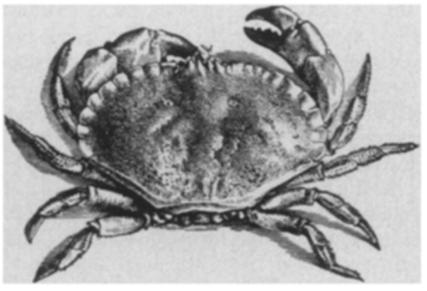
Where's That Promised Cancer Cure?



Opinions vary on the success of the war on cancer, but the past nine years have brought advances and the fight continues

BY JOAN AREHART-TREICHEL

What's the status of America's nine-year war on cancer — the $6 billion in taxpayers' money that has been pumped into preventing, understanding and curing cancer since the National Cancer Act became law in 1971? A whopping success, failure or something in between, depending on your particular view, the statistics you trot out to support your case, whether you are a cynical journalist, a cancer establishment scientist, a cancer patient who has been cured or one who grimly awaits death. In short: The status of this war is particularly tough to assess.

A case in point: the incidence of cancer. Ample evidence can be rallied to demonstrate that the cancer war has made little progress. For instance, as Sen. George McGovern (D-S. D.) testified at 1978 congressional hearings, there were 4.7 million new cancer victims since the cancer war had been launched seven years earlier. An epidemic in lung cancer among U. S. women has begun, the Department of Health, Education and Welfare reported last January (SN: 1/19/80, p. 37). The incidence rate for cancers among whites increased roughly 10 percent from 1969 through 1976, according to a report by the President's Council on Environmental Quality last July (SN: 7/5/80, p. 5). Some 110,000 new cases of breast cancer can be expected in 1981, according to the National Cancer Institute.

Cancer war proponents, on the other hand, argue that the above statistics are misleading, that cancer incidence rates have only gone up because the incidence of infectious diseases and heart disease (SN: 10/6/79, p. 230) has fallen off in recent years, or only because the population has increased since the cancer war started. Cancer war supporters can point out that the Pap test, which millions of women have had in recent years, has reduced the incidence of invasive cervical cancer (SN: 8/23/80, p. 123). Or cancer war advocates can accept the high incidence of cancer but blame it on the public, not on the war per se. At the 1980 International Symposium on Cancer in New York City, for example, Frank J. Rauscher Jr., senior vice-president of the American Cancer Society and past director of the NCI, said that his major disappointment with the cancer war wasn't with the war but rather with the public because not enough people were taking advantage of the scientific information available that could help in the prevention of 60 percent of all cancers. A striking illustration of Rauscher's argument can be found in the case of Paul Adkins, a lung cancer surgeon with George Washington University Medical Center in Washington. He smoked cigarettes for many years although he saw countless examples of what smoking could do in the thousands of lung tumors he removed from patients. He gambled that he wouldn't get lung cancer because his parents had lived long, cancer-free lives in spite of smoking. He lost the gamble. He came down with lung cancer last April and was dead by Aug. 13, although he had access to the best medical care colleagues throughout the United States could offer.

As far as understanding what turns normal cells into cancer cells, even the staunchest cancer warrior can't claim that the war has unlocked the secrets. During 1980 congressional hearings, then NCI Director Arthur Upton testified: "We have only uncovered a few [cancer causes] to date, and we still have to learn precisely how they act." Similarly, war critics stress, a lavish amount of cancer funds during the early 1970s were pumped into proving that viruses cause human cancers just as they cause a number of animal cancers. Yet a definite human cancer virus is still to be found, with the possible exception of the Epstein-Barr virus that causes Burkitt's lymphoma.

Nonetheless, scientists have made at least some inroads toward better understanding the cancer process. For instance, carcinogens all appear to share one thing when they reside in their ultimate forms — they are thirsty for electrons. Then they enter cells, attach to chromosomes and DNA, which they may or may not alter (SN: 5/1/76, p. 276; 6/4/77, p. 363). As for the putative human cancer virus, Epstein-Barr virus, it appears to break chromosomes in Burkitt's lymphoma cells, Frederick Hecht of the Southwest Biomedical Research Institute in Tempe, Ariz., reported at the 1980 international cancer symposium in New York City. Also, the Epstein-Barr virus is known to incorporate its genes into the DNA of Burkitt's lymphoma cells, George Miller of Yale University reported in Atlanta at the 1980 International Conference on Human Herpesviruses.

However, even those who feel the war is being won have to admit that scientists still don't know whether the means by which carcinogens or viruses cause human cancer is by creating mutations in cells' DNA, although there is evidence suggesting this is the case. In fact, they are not even sure that carcinogens or viruses cause human cancer by acting on DNA, since they are known to alter other cellular parts as well as DNA.

What about cancer cures? Both war supporters and detractors alike agree that the war has not brought a cancer panacea, which some of its proponents had promised. They strongly disagree, though, over how much, if any, progress has been made in extending the lives of cancer patients....

Cancer war protesters: During 1978 congressional hearings, Sen. George McGovern noted that cancer had killed 2.6 million Americans during the first seven years of the cancer war. According to the 1979 statistics from House Appropriations hearings, and according to 1980 statistics from the American Cancer Society, more Americans are dying from cancer today than in 1971, when the cancer war was launched — from about 330,000 annually to about 400,000 annually — and the death rate for all major physical sites of cancers has inched slightly upward and has actually soared for lung cancer since 1971. Whereas the five-year survival rate for cancers diagnosed between 1970 and 1973 was up dramatically for whites compared with that diagnosed between 1960 and 1963, survival rate improvements were far fewer for blacks, according to a November report from the National Institutes of Health (SN: 11/8/80, p. 293). In 1981 420,000 Americans will die from cancer, the ACS estimated last month. And when cancer scientists boast of cancer cure rates, they only mean a five-year cure rate. A patient can be declared officially cured and still die from cancer a few years later. An example: movie actor John Wayne.

Cancer war advocates, however, counter that five-year cure rates often

The Cancer War: What's Coming

Here are some of the practical benefits we may receive from the cancer war during the next few years provided the war goes well...

More cures may come with surgery, drugs, radiation or a combination thereof. "I think small cell lung cancer is going to be the next important cancer to be cured," Edward J. Beattie Jr. predicted at the 1980 international cancer symposium, and "I am firmly convinced that surgery, X-rays and drugs will help us cure spreading cancers during the next decade just as we are already using them to cure osteosarcoma."

Dramatic advances in treatments may also come through a new modality — immunotherapy. Lung cancer continues to be the leading cancer killer in the United States, but Ariel Hollinshead of George Washington University in Washington and Thomas Stewart of the University of Ottawa have preliminary evidence that injections of tumor-associated antigens from lung cells can extend the lives of patients with three out of four lung cancers — squamous, large cell and adenocarcinoma (SN: 7/12/80, p. 26). Since interferon was made with recombinant DNA techniques for the first time earlier this year, it has opened the possibility, for the first time, of conducting large clinical trials to see whether interferon is indeed an effective cancer treatment and whether it can prevent cancer in high-risk individuals. Now that monoclonal antibodies are a reality (SN: 8/9/80, p. 85), they may also revolutionize cancer treatment. Robert Nowkinski and colleagues at the Fred Hutchinson Cancer Research Center in Seattle were the first to report, last year in SCIENCE (Vol. 207, No. 4426), that monoclonal antibodies can kill tumors in animals, and in August Hilary Koprowski of the Wistar Institute of Anatomy and Biology in Philadelphia and colleagues were the first to report success in using monoclonal antibodies to selectively target drugs against cancer cells (SN: 10/4/80, p. 215). Yet a fourth promising immunotherapy for cancer was reported at the 1980 international cancer symposium by Isaiah J. Fidler of the Frederick Cancer Research Center in Frederick, Md....

When a cancer metastasizes (spreads), forming secondary tumor growths at sites distant from the primary tumor, the outlook for the patient is grim. Metastasis, in fact, is the most common cause of cancer-treatment failure. Fidler and his team found that if macrophages (cells that comprise part of the body's immune system) are first activated in tissue culture with macrophage-activating factor, and then injected into mice with metastases, the macrophages would kill the metastases. However, the mice that received the macrophages had to be immunologically compatible with the mice that donated the macrophages for the macrophages to be effective. So it would be impractical to use this approach in cancer patients, Fidler and his co-workers concluded. Then they devised another way of using macrophages to treat patients with metastases: injecting them with macrophage-activating factor rather than with macrophages per se. Yet MAF, they found, didn't activate macrophages as much in tissue culture as did MAF encapsulated in liposomes (lipid vesicles). So then they injected MAF in liposomes into mice with tumors and found, as they hoped, that the packets were highly successful in preventing metastases. So it looks as if MAF-liposome packets "may provide a valuable addition to the more conventional approaches to the eradication of cancer metastases," Fidler and his colleagues conclude.

Another possible contribution from the forthcoming cancer war: Heat directed against tumors. The initial results have been good, and $4 million of cancer war money was channeled into this area of research in 1980. Exercise as a form of cancer treatment may also turn out to be worth something to patients. At the 1980 international cancer symposium, Robert A. Good of Memorial Sloan-Kettering Cancer Center reported that Gabriel Fernandes of his center has found that mice that jog experience more cancer regression than do mice that don't. More cancer prevention techniques may also become available to the public since one-third of the 1980 cancer war research budget was directed toward prevention research. Dietary manipulations, for instance, look especially promising (SN: 6/23/79, p. 404; 8/23/80, p. 123).

But as before, progress will come in numerous discrete steps, not in several whopping discoveries. In other words: Even the most successful cancer war isn't going to reshape the cancer research process, although it may speed it up.

mean long-range cures. One example can be found in breast cancer patients; many have survived 30 years and have lived out their natural lifespan. Another example is some of the children who have been "cured" of childhood leukemia. Some have grown to a healthy adulthood. The advocates also point out that there have been some dramatic advances in extending cancer patients' lives since the cancer war started. Nearly a dozen human cancers now have a five-year cure rate that they didn't have before the cancer war, R. Lee Clark of the University of Texas System Cancer Center in Houston reported at the 1980 international cancer symposium in New York City. At the same meeting, Rauscher went further, declaring that 15 human cancers had become curable during the 1970s that weren't curable before. In the April 1980 AMERICAN PHARMACY, Vincent T. DeVita, current director of the NCI, wrote that 41 percent of serious cancers are now being cured. The ACS claims the same in its 1981 "Cancer Facts and Figures." Only about 30 percent of serious cancers were being cured in the 1960s, Rauscher told SCIENCE NEWS.

Clinical trial results can also be rallied to support the above claims. In the 1950s the outlook for children with acute lymphocytic leukemia was hopeless. In 1960, they survived only a year. Now, thanks to a combination drug-X-ray treatment, 40 percent of children with this cancer can be cured (SN: 3/3/70, p. 133). Similarly, in 1964 the median survival of patients with advanced Hodgkin's disease (cancer of lymph tissue) was only two years. Now, more than 50 percent appear to be curable, thanks to combination drug therapy (SN: 5/17/80, p. 311). Osteogenic sarcoma, which was invariably fatal during the 1960s, has also become almost totally curable, Edward J. Beattie Jr. of Memorial Sloan-Kettering Cancer Center reported at the 1980 cancer symposium. Still other cancers that clinical trial results show are today curable, and that weren't before the cancer war, are testicular cancer in adults and solid tissue non-Hodgkin's and rhabdomyosarcoma in children.

Lesser, but noteworthy treatment advances can also be deployed to argue for the success of the cancer war. While lung cancer continues to be a major cancer killer, some patients with the swiftest and deadliest lung caner — small cell — are having their lives extended by a cancer drug combination from the usual few months up to seven years (SN: 7/12/80, p. 28). Last September, Lucius F. Sinks and colleagues at Georgetown University Medical Center in Washington reported that since 1977 they have achieved a regression in brain tumors (a highly lethal form of cancer) among a handful of pediatric patients by using a new drug called cisplatinum.

So what's the status of America's war against cancer? Success? Failure? Something in between? Once again it depends on your particular vantage point — not unlike the assessment of America's problematic war in Vietnam during the 1960s. Unlike the Vietnam debacle, though, the cancer war is still in high gear. Let's see what the next few years bring. □