Cancer and the Mind: How Are They Connected?

The notion that the emotions are related to the onset and course of cancer is an ancient one. The 2nd-century physician Galen is said to have observed that women with melancholic dispositions seemed more inclined to breast cancer than those of a sanguine bent.

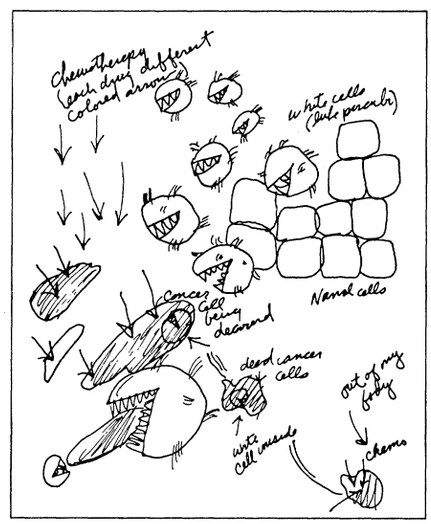
Scientists nowadays put little stock in such an idea. Nonetheless there is a modest body of research that tentatively links psychological stress and certain emotional characteristics to cancer.

Growing interest in the psychosomatic aspects of cancer is reflected in the publicity spurred by an epidemiological study of medical students begun in 1946 by Caroline Bedell Thomas of Johns Hopkins Medical School. Thomas used psychological tests given the students in medical school, plus yearly questionnaires about their health and living habits, to discover the precursors of five conditions: coronary heart disease, hypertension, mental disorders, malignant tumors, and suicide. She used cancer as a disorder that was presumably not related to psychological factors; but a "striking and unexpected" finding was that the psychological profiles of those who have developed cancer (48 as of last year) bore strong similarities to those who committed suicide. They were generally "low-gear" people, little given to expressions of emotion, whose relationships with their parents had been much more cold and remote than those of individuals who developed other kinds of diseases.

Other preliminary findings have recently been reported by Nicholas Rogentine, immunologist at the National Cancer Institute (NCI) who has found that among patients successfully operated on for malignant melanoma in stages I and II, patients who relapsed had tended to minimize the significance of their illness. This supports the theory that repression and denial is related to poor prognosis.

Interest in studies relating psychological factors and stress to cancer is growing apace. The NCI, for example, has recently funded several large epidemiological studies that are attempting to see whether psychological factors are predictive of the disease. A number of factors are contributing to this phenomenon. According to NCI's Bernard Fox new information on the immune system—particularly evidence that the hypothalamus has a major effect on its functioning—is opening the way for research that could link specific emotions to specific biochemical events. And the fast-blooming area of behavioral medicine provides a favorable context for these initiatives to flourish. Also, evidence supplied by research with biofeedback and behavior modification has demonstrated the extent to which the mind can influence physiological processes hitherto thought to be inaccessible to voluntary control.

Theories about psychological precursors of cancer cluster around several related notions—about "helplessness and hopelessness"; denial and repression of negative emotions, particularly anger; and inability to cope successfully with a severe emotional loss. Some of these ideas were explored in the years surrounding World War II when psychosomatic medicine was developing and psychoanalysis was enjoying its heyday in America. Rapid advances in biomedical research shifted interest away from these concerns.



This is the imagery of a woman taking chemotherapy, who had had two mastectomies. The sharp teeth of the white cells show "anger and hostility." Later imagery showed the cells as pirhana-like fish, interpreted as showing less anger and more purposefulness. [*From* Getting Well Again *(J. P. Tarcher, Inc. 1978).*]

Some Americans are now taking a new look at some studies that were conducted after the war in England and America. One of the best known researchers was internist D. M. Kissen of the University of Glasgow who did psychological studies of industrial workers (all of them smokers), comparing those with various lung ailments, primarily tuberculosis, with those whose diagnoses were subsequently found to be cancer. He found that cancer victims suffered particularly from denial and repression of their emotions—they had "poor outlet for emotional discharge," as measured by personality tests used to gauge "neuroticism." Cancer victims scored very low, which Kissen took to indicate low emotional lability. He believed that smokers who got cancer had different personalities from the general population of smokers, who tend to score high on neuroticism. He concluded that the more repressed the individual, the fewer cigarettes it took to induce cancer.

Cancers of breast and reproductive organs in women have also come under considerable scrutiny. Arthur Schmale of the University of Rochester 10 years ago set up a project to see if he could predict cancer through psychological means. With women who had suspicious cell changes in the cervix, he conducted interviews and administered the Minnesota Multiphasic Personality Inventory (MMPI). Looking for "hopelessness" and recent emotional losses, he predicted correctly in 36 cases out of 51 which women would turn out on further examination to have cancer.

A more recent study (1975) by S. Greer and T. Morris at Kings College Hospital in London found that inappropriate coping with anger—usually suppression, but sometimes extreme expression—was correlated with discovery of breast malignancy in women coming for examination of lumps.

Another oft-cited researcher whose work was done in the 1950's is William Greene, internist and professor of psychiatry at the University of Rochester. He tested patients with leukemia and Hodgkin's disease and found that "the manifest development of the disease occurred in a setting of emotional distress." In nine out of ten cases, he says, the time the disease develops is when a person feels alone, helpless, and hopeless.

A recent study has added to the sparse existing data on whether emotional states affect the prognosis once patients are diagnosed with cancer. At Johns Hopkins Medical School Leonard Derogatis, a psychologist, and oncologist

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Martin Abeloff surveyed 35 women with breast cancer. They found that the women who expressed a high degree of anger toward not only their disease but their doctors lived longer than those who were pliant and cooperative. Arbitrarily setting 1 year as the dividing line for survival, the doctors found that the women who were good at "externalizing negative affects" did better even though that group, had, if anything, a poorer prognosis than those who succumbed quickly. "I was cynical about there being any difference," says Derogatis, but it did appear that the fighters had a better chance.

A pioneer in the field of cancer and personality is New York psychologist Lawrence LeShan. LeShan is pretty much a lone wolf, and is regarded as something of an extremist even by those who respect his ideas. Nonetheless he is perhaps unique in the degree to which he has been involved with the emotional lives of cancer patients. LeShan conducted a study lasting from 1952 to 1964 of more than 400 cancer patients (the only major types of cancer he did not encounter were those of blood and lymph, he says), using various psychological tests and interviews. In addition, he did more than 100 hours of psychotherapy apiece with 71 of the patients. He found that 72 percent of the patients had suffered the loss of a central relationship in the period ranging from 8 years to a few months prior to the onset of the disease—compared to 10 percent in a control group of people in psychotherapy for other reasons. And, unlike the controls, most of the cancer patients evinced a profound sense of "despair"—feelings of futility and isolation that were beyond emotion—that he claims they had lived with for many years before they got ill.

Currently, Klaus Bahnson, a psychologist and psychoanalyst at Eastern Pennsylvania Psychiatric Institute, is one of few researchers to be studying cancer from a predominantly psychoanalytic viewpoint. He has proposed a theory of

Briefing

U.S. Semiconductor Lead Threatened, Officials Say

Oscar Wilde's disdain on seeing the wonder of Niagara Falls ("It would be more spectacular if it flowed the other way"), resembles that of the Department of Defense (DOD) in criticizing the U.S. semiconductor industry—which since 1970 has revolutionized myriad civilian and military activities—for not moving fast enough.

Specifically, a study conducted for the DOD by the Rand Corporation concluded that the United States is unlikely to move as rapidly as other countries at the cutting edge of the technology, which is to make a single silicon chip perform many more complex calculations than it can today. Both the Advanced Research Projects Agency (ARPA) and the Office of the Undersecretary for Defense Research and Engineering are considering sponsored research programs to do this, on the argument that industry, by and large, is not addressing advanced DOD needs.

Since the late 1960's, the mass production of these silicon chips has made possible many things, from precision weapons to real time imaging by reconnaissance satellites, to the ubiquitous pocket calculator.

But other countries such as Japan, coming later into the game, could in the future produce superior devices because they would begin with a more advanced technology base. Meanwhile, the U.S. industry may have too heavy a capital investment in existing techniques to be willing to convert to the new ones. "It's like General Motors' reluctance to convert its production plants to building compact cars," says one Defense official. Some officials are even of the opinion that Japan's technology in the field is already superior to ours, but this point is debated.

The Rand study, conducted for ARPA, surveyed the U.S. industry and found that industry officials were planning only incremental improvements in semiconductor technology in the next decade or so.

The amount of brains a chip has, so to speak, depends on the density of the pattern of wires, switches, and logic that can be mass printed on the tiny chips. At present, on a single silicon wafer 4 inches in diameter, it is easy to print tens to hundreds of chips.

Using light beams to write on the wafers, U.S. industry now prints lines from 3 to 5 micrometers wide. An advanced chip, today, might have 10,000 gates, or switches, on it which perform the and-or, yes-no, on-off logic functions.

By the 1980's, officials say, the industry, using ultraviolet light beams, may perhaps move to tracing narrower lines, as low as 0.5 micrometers wide. As a result, far more circuits could be added to a single chip, making it "smarter" in a sense.

(When first introduced, the mass-produced chips were considered revolutionary if they had as many as ten gates on a chip.)

But ARPA information processing expert Robert E. Kahn would like to see the industry—and if not industry then the research community—try for feature sizes a quantum jump smaller. Perhaps, with the use of electron-beam, x-ray, or focused ion-beam methods, lines could be drawn that would be 0.1 micrometer wide, and this drastically reduced size could permit from 1 to 25 million gates on a single chip.

Kahn notes that this would raise many major uncertainties and problems. One would be the limit of the materials themselves; such narrow lines, conducting electricity, could be chemically unstable. Silicon itself, may not be the best chip material under these circumstances. Another problem is that of designing the architecture of the chips, he says. A single human designer can now work out the functions for a 10,000-gate chip; but a computer will have to enter the process if a million or more gates are involved.

One dramatic advantage of these improvements, Kahn and other experts say, is greater speed. If the curcuits are smaller, they can operate faster and at lower voltages. Both may be important advantages in a number of applications.

White House to Study Industrial Innovation

The White House has launched a 13-agency study of industrial innovation in the United States and of ways the federal government can work to improve national industrial productivity. The study will take 14 months to prepare policy recommendations to the President, according to a plan now circulating among the agencies and authored by the President's special assistant for domestic affairs, Stuart Eizenstat. It appears to be a broader, more formalized version of an examination of

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"complementarity" between somatic and emotional disorders: in some people, he believes, irresolvable conflicts may build to the extent that the only way out is psychosis, while in others, cancer is the ultimate route. In a test in which cancer victims and others were asked to assign adjectives to various neutral sounds (a sort of auditory Rorschach test), he found that cancer patients used more benign and positive adjectives than did others. This was construed as evidence that cancer victims are more likely to repress negative emotions.

The kinds of investigations cited above hold considerable attraction for psychologists and psychiatrists but they do not even begin to take into account the differing etiologies of different kinds of cancers, or the vast range of genetic, environmental, viral, age-related, and other factors that have been identified with cancer. Omitted from any of these studies is an attempt to identify mediating mechanisms—immunological or endocrinological—that might translate emotions into neoplasms. And as Fox pointedly remarks, in a lengthy paper discussing the problems of research in the field, psychological examination of people who already have cancer (whether or not the diagnosis is known at the time) is almost tautological. "To the researchers who claim to have shown differences between cancer and well patients, I say that you are all probably right." Says Fox, "Cancer patients *are* different." But the psychological differences may be ascribable to hormonal changes associated with the disease.

Therefore, what is needed, on the one hand, are biochemical studies linking immunological and hormonal events to particular emotions; on the other hand is a requirement for data that can only be gained through long-term prospective studies of large populations.

The NCI in 1975 issued a request for proposals on projects related to personality, stress, and cancer. Two studies were funded as a result.

Briefing

the problem that has been going on for the last year in the office of Frank Press, the Science and Technology Adviser to the President.

Among the concerns is "increased private-sector R & D emphasis in recent years on low-risk, short-term projects directed at incremental product changes, and decreased emphasis on the longer-term research that could lead to new products and processes." This is alleged to be a trend in several industries, including even the semiconductor field where the United States is thought to be a world leader (see briefing on p. 1364).

Lack of venture capital to small firms, low productivity in manufacturing, and increased imports of certain classes of basic goods will also be examined. Finally, the plan will look at one of the favoriate gripes of industrial leaders, namely, that federal regulation is throttling the R & D budgets and high-risk inventiveness of U.S. industry. The Eizenstat memo, however, phrases this problem more delicately, saying the study will examine "The changed direction of industrial innovation in recent times resulting from the diversion of corporate effort from developing new products to meeting other social goals."

In launching the study, the Carter Administration is borrowing a leaf from the book of the Republicans who preceded him. Under the Nixon Administration, former supersonic transport advocate William M. Magruder led such a "technology initiatives" effort from the White House. President Ford appointed a pair of blue-ribbon committees, one chaired by industry magnate Simon Ramo, the "R" of TRW Inc., and the other headed by William O. Baker, of Bell Telephone Laboratories, that looked at these problems, among others. What is not clear is whether the Democrats can implement corrective policies, in what will be the third year of the President's term, that will make much of a difference.

Colorado Professor Fired over False Accounts

Eugene Haas, a sociology professor at the University of Colorado, has been fired after a committee of his peers found that his conduct "fell below minimum university standards of professional integrity." Haas was charged with having falsified travel vouchers so that he could use National Science Foundation (NSF) grant funds to pay for a female associate to travel with him to Hong Kong on a vacation.

For the first time in campus history, the Faculty Privilege and Tenure Committee recommended the firing of a tenured professor, indicating that at the hearing held to adjudicate the case, Haas' version of the story just didn't wash with his fellow professors. Haas had already pleaded guilty in U.S. District Court, he said at the time, not because he was guilty but to avoid more serious felony charges. The matter had become a federal case because NSF money was involved. Over the years, the NSF awarded Haas more than $2.65 million in his university capacity and as president of his private firm.

The faculty committee's report concluded that to forgive Haas for falsifying the documents (another witness testified that a completely false itinerary for his companion was drawn up and submitted to the university, exactly equal to what it cost to go to Hong Kong), was to say that auditors, rather than the faculty, are responsible for the financial integrity of university activities.

"A system of meticulous University oversight into details of research activity could pose a threat, ultimately, to freedom of the individual investigator.

"Complete honesty in the documents submitted to the University is an indispensible element in the preservation of that freedom . . . [A]sking faculty members not to file false documents is one of the least exacting demands that the institution can make on its faculty."

Off the record, some university colleagues of Haas say that what was most aggravating about the case was his continued denial that he had done anything wrong. He never admitted to having falsified the documents—although the travel agent contradicted this, and when confronted with such testimony he continued to maintain his innocence. "I've seen other people in similar situations" one person on the university staff told *Science* "who just admitted what they had done and were contrite about it. But he didn't." Haas testified at the hearing held by the faculty committee that in the period after the Hong Kong trip, he had been under great emotional stress and had forgotten to pay back the university for the travel of his companion.

The NSF is completing a final audit of Haas' activities. The foundation has declined new proposals for research that Haas had submitted to NSF before he was fired. Haas could not be reached at his home or office to discuss the decision or his future plans.

Deborah Shapley

One, conducted by Ralph Paffenbarger of Stanford University, is looking for occurrence of cancer and heart attacks among two groups of male college graduates—36,000 who entered Harvard between 1916 and 1950, and 14,000 who entered the University of Pennsylvania between 1931 and 1940. All the men had psychological tests in college and have been filling out periodic questionnaires about health, jobs, habits, and so forth. Paffenbarger hasn't completed analysis of his data, but he says "My guess is there is no relationship between psychosocial factors and the risk of getting cancer."

The other study is headed by Richard B. Shekelle, epidemiologist at Rush Presbyterian-St. Luke's Medical Center in Chicago, who is looking at psychological data obtained from 2107 workers at a

The Plight of the "Deinstitutionalized" Mental Patient

Since 1955, when psychotropic drugs began to replace straitjackets and locked wards for psychiatric patients, an estimated 1.5 million long-term residents have been released from American mental hospitals. The exodus has swelled in recent years, now that "deinstitutionalization"—supplemented by community mental health centers—has become the dogma of the mental health establishment.

Under the banner of "community-based care," perhaps 250,000 mentally and emotionally disabled persons are now in nursing homes, boarding houses, residential hotels, subsidized apartments, group homes, and halfway houses.

Sensible as that may sound, it hasn't been working out very well. For it seems no one gave very careful thought as to what would really happen to these mental patients once they were on their own. They all have a roof of some kind over their heads, and the means to acquire food and medical care if they are well-organized enough to do so. But for most the concept of "community care" is no more than a sad joke. Very few of these people are being systematically looked after by anyone; programs supplying vocational training, guidance in self-care, recreation, or simple opportunities for socialization are few. A large proportion of them (the figures are very blurry) have been placed in poor, crime-ridden areas that hardly qualify as "communities." And the real communities don't want former mental patients around.

The President's Commission on Mental Health, which issued its report in April, said that the "stigma" attached to the mentally ill was the largest single obstacle to rehabilitation of former mental patients.

The reasons for this stigma, and what might be done about it, were the focus of a national conference held in May in Washington, D.C., sponsored by the Horizon House Institute of Philadelphia. Called "The Community Imperative," it drew some 450 people to figure out how to persuade communities to be more accepting of former mental patients. "The situation is getting out of hand in many cities," noted Tom Bryant, chairman of the presidential commission. "Retrenchment is being demanded in area after area." Because of community resistance, the number of halfway houses has remained almost static over the past decade. "It has been estimated," said another speaker, "that for every community program that is established and in operation, another has been prohibited or closed because of community opposition."

Perceived "dangerousness and unpredictability" of former patients are cited as the main reasons for public aversion. Television and the press took a drubbing at the conference for conveying the impression that to be mentally ill is to be a homicidal maniac, whereas such studies as there are indicate that former patients do not appreciably increase the crime rate—they are far more often withdrawn and fearful.

Aside from their misconceptions about mental patients, many people find it emotionally unsettling and aesthetically distasteful to be confronted with the sight of disheveled people engaged in bizarre if harmless behavior. This problem is aggravated by the fact that groups of patients are often clumped in one area resulting in what might be called oversaturation. A woman from the Dupont Circle Citizens Association in Washington complained, for example, that 1500 former patients from St. Elizabeths Hospital had been relocated in her neighborhood. "We don't like it, and we are not going to have it," she proclaimed. People don't like having their parks taken over by patients who have nowhere else to go, or their local McDonald's "jammed with repulsive mental patients."

In happy contrast was a case history related by Geoffrey Greene of the West 87th Street block association in New York City. When 130 released patients were relocated in a hotel on the block, the association (representing an upper middle class neighborhood) set up a committee to help integrate the newcomers with the rest of the neighborhood. They obtained the services of several social workers to help the residents adjust, set up a lunch program for them, and persuaded the hotel to contribute recreation rooms; members of the community contributed furniture, clothes, books, and money. Now, says Greene, patients participate in social events and activities of the block association, and the whole community has found the exercise so therapeutic that "it has improved 200 percent."

Unfortunately, most communities with this sort of togetherness exercise it to exclude rather than integrate mental patients.

Many suggestions on how to improve community attitudes were bandied about at the conference. Much of it was PR: public education, programs to "sensitize the media," the introduction of new euphemisms (James Mancuso of the State University of New York at Albany proposed that former mental patients be thought of as "ceremony violators," so as to conceptually divorce their unorthodox behavior from its stigma-riddled cause.)

As for strategies for introducing patients into communities, the general feeling seemed to be that trying to sneak them in in "low profile" fashion was likely to backfire, and the best course was to get community members actively engaged in decisions right from the beginning. Although improvements in services and programs, better planning in site selection, and more training of community workers were seen as necessary, the concern always returned to public education. Until public attitudes are changed, said Bryant, "I suspect very little more will happen" in social integration of the mentally disabled.—C.H.

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Western Electric Company plant who were tested several times between 1958 and 1962. Eighty-two of the men, who are now between 60 and 75, had died of cancer by 1975. Shekelle expects the final tally to be about 300. Relying mostly on the MMPI, he is looking for correlations between cancer and two psychological states: depression, and denial and repression.

The only other related extramural NCI grant that *Science* learned of was to Frances Cohen of Langley Porter Neuropsychiatric Institute, who is looking at the role of early childhood factors in cancer and heart disease. She is using data from two detailed longitudinal studies—the Berkeley Guidance Study and the Oakland Growth Study—begun when the subjects were children. They are now middle-aged and haven't developed many diseases yet. Cohen is skeptical about the theories on loss, repression, and denial. Her hypothesis is geared to uncovering the relation of life stresses to the availability of emotional supports.

So far, the evidence linking emotional states with specific hormonal states, and the hormonal activity with specific immune functions or with direct action on tumors, is sparse indeed. The study of malignant melanoma patients by Rogentine of NCI includes the collection of immunological and endocrinological data for an integrated psychological-physiological profile of those patients in whom the disease recurs, but he doesn't have any results yet.

Several studies have been cited that contribute little fragments to the biochemical picture. John Mason, neuroendocrinologist at Yale, found that levels of a certain adrenocortical hormone (17-hydroxy-corticosteroid) were raised in the mothers of leukemic children. He has also found it raised in the urine of Army recruits who had lost their mothers, although it was lowered among those who lost their fathers. He concluded there was an interaction between parental loss, one's psychologic defenses, and one's hormone level—although the complexity of the matter is obvious from the fact that different kinds of loss were associated with different hormonal reactions.

Another researcher is Vernon Riley of Pacific Northwest Research Foundation, who has conducted two novel studies with mice. In one, he concluded that high levels of corticosteroids lower immune function, because, when he injected the animals with a corticosteroid antagonist, immune function was restored. In the other study he found that mice injected with mammary tumor virus developed tumors much more quickly in a stressful atmosphere (where adrenal output increased) than in a protected environment.

In a unique study with humans, J. W. Bartrop of the University of New South Wales in Australia found function of T cells (part of the immune system) significantly depressed in 26 people, aged 20 to 65, who were grieving over the loss of a spouse.

Clearly, it's going to be a while before biochemical research establishes the role of the mind in precipitating cancer, or of that ill-defined but potent factor—"the will to live"—in mobilizing physical defenses once the disease has set in.

Nonetheless, for a growing cadre of people involved in the psychological treatment of cancer victims, the evidence, while not definitive, is enough. "The [psychological] treatment should be based on good solid research, but we are doing it anyway because we don't want to condemn a lot of people to death," says psychologist Charles Bustya of the Morton Prince Clinic for Hypnosis in New York. Bustya considers himself one of the "second generation" of therapists spawned by Carl Simonton, a radiation oncologist in Fort Worth, Texas, and his wife, Stephanie, a psychologist. Many hospitals are now offering psychological support programs to help patients and their families cope with the disease, but the Simontons go beyond that. Their aim is not only to help patients improve the quality of their lives, but to prolong their survival. Influenced by the growing evidence of links between psychological stress and various illness—particularly the plethora of cardiovascular and gastrointestinal disorders—as well as by theories associating particular emotional configurations with diseases as varied as diabetes and arthritis, Simonton and others think it very likely that cancer belongs on the list of stress-related disorders.

And if that is the case, they believe that people may be able to influence the course of their disease by reversing the psychological processes that precipitated it. After all, people have learned through biofeedback, hypnosis, and even simple relaxation techniques to regulate the muscles under the control of the autonomic nervous system so they can reduce hypertension and migraines, for example. People have also learned to control their perception of pain by altering their focus of attention; similarly they have learned to stave off epileptic attacks by slowing down activity in the abnormal brain foci where the attacks are triggered. If all this is possible, it seems reasonable to some people that cancer patients can also gain control over endocrine functions that affect the immune system, or whatever other physiological processes that govern the course of the disease.

It is on premises such as these that the Simontons have founded the Cancer Counseling and Research Center, a private outfit that in the minds of some people is merely a successor to Laetrile, and to others is the generative force in a new and effective approach to helping cancer victims battle their disease. The Simontons are particularly interested in imagery, a technique associated with such practices as biofeedback and hypnosis. In the treatment, used in conjunction with medical therapy, patients are encouraged to visualize and draw pictures of their cancers and what they think—or hope—is happening in their bodies. They depict their cancer cells and, in often highly symbolic images, show how they think radiation and drugs are affecting the tumor. They are encouraged to see their white blood cells charging in, swarming over the cancer cells, and demolishing them. In conjunction with relaxation and visualization exercises, patients are invited to examine how they may have participated in bringing on the disease and to learn ways of overcoming old angers and resentment and to confront their fears about death. The basic idea is to help people gain a sense that they have control over what's happening to them. The imagery is thought to be a very sensitive reflection of a patient's emotional state and therefore his prospects for improvement. People who can't envisage their white cells in an aggressive role, for example, are thought to have difficulty expressing anger.

Jeanne Achterberg, a psychologist at the University of Texas Health Science Center, has found imagery a useful tool in predicting the course of a number of diseases including cancer. She and Frank Lawlis of North Texas State University surveyed 126 patients who had elected to follow the Simonton treatment, 90 percent of whom had widely metastasized cancers. They found that results of psychological tests, particularly imagery, were more predictive of length of survival than the status of the disease as determined through a battery of blood chemistry tests. "Blood chemistries," they wrote, "are merely reflective of the body's current status. . . . Psychological factors, on the other hand, seem to foretell or precede certain physical response patterns."

The Simontons claim in a book pub-

Senate Passes Back Gene-Splice Cup

A delicate stage of bluff and counterbluff has been reached in the government's internal manoeuverings to find a way of regulating recombinant DNA research.

What has set the stage is the expected letter (*Science*, 19 May) from Senator Edward Kennedy (D-Mass.) and others to Secretary of Health, Education, and Welfare Joseph Califano.

The letter, expertly drafted so as to paper over the strong differences between its six senatorial signatories, throws the initiative for what to do about recombinant DNA into the lap of the Administration. A second adroit feature of the letter is that it gives no hint as to what the Senate will do if the Administration throws the ball back.

Califano now has to decide whether he would be better off using existing statutory authorities to regulate gene splicing research, as the Senators' letter invites him to do, or whether to take the chance of thrusting the issue back at the Senate. His chief but not exclusive source of advice, the National Institutes of Health (NIH), has definite feelings on the matter. Officials at NIH do not want Califano to prescribe regulations on the basis of existing statutes. Such a course, they feel, would have all the disadvantages of legislation and none of the benefits. Ad hoc regulations would be inflexible, cumbersome, and would not provide the clout to preempt local authorities interested in writing stricter rules. The House bill avoids all these problems.

Califano, if he follows NIH's advice, may replay to the six senators that he strongly supports the House bill, but that if they are of the opinion that no legislation is necessary, then he for his part would conclude that no regulation is required either.

Such a strategy may stand a fair chance of persuading the Senate to go along with the bill devised by the House health subcommittee, particularly if the bill should be passed by the full House. Failing which, it may bring to the surface the differences among the six signatories and cast the Senate back into confusion, producing NIH's secondmost preferred outcome—no legislation and no regulation.

Just how the Senate would react to such a response, nobody knows. The two chief players at the moment are Kennedy, chairman of the Senate health subcommittee, and Adlai Stevenson, chairman of the science and space subcommittee. It was Stevenson's aides who drafted the 1 June letter to Califano, even though Stevenson is not a member of the health subcommittee, which has exclusive legislative jurisdiction over recombinant DNA research. Stevenson's position as a power-broker possibly arises from his own committee's careful study of the recombinant DNA issue as well as from the fact that Kennedy is strongly opposed on his own committee by senators such as Gaylord Nelson and Jacob Javits. (The letter to Califano was signed by these four and by Harrison Williams, chairman of the human resources committee, and Richard Schweiker, ranking minority member.)

Kennedy's chief interest is in allowing the public a voice in decisions about recombinant DNA research; he therefore opposes a central feature of the House bill, preemption of local authorities, and would presumably prefer that Congress pass no legislation. Stevenson, on the other hand, is said to favor legislation, although his long awaited report has yet to appear. One reason for the delay is that Harrison Schmitt, the geologist-astronaut who is the senior Republican member of Stevenson's committee, does not favor either legislation or regulation. A supporter of voluntary compliance, Schmitt says he now sees less need for preemption—a position not dissimilar from Kennedy's.

In a separate development NIH decided to allow Charles A. Thomas, now of Scripps, to continue to use his NIH funds for recombinant DNA research. The ban was imposed last December after discovery that Thomas did not have the required memorandum of understanding on file with NIH. An in-house NIH committee decided that Thomas, having already suffered the 5-month ban and accompanying publicity, should be free to resume gene splicing research.—N.W.

lished this year* that after 4 years they had treated 159 patients with "medically incurable" malignancies and average life expectancies of a year. They claim that of those who died the average survival time was 20.3 months. Of the 63 surviving, 22.2 percent then had "no evidence of disease," and tumors were regressing in 19 percent. (This result is similar to that claimed by LeShan. He has had about 40 allegedly incurable patients in therapy over the last dozen years and he says half of them are now "well.")

There are those who wish the Simontons would talk less (they are currently engaged in a book-publicizing tour) and publish more. So far, they have only contributed two articles to the scientific literature; the latest is a comparison between two very small patient populations who are defined only by their diseases (multiple and metastasized) and their psychological states. Those whose survival exceeds their doctors' expectations are described as professionally successful, aggressive, verbal, scrappy, and generally active.

Among groups who have taken their cues from the Simontons is the Newton Center for Clinical Hypnosis in Los Angeles. Psychologist Bernauer Newton says they use a Simonton-type approach augmented by hypnosis, which is useful in alleviating nausea, pain, insomnia, and other side effects of treatment as well as in enhancing the effectiveness of visualization exercises. "We believe that psychological factors in many cases influence the onset and the progression of the disease," says Newton. "Over and over and over" he sees individuals who have difficulty expressing strong emotions, who feel unwanted, who have few satisfactions in life—a state that appears to have existed for a long time prior to the onset of the disease.

Psychologist Bustya, who is in New York on leave from the Newton Center, also claims to see a preponderance of characteristics among patients that—according to testimony from spouses and friends—long predated the disease. Many, he says, have a lifelong history of unsuccessful coping mechanisms; an inability to express strong emotions, particularly anger; inhibition, self-consciousness, conformity to the expectations of others, strong "giving-up feelings," and "an awful lot of self-sacrifice."

Those involved in this treatment movement readily acknowledge that

**Getting Well Again* (J. P. Tarcher, Inc., Los Angeles, 1978), a book written for patients and their families.

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their patient population is self-selected (those whose relatives shove them into it rarely do well, says Bustya); furthermore, the Simontons are reluctant to accept patients who they feel have such negative attitudes that they don't stand to profit. Both agree that a patient's acceptance of the basic premises—that their attitudes can affect the course of their disease—and a willingness to work are crucial to positive outcomes.

The Simontons and others emphasize that their program is complementary to, and not a substitute for, orthodox medical therapy. Physicians are described as sympathetic to the treatment so long as no one holds out promises of miracle cures. Nonetheless, there are those who believe the movement could get out of hand, offering false hope in lieu of proven medical therapies.

Jimmie Holland, chief of Sloan-Kettering's psychiatry service and a woman who knows about research in the psychology-cancer area, thinks things have already gotten out of hand. She says there are no scientific data linking psychological factors to cancer, either in predisposing a person to the disease or in determining how well a cancer patient will respond to treatment. She believes that the Simontons, therefore, are perpetrating a "cruel hoax—worse than Laetrile."

The Simontons, however, are trying to directly evoke, through imagery and suggestion, the same activity that Laetrile occasionally appears to evoke through its placebo effect. Elmer Green of the Menninger Foundation, a leading biofeedback researcher, says "the placebo effect is where it's at." Says Green, "Everybody knows there is such a thing as a placebo effect but they don't think about what it is."

Obviously, says Green, it is an activation of the body's self-regulatory mechanisms produced by the individual's expectation. The most startling example of this effect is manifested in the rare cases of sudden remission from cancer. No one knows what causes them, but according to NCI's Fox, investigators have found that "very powerful belief" is the common factor in such cases.†

Potential research has been greatly impeded by the fact that biochemists don't know about psychology and psychologists don't know about biochemistry. Thus we have psychotherapists at one end of the spectrum and mouse researchers at the other and no communication between them. These types, in addition to specialists in epidemiology, genetics, environmental carcinogens, and clinical oncology, will have to be brought together in team efforts if scattered hints are ever going to become merged in a fuller picture. As Bernard Fox wrote in his paper (which, as published in the first issue of the *Journal of Behavioral Medicine*, has 417 references): "It is, truly, a most difficult type of research."

—CONSTANCE HOLDEN

†One thought-provoking case history, reported by Bruno Klopfer in *Psychological Variables in Human Cancer*: A man with advanced lymphosarcoma was included in an experimental study of the since-discredited drug Krebiozen. After one administration, his tumors disappeared. When reports came out that the drug was ineffective he again became bedridden. His physician, in a last-ditch attempt to save him, told him not to believe what he read and treated him with "double strength" Krebiozen—actually an injection of water. The man again experienced rapid remission. Then the AMA and FDA pronounced the drug worthless. The man died within a few days.

IRS Questions Tax Status of Six Science, Engineering Groups

The Internal Revenue Service (IRS) has taken the first steps toward revoking the tax-exempt status of the American Chemical Society (ACS) and the American Institute of Physics (AIP). The IRS has also told three engineering societies and the American Physical Society (APS) they will be reclassified into the category of "business leagues." Although reclassification would not have as serious a financial impact as revocation would on ACS and AIP, the four groups would, for example, have to pay taxes on ad revenue from their publications if they were reclassified. The IRS action is still in its early stages, but, not surprisingly, has sent tremors through many scientific and engineering nonprofit organizations.

At stake for the six organizations is their status under section 501(c)(3) of the tax code, which fully exempts eligible nonprofit organizations—including those with scientific and educational purposes—from paying federal income taxes. Contributors to such organizations may claim exemption from taxes on their gifts.

To be eligible for (c)(3) status, nonprofit organizations must be devoted to one or more of the following purposes: charitable, educational, scientific, literary, testing for public safety, fostering national or international amateur sports competition, or preventing cruelty to animals or children.

The business league category [section 501(c)(6)] into which the IRS proposes to move APS, the American Institute of Chemical Engineers (AICE), American Society of Civil Engineers (ASCE), and American Society of Mechanical Engineers (ASME), is, in general, for associations of persons who have a common business interest such as trade associations or chambers of commerce. This category provides partial tax exemption. But the difference in tax treatment most important to scientific and engineering organizations which publish technical journals is that revenue on advertising would be taxable. This would make a very significant difference in the balance sheet of many such organizations.

All six organizations affected by the IRS initiative have said they will oppose the IRS findings and are at varying stages in their discussions with IRS. Procedures for deciding such issues call first for a conference in the IRS district where each organization is located. If the opinion of the IRS agents who initiated the action is upheld there, the organization can ask for a conference at the level of the national office in Washington. If the result there is unfavorable, the organization may take the matter to court.

Both organizations threatened with revocation—ACS and AIP—have had conferences at the district level, but have not been informed of the result. All three engineering societies had their innings with the district office, lost, and have asked for a review by the national office. The APS filed a rebuttal to the initial letter and requested a conference at the district office, but has not yet been given a date.

According to the ACS, which is lo-

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