, the 58-year-old scientist plans to go back to research.

—BARBARA J. CULLITON

Los Alamos Scientific Laboratory: Weapons Are Still the Focus

Los Alamos. Despite the central role that the Los Alamos Laboratory played in the effort to develop the atomic bomb, at the end of World War II the laboratory's future hung in the balance during the national debate over the future of atomic energy. Even with the formation of the Atomic Energy Commission (AEC) and the transfer of Los Alamos and other facilities from the Manhattan project to civilian control, there were those in Washington and elsewhere who doubted that competent scientists could be attracted to the remoteness of northern New Mexico. With the decision in 1947 to proceed on a massive program of nuclear weapons development, however, the renamed Los Alamos Scientific Laboratory (LASL) gained a new lease on life. Then, as now, nuclear weapons were LASL's main business.

In recent years, LASL has again entered a period of uncertainty about its future. Two cutbacks in nonweapons projects that were among the laboratory's major diversification efforts lowered morale among the scientific staff. Questions persist about the impact of a possible total ban on nuclear weapons tests and about the extent to which LASL will remain primarily a weapons facility or will diversify into other areas. A new director and some vigorous new projects are now providing an upbeat note, and there are signs that the laboratory may be about to embark on a period of renewed expansion, along with a gradual broadening of its mission. But the laboratory's prime responsibility and largest activity—like that of its sister laboratory at Livermore, California—is still the design, simulation, and prototype construction of new nuclear weapons.

Following the end of World War II, the laboratory at Los Alamos was rapidly reduced to a skeleton of its former self. With the detonation of the first atomic bomb at the Trinity test site some 200 miles south of Los Alamos on 16 July 1945, and with the bombing of Hiroshima and Nagasaki 3 weeks later, the original mission of the laboratory was completed and many of the original staff left. The laboratory was reformed with Norris Bradbury as director (see box) and by 1947 had begun the task of upgrading the crude, ad hoc designs of the wartime weapons into standardized devices for the nation's stockpile. Efforts to develop a thermonuclear, or hydrogen bomb, were begun and were intensified after the 1949 explosion of a nuclear device by the U.S.S.R. Dissatisfaction with the pace of thermonuclear research at Los Alamos led Edward Teller, one of the leaders of the H-bomb effort, to leave and help form a second weapons laboratory at Livermore. Research at LASL soon proved successful, however, resulting in the first thermonuclear test in 1952.

Bradbury continued as director of LASL until 1970, when he was succeeded by Harold Agnew, the present director. During this time, the laboratory grew slowly but steadily to its present size of about 4000 employees, including a scientific staff numbering over 1700. LASL's efforts were devoted primarily, but not exclusively, to weapons. Under Norris Bradbury, LASL soon developed a strong basic research effort that in the early 1950's accounted for about a third of the laboratory's budget. In those early years, the laboratory was given a relatively free hand by the AEC and by its military sponsors. The basic research, although largely supported by the weapons program, was viewed as a means of ensuring that high-quality scientists in many fields would be available at Los Alamos as a backup for the weapons work. Projects in physics, chemistry, computer science, metallurgy, and explosives were encouraged, and research was initiated on such problems as the effects of radiation on human health.

In addition to basic studies and weapons development, LASL's efforts in the 1950's were also applied to several nonweapons projects. The early diversification projects included work on nuclear reactors, controlled fusion (Project Sherwood), and the design and construction of a nuclear rocket (Project Rover). Work on nuclear reactors began on a small scale during the war and became a full-fledged division in the early 1950's, employing about 200 people at its peak. The Sherwood effort was smaller, although it attracted considerable interest in the scientific community when it, along with other controlled fusion projects, was declassified in the mid-1950's. Rover became a formal project in 1955 and received a big boost after Sputnik was launched in 1957. The largest nonweapons program at LASL to date, Rover in the mid-1960's accounted for about 15 percent of LASL's staff and about a quarter of its overall budget.

None of these attempts at diversification has led to a permanent broadening of the laboratory's mission, however. The reactor effort at Los Alamos was almost entirely canceled, and the reactor division disbanded, by the AEC in 1970. The Sherwood project, like other efforts to contain fusion magnetically, is still without notable successes, although the program is still active. The nuclear rocket program was effectively dismantled in 1971 by the Office of Management and Budget, leaving only residual pieces of the program at LASL. That the laboratory retained any of the program is at least in part due to the intervention of Senator Clinton Anderson (D–N.M.), a longtime supporter of LASL and an influential member of the Joint Committee on Atomic Energy who is retiring this year.

The cancellations in the reactor pro-