

Do the French Have a Cure for Cancer?

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*Behind a curtain of secrecy and hocus-pocus,
the answer may be yes*

FRANCE: For the moment it didn't matter to me that the country that gave us shoes with taillights, the musical typewriter and a machine that pulls on your socks might also have produced an apparatus that, by some electromagnetic magic, cures cancer, lowers cholesterol and vanquishes sleeping sickness. Air Inter's flight from Paris to Bordeaux was packed to its gills, and the little girl sitting next to me was green around hers. She just managed not to throw up on my new Italian shoes.

But once outside the terminal, in the city noted for its wines and, more recently, its wine adulterations, I was again enthusiastic about the prospects of seeing, at last, the machine that has been called the Second Coming. A thirty-minute taxi ride through a pouring rain delivered me to the *Institut National de la Santé et de la Recherche Médicale*, a bureaucratic huddle of buildings surrounded by mud. The little waiting room to which I was directed was in near darkness at midday: the energy crisis in the process of being paid heed. A friend of mine in Paris had said angrily, "All they're doing in Bordeaux is burning electricity in that imbecile machine at the rate of one thousand francs per day." In light of the darkness, this seemed unlikely; but such, I reflected, as a glass window slid open and a voice announced, "Dr. Pautrizel will be with you shortly," were the irrational passions of what has come to be known as *l'affaire Prioré*, a controversy of the first water that, for more than a decade now, has galvanized with excitement and often divided with suspicion, bitterness and envy the elite of the French scientific establishment. As a direct consequence of the *affaire*, some of the most august reputations in continental science stand soon to be tarnished, perhaps beyond recovery, or to be imbued with new, possibly everlasting, luster. Critical events of the next few months, played off against those of the past decade, may well be the making, or breaking, of Nobel Prize winners. *L'affaire* is coming to a head.

For two years I had been consumed with curiosity about the affair, named after its principal character, Antoine Prioré, an Italian-born inventor noted by his enemies for his lack of formal education and by his friends for his intuitive genius. Prioré, I knew, had

been tinkering with odd, complex electromagnetic contraptions of his own design for twenty-six years—since his days as a radar technician in the Italian navy. What education he received was of the trade-school variety: a diploma, in 1930, from the Alessandro Volta Technical Institute for Industry in Trieste and another, later on, from an electronics school in Bologna.

Prioré would later tell me that he had serendipitously discovered that certain ultrahigh-frequency electromagnetic waves, presumably somewhat akin to those utilized in the radar devices with which he was so familiar, had the power of preserving fruit. An orange that had inadvertently been exposed to the radiation, he noticed, remained unspoiled much longer than it should have. Assuming that the radiation must somehow have been responsible, he decided to experiment, soon verifying, he said, that the shelf life of various fruits and vegetables could be significantly extended by exposing them to certain electromagnetic waves.

Imprisoned by the Germans during World War II, Prioré had ample time to devise and reflect upon his electromagnetic theories. But whatever he devised he kept to himself. He escaped from the Germans and, in 1943, made his way to Bordeaux where he became active in and eventually a decorated hero of the French Resistance. He adopted the city, and the city warmly embraced him in return. With nearly every franc he could earn or borrow from his expanding coterie of admirers, Prioré purchased old generators and other electrical components set adrift by the U.S. war surplus. Out of these, he constructed a machine so bafflingly complex in appearance that it would, even today, do justice to a set for a high-budget mad-scientist movie. It filled a good-size room, its panels of knobs, dials, lights and energy units banked against the four walls so that there remained only a small space in the center of the room for a table, over which was suspended a huge nozzle, through which emanated the output of the machine, the ray itself. Just what the invisible ray consisted of, Prioré steadfastly refused to say, other than to characterize it as "an electromagnetic wave in a magnetic field," which is on a par with an ornithologist describing the aboriginal-sloe-eyed-puce-breasted-tawny-tanager as a bird.

Prioré's instincts were then, as now, those of the

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lone inventor for whom to give up the secret is to give up life. It's all he's got. But as far as Science is concerned, excusing for the moment that segment of Science that labors in the service of private, competitive industry, concealment of any sort is the prime symptom of fraud. And, thus, had it not been for the inventor's "patriotic connections," I had been told over and over, no one would ever have heard the name "Prioré" uttered, let alone uttered favorably, in the rarefied air of the French Academy of Sciences. Principal among those "connections" was Jacques Chaban-Delmas, a fellow alumnus of the Resistance and, beginning in 1947, the mayor of Bordeaux. Not so curiously, perhaps, many French scientists have been more interested in trying to establish a positive correlation between the amount of government funding accorded Antoine Prioré and the various levels of political power to which Chaban-Delmas has attained than in verifying the correlation between Prioré's mystery radiation and cancer cures in laboratory animals.

When the French government, not long ago, decided to spend about one million dollars for the construction of a new "super machine" designed by Prioré, many pointed out that Chaban-Delmas was then premier. A couple of years earlier, when the military had offered more modest funding, some had even made a point of the fact that Chaban-Delmas, quite suspiciously, had been minister of defense in 1958! One wondered why Prioré and his machine didn't disintegrate into a puff of smoke the morning, in 1974, when Chaban-Delmas awoke to discover that he had been soundly defeated in his bid for president.

Prioré himself is the first to acknowledge that the Bordeaux politician was a help. Chaban-Delmas helped him obtain better equipment, provided him with laboratory animals on which to conduct some of his experiments and, no doubt, encouraged, with his considerable prestige, a few scientists to pay heed to some of the inventor's claims, which, if substantiated, presaged a development of tremendous import. It was through the chief veterinary officer of the city of Bordeaux that Prioré was persuaded, in 1960, to permit two members of the University of Bordeaux Faculty of Medicine to expose rats grafted with cancerous tumors to the radiation of the machine. To the amazement of the two—Professor J. Biraben and Dr. G. Delmon—all tumor growth was halted. The researchers were so startled, and so convinced that they would be, accused of hallucinating or worse, that they waited until 1966, when others were also reporting spectacular results with the Prioré apparatus, to publish their findings in a leading medical journal.

Reports of their results had spread by word of mouth well before that, however, and soon two eminent cancerologists from the Institute for Cancer Research at Villejuif, Professors Marcel Rivièrè and Maurice Guérin, were collaborating with Prioré and two other researchers, Maurice Fournier and Francis Berlureau. The results they attained seemed to one Robert Courrier so convincing and of such significance that he decided to put his immense prestige directly behind their work by personally presenting their results to the French Academy of Sciences on December 21, 1964. Professor Courrier, an internationally known biologist and the *secrétaire-perpétuel* of the Academy of Sciences, began cautiously. He pointed out that just as a great number of different chemicals had been tested on cancer so, over the years, had a variety of rays. He was mindful, no doubt, that the bad odor "biomagnetism" had accumulated over the centuries, at the hands of quacks and charlatans, persisted still. The

Prioré machine, he continued, at last provided an opportunity for *scientific* evaluation of the biological effects of "radiation in an electromagnetic field." The field was defined only as having an intensity in the neighborhood of 620 gauss—about 1240 times the power of the natural earth field. The frequency of these waves was said to be approaching that of gamma radiation.

Some forty-eight rats of the same heritage, age and health had been selected for the experiment that Professor Courrier related. All had fragments of the same uterine T8 cancer tumor grafted beneath the skins of their backs. Previous experiments had proved that this breed of rat, grafted with T8, would die within three to five weeks if untreated in any way. Half of the rats were controls—set aside and given no treatment. They were, however, fed and housed in exactly the same manner and environment as the twenty-four experimentals, all of which were exposed to the radiation of the Prioré apparatus. Exposure was effected simply by placing their cages under the nozzle of the machine. Twelve of the experimentals were given treatments commencing the same day as the grafting. In the remaining twelve experimentals, treatment was delayed for several days in order to permit the cancer to metastasize (spread) throughout their bodies.

The results: Among those experimentals which were given immediate treatment, the tumors were quickly and totally absorbed. Where treatment was delayed, exposure had to be prolonged in order to obliterate the cancer. But obliterated it was—until all of these animals, as well, were in perfect health, with no trace of cancer. The experimentals were observed for several months and there was no recurrence of the disease. All of the controls, meanwhile, died between the twenty-second and thirtieth days after grafting.

The report was met with stunning and perhaps stunned silence. In light of criticisms that were to erupt later it is clear that many in the audience simply did not believe the report; others, no doubt because they couldn't explain the phenomena that had just been related, hoped that if they were quiet long enough it would all go away. A Nobel Prize winner, asking not to be quoted by name, once observed, "Cancer is not a disease for which we will suffer a cure lightly or joyfully." Too many competing investments of both ego and money for that.

The Bordeaux researchers were, of course, irate over the apparent indifference with which their labors were greeted. But they already had new experiments under way, and, in February, 1965, Professor Courrier presented a second paper at the Academy on behalf of the same group. In this experiment, it was revealed, leukemia and another form of cancer had similarly been overwhelmed by the machine's radiation. Again, all the experimentals had lived; all the controls had died. If science chose to ignore all of this, the press did not. Newsmen descended on the humble Prioré abode in mass—only to find the inventor unwilling ("Isn't the word 'unable'?" some asked) to explain the inner workings of his machine.

It was not until the next month, however, that the matter was to erupt into *l'affaire Prioré*, so noted by the French press, so called by the droves of French scientists who gossiped of little else in their laboratories, lounges, meeting rooms. Professor Courrier, intent upon dispelling the innuendos of fraud, told the now visibly startled Academy (*Continued on page 142*)

rials: exotic woods like cocobolo, bird's-eye maple, walnut, ebony, or synthetics like Micarta. Most cutlers will make handles of any material the customer provides, and Randall has made them from ivory (which is beautiful, but cracks with time), walrus ribs, whale teeth, walrus tusks, petrified mastodon tusks, and of course the curious and rare oosts. Handles should be sturdy and impermeable to resist the blood, sweat and occasional tears of use.

Then fashion a butt of aluminum and drive it on and peen it into place, or thread the end of the tang and fit it with a nut. Shape the hilt and handle with rasps and files, smooth with emery cloth, polish everything. Sharpen the blade. Sharpen it sharper at the proper bevel of twenty degrees. Polish everything again. Wipe with oil and deliver, not in its sheath, which absorbs the oil and leads to corrosion (fine knives should not be stored in their sheaths for this reason).

All this takes a good bit of time and most smaller makers perform every step single-handed. Randall does not, but each man's work is so individual that Gary Randall can pick up any Randall-made knife, examine it closely, and tell you who ground the blade, who fitted the handle, who did the final polishing, and the year in which the knife was made.

A Model 12, Randall's "Smithsonian bowie," has an eleven-by-two-and-a-quarter-inch blade of three-eighths-inch stock. Randall calculates it requires between ten and fifteen hours of work, plus several separate temperings, plus eight hours in the oven. The knife contains about five dollars' worth of materials and sells for \$160, which works out to about ten dollars an hour to make it, from which overhead and labor must be paid and some slender profit realized. A small trout and bird knife with a four-inch blade takes five or six hours and costs \$52.

The Randalls are lucky. They have independent means and can afford their true vocation. The average one-man shop produces thirty or forty knives a month at perhaps \$50 apiece, which is no way to get rich. Most knifemiths live in the countryside of such frontierish states as Montana, Texas, Oregon, Washington, Louisiana. Many are retirees; they have the time to seek the perfect blade.

I asked Gary Randall, a devoted outdoorsman, which knife he uses, and he said he switches each year or so to test different ones. This year he is using a Randall Model 22. "But our Model 3 with a five-inch blade is absolutely the best-designed knife for all-around use that I've ever run across," he said. "Of course it all depends on the customer's use and preference."

I inspected my own Randall, which turned out to be none other than a Model 3, but with a seven-inch blade. It was, really, a little too long and sword-like to fit those stumpy little mustard jars. I left it with Randall who promised to grind the blade down two inches. #

Do the French Have a Cure for Cancer?

(Continued from page 111) in March that he had personally sent one of his most trusted assistants to Bordeaux with eighteen rats, all of which had been grafted, under his own direction, with cancerous tissue.

The assistant had been instructed to watch the rats at all times and to keep them, at night, in a laboratory some distance from Prioré's house, so that no one could reasonably charge that healthy animals had been substituted for those with cancer. Ten of the rats served as controls, eight as experimentals. Professor Courier specified that four of the experimentals be treated for one hour daily and that the remaining four be exposed for two hours daily. All of the controls, he said, had died within fifteen days of the grafting. The four experimentals that were treated for one hour each day also died. The four treated for two hours daily recovered and were in excellent health in Professor Courier's Paris laboratory.

At the conclusion of his address, the secretary indulged in the extraordinary exercise of counseling both sides of the controversy. Noting that "science does not hold with black boxes, with apparatus shrouded in mystery," the professor advised Prioré to elucidate the inner mechanism of his machine, or, at least, to permit competent physicists to examine it without hindrance. Then he proceeded to chastise those who, through the unfounded suggestion of fraud, would impugn the integrity of scientists whose work had attested, for years or even decades, to their competence, honesty and fidelity to scientific method.

It was, as some who were there recall, a moment of great theater, a moment that was heightened when, as Lord Solly Zuckerman, himself a leading biologist and former chief scientific adviser to the British government, wrote in *The Times* of London, "Professor Antoine Lacassagne, one of the most respected radiobiologists of the century, stood up to indicate his total disbelief and insisted that the printed record of the meeting include a note of his regret that conclusions had been drawn too hastily from the observations that had been reported. . . . I can well imagine," Lord Zuckerman added, "how Professor Courier and Professor Lacassagne felt in this confrontation. I had known the two from the early Thirties. Lacassagne's scientific authority was equal to that of Courier, and he spoke with a lifelong background of work in the Radium Institute of Paris. Yet, apart from uttering his warning, he provided no word of explanation for the results which Professor Courier had reported, even though they related to grafts which should have proved fatal. Professor Lacassagne has since died in his eighties, mortally affected by cancer."

In the meantime, Prioré had been constructing a new, more powerful machine, one capable of producing a magnetic field of about 1240 gauss. The

researchers at Villejuif lost little time in making use of it, this time to see whether the animals that had been cured of their cancers in previous experiments could withstand new grafts without once again being exposed to the Prioré radiation, in short, whether they had developed immunity to cancer. Animals that had been tested two, six and ten months earlier were grafted a second time with the same type of cancer they had been exposed to before. The grafts were uniformly rejected; the immunity appeared unmistakable.

A story began circulating about this time to the effect that British scientists, seeking to verify some of the Bordeaux findings, had sent a group of diseased animals to France for treatment. The animals that came back to Britain were indisputably healthy but, unfortunately, or so the story went, they were not the same ones that had been sent in the first place! The story that still circulates among the anti-Prioré forces is that the director of the British study, feeling that he had been made a fool of, was not eager to broadcast his "mistake," and that, supposedly, is why he will not give his name for publication. A document confirming the "fraud" has been sent by the "duped" Briton to the director of a French laboratory who will show the document to reporters—on the condition that his name not be used either. Apart from the bad smell of the not-for-attribution accusation, can a reasonable individual fail to wonder why the British investigator considered himself made a fool of if, indeed, he discovered the fraud that so many others would give their best beakers and retorts to prove?

In 1966 the research in Bordeaux took a critical turn even as new accusations of "irresponsibility" were being heaped on Prioré. Some observers think the resistance to Prioré was based on fear: a Prioré cure would not only be a cure from outside the familiar areas of cancer research (chemotherapy, viral studies and the like) but, worse, would be a cure from outside the club, from outside, as one doctor put it, "the cancer cartel." How could science explain to the world that a mere "handyman," as Prioré was characterized in one French publication, had succeeded, alone and with limited funds, where the best doctors and scientists at the best universities and medical schools with millions of dollars in funding had failed? It could not and it would not—not, at least, without thinking it over for a good long while.

Perceiving all of this was one Professor Raymond Pautrizel, head of the Department of Immunology and Parasitology at the University of Bordeaux and an international authority on the trypanosome, the blood parasite that causes sleeping sickness and tens of thousands of deaths each year. Professor Pautrizel had become fascinated with the Prioré apparatus when researchers began using the university's laboratory facilities to house animals they were subjecting to the radiation

at Priore's house on the other side of town.

The experiments reported on in 1966 suggested to Professor Pautrizel that the radiation, whatever its nature, might not be attacking the cancer cells directly but, instead, could be stimulating the natural immune-response mechanisms of the animals, potentiating them to the point where they were able to overwhelm and reject the cancerous grafts. If this were so, then something greater—*far greater*—than a possible cure for cancer had been found. For if this were so then the radiation might prove equally effective against any number of other diseases in which the body's immunological responses often prove inadequate. If, for example, the Prioré radiation could reverse the normally fatal course of laboratory-induced trypanosomiasis in animals, then the immunity-stimulating properties of the radiation would be substantially proved.

And, not to be overlooked, Pautrizel reasoned, an extraordinary scientific development would be permitted to cut its teeth and perhaps even grow to maturity, using, for nourishment, a disease whose cure would save primarily Third World lives and thus, to be cynical and very likely accurate, threaten fewer important First World scientific reputations. One could always attack cancer again later—when one was better established. And in the meantime, of course, Professor Pautrizel, aware that his competitors around the world were working hard to develop a trypanosome vaccine, would welcome the opportunity to zap the parasite. He must have been persuasive, for, abruptly, all the Bordeaux cancer research was suspended and the barrel of the machine was henceforth aimed at a new target: *Trypanosoma equiperdum*.

It was in order to interview Professor Pautrizel, the man who, next to the inventor himself, has loomed largest in *l'affaire Prioré*, that I had journeyed to Bordeaux. The professor I found to be an affable, compact man with a ready smile, precise manner and keen wit. Through the good translative offices of his secretary and assistant, Colette Cauchois, I asked the professor, who is both a doctor in medicine and a doctor of science in chemistry, how he felt collaborating with a man unschooled in either of those fields, or in, from a strictly academic point of view, any field. "Honored," he answered unhesitatingly. And, in any event, he added, Prioré may soon have an earned doctorate attached to his name. The inventor has completed all the doctoral requirements of the University of Bordeaux, including his dissertation, "Healing of Acute and Chronic Experimental Trypanosomiasis by the Combined Action of Magnetic and Electromagnetic Modules."

The experiments of eight years are detailed in this book-length study. From it, our conversation, interviews with others and papers published in various scientific journals, I was able to construct the following events: In 1966, the first of the trypanosome results were

presented to the Academy. Mice had been injected with twenty thousand virulent trypanosomes each, enough to kill the animals within five days (at which time the prolific parasite would have multiplied to one million per cubic millimeter of blood). The experimentals were subjected to the radiation of the first Prioré machine, the one that generated 620 gauss, beginning within one hour of exposure to the parasite and were kept there for twelve hours each day for twelve consecutive days. Eighty-two percent of them survived, fully recovering their health. When the researchers used the more powerful second machine, all of the experimentals survived. All of the controls, meanwhile, died as expected within five days.

Over the next few years it was demonstrated that these experimental mice, along with dozens of rats and rabbits also exposed to the radiation, developed a specific immunity to trypanosomiasis. As long as two years after they had first been exposed to and healed of the disease, they could be injected with dosages of two hundred million live trypanosomes and never develop any sign of the affliction. This immunity, moreover, was shown to be transferable. Mice exposed to the disease were treated and cured with the radiation, then portions of their blood were injected into other mice. These recipient mice, none of which ever had benefit of the Prioré radiation, were then inoculated with what would normally have been lethal numbers of parasites. Those that had received highly diluted blood fractions with low antibody counts died. Those that received blood with more highly concentrated antibody content lived. Professor Pautrizel had apparently been right; the machine seemed to work by stimulating the biological defense mechanisms of the organism. The possibilities now seemed potentially unlimited.

Next, the researchers wanted to know whether the radiation could vanquish trypanosomiasis after it had become entrenched. Rabbits were used in these experiments because the disease produces in them a chronic malaise in which they decline toward death far more slowly than mice. Infected rabbits that were still living at the end of three weeks were exposed to the radiation; improvement began to manifest itself almost immediately, but the treatments, when initiated at this advanced stage in the evolution of the disease, had to continue for twelve hours each day for about twenty consecutive days on average before healing was complete.

In the course of one of the rabbit studies, Prioré gained another powerful supporter in the person of Gaston Mayer, a well-respected reproductive scientist. In collaboration with Professor Pautrizel, Professor Mayer found that the normally irreversible testicular degeneration caused by trypanosomiasis could be overcome with the radiation. Spermatogenesis and hormone production were restored to normal levels in rabbits, the testicles of which were already badly afflicted when first exposed to the radiation. Male rabbits thus

treated fathered normal offspring.

Despite the fact that by 1969 hundreds of irradiated animals had been tested by diverse researchers, skepticism and even the occasional suggestion of fraud were still being heard. Exasperated, Professor Courrier proposed a course of action almost unheard of in scientific research. A large committee, including individuals professionally trained in security techniques, would be formed to supervise and validate a series of experiments with the Prioré machine. Apart from ten professors of science and medicine, the committee would include a number of "pillars of the community"—an air force general, the chief legal officer of the city of Bordeaux, the prefect of the province, an electronics expert, the dean of the University of Bordeaux Law School and those security experts knowledgeable in the ways of fraud.

Elaborate precautions were taken to mark and identify control and experimental mice so that there could be no covert substitution of animals without resort to magic. Special seals were placed over laboratory doors; these were broken twice a day to permit the researchers to treat and examine the animals. All manipulations of the animals were witnessed by other officials, all movements of the animals dutifully charted.

At the conclusion of this exercise, the results were much as before—of the thirty mice inoculated with the parasite and then treated with the machine, twenty-nine lived. Twenty-six of the thirty mice inoculated with the trypanosome but left untreated died within a few days. An additional thirty mice, both uninfected and untreated, but housed, fed and handled in a fashion identical to that accorded the diseased mice, all continued to exhibit normal health and behavior. The committee unanimously affirmed the authenticity of the experiments.

New supporters were attracted, among them André Lwoff, the 1965 Nobel Prize winner for medicine and previously director of the Institute for Cancer Research at Villejuif. It was Professor Lwoff, not ex-Minister Chaban-Delmas, who was instrumental in persuading the research arm of the French military to give Professor Pautrizel money to continue the biological studies. At the same time, two physicists were provided funds for the purpose of making a study of the machine itself. The World Health Organization also began giving funds in 1969 and has continued to do so to the present time.

With this fresh infusion of money and support, Professor Pautrizel, satisfied now that the machine could be effective against autoimmune maladies like cancer and infectious maladies like trypanosome, decided to press his luck and see whether a third class of diseases, the metabolic maladies like atherosclerosis, might also be vulnerable to the radiation.

"But how could the machine have such diverse actions?" I asked.

"How could aspirin?" Professor Pautrizel responded. In any event, here was

the evidence. He shot a 1972 paper across his desk at me. It was entitled "Action of Electromagnetic Waves and of Magnetic Fields on Lipid Modification Provoked in the Rabbit by Administration of a High-Cholesterol Dietary Regime." It was authored by Professor Pautrizel, Prioré, Modeste Dallochio and René Crockett and presented to the Academy by Professor Courrier. Sure enough, the results indicated that the radiation might make a significant contribution in the fight against heart and vessel disease.

Dozens of rabbits had been fed in identical fashion on a high-cholesterol diet which, base studies had shown, quickly resulted in a state of hypercholesterolemia followed by the extensive deposition of fatty, lipidic material in the aortic vessels of the animals. In the first experiment, six of the hypercholesteremic rabbits were given daily treatments of ninety minutes' duration under the Prioré machine. Six hypercholesteremic control rabbits received no radiation. By the third week, all of the lipidic components (cholesterol in particular) of the irradiated rabbits were substantially lower than those of the untreated animals.

Subsequent experiments using greater numbers of animals confirmed these initial findings and, in addition, revealed that the cholesterol-suppressing quality of the radiation persisted for weeks after radiation treatment was halted, despite the fact that the animals continued to be maintained on the high-cholesterol diet. At the end of two months on the high-cholesterol diet, irradiated animals were found to have nearly normal lipid levels while the untreated controls had levels roughly three times normal, with lipid deposits covering fifty percent of their aortic surfaces. Finally, it was established that animals exposed to the radiation in advance of being made hyperlipemic could more quickly cope with the high-cholesterol diet once it was introduced.

Studies like these seemed to clinch it. Even the most hidebound of critics had to concede that it was better to give "them" the money for the "definitive experiments" than endure cries of outrage over an "imaginary" conspiracy to suppress what one Prioré opponent sarcastically called the "Second Coming." Some of the critics still spoke of "statistical flukes" and the like and reckoned that the "definitive experiment," if ever performed to their satisfaction, would only vindicate their skepticism. So, yes, go ahead; give them a million dollars for a new, more powerful, more finely tunable machine. But, and here the critics surely argued fairly, give the money only on the condition that Prioré permit both the results and his new machine to be scrutinized by teams of government-appointed experts.

And so it was done. The *Délégation Générale à la Recherche Scientifique et Technique* (D.G.R.S.T.), one of the top French government scientific agencies, drew up a contract providing \$700,000 for construction of the new machine

(There are unofficial reports, confirmed by Prioré, that the actual final bill for the machine now nearing completion will be closer to \$3,000,000, proving that Americans are not the only ones capable of sizable cost overruns.) The director of D.G.R.S.T. at the time the money was awarded was Pierre Aigrain, a physicist who received some of his training in the United States and who, recently, was conducting research at M.I.T. Dr. Aigrain, who has held various high government posts and is noted for his work in the complex physics of semiconductors, was at a loss to explain the underlying principles of the Prioré apparatus, despite the fact that he has personally examined the machine. "None of the possibilities of resonance appear to answer to the known laws of physics," he was quoted as saying at the conclusion of that examination.

One of the more rational skeptics, Dr. Aigrain had long maintained that even if nothing came of those "definitive" tests, they should nonetheless be performed in light of the very great benefits that would accrue if something *did* come of them. In a conversation with me, he said that while "it is possible that the machine's actions represent something quite revolutionary, it is also possible that its effects accrue from something quite ordinary." He is disturbed by the "busy-ness" of the machine and wonders whether its complexity does not mask "some rather simple element" that is, alone, having the crucial effect. Could the rest all be window dressing designed to persuade where the unadorned, seemingly too simple, "bare facts" of biomagnetics had failed to have much impact so many times before?

Because there have been isolated reports in the literature of seemingly miraculous events occurring under the apparent influence of electromagnetic fields. In fact, if one begins looking, one finds that there is quite a lot of evidence to suggest that magnetic fields have profound effects on biological organisms, but Dr. Alexander Kolin, a U.C.L.A. biophysicist writing in *Physics Today*, cautions that there has been exasperatingly little progress made in compounding these results and in bringing them into the full light of day.

Some of the experiments indicated that exposure to magnetic fields of certain intensities could *reduce* resistance to cancer. At first blush, one such report, published in the prestigious journal *Nature* thirteen years ago, might seem to contradict the French findings. But, in fact, since the intensity of the radiation was quite different from that used by the French, it perhaps, if anything, lends support by showing that such fields *do* have effects on cancerous tissues and the immunological response systems of animals.

There is no universally accepted theory to explain the effects of magnetism on life. (Some might still question whether there are any such effects; others with a scientific bent are sometimes quick to accept the likelihood of magnetically induced climatic changes

and the effects of these fields on plant growth, but are, at the same time, quite irrationally, I submit, loathe to admit to any possibility of a magnetic effect on cancer.) It is now beyond theory, however, that electrically charged atoms and molecules called ions exist in the cells and quite naturally interact (though just how, we still do not fully understand) with magnetic fields, whether natural or man-made. In this connection, the work of Dr. Andrew Bassett and his associates at Columbia University's College of Physicians and Surgeons is instructive. They recently reported that broken bones exposed to certain electromagnetic fields heal substantially faster than fractures that do not have benefit of this stimulative treatment. In one of Dr. Bassett's studies, "fracture disability time" was reduced by fifty percent. The healing probably takes place as a result of voltage-induced changes at the site of the cell membrane. Dr. Bassett believes, *New Scientist* notes, "that electromagnetic stimulation has the effect of changing the membranes' ability to bind such ions as calcium, magnesium and sodium."

A number of other recent findings suggest that electromagnetism may have a profound impact on enzymes, the essential catalysts of metabolism. In one study, for example, magnetically deprived mice (those placed in extremely low magnetic fields) suffered shortened life-spans, unfavorable tissue alterations, infertility and "drastic changes in enzyme activity" that were said to be "potentially lethal." A recently developed Navy study demonstrated that low-frequency fields could, at a level of statistical significance, increase the blood triglyceride levels of man. (Triglycerides are lipids which, along with cholesterol, have been implicated in atherosclerosis.) The Navy research suggested that low-frequency fields effect a decrease in the activity of an enzyme that helps suppress blood triglyceride levels. It is not illogical to assume that certain high-frequency fields might affect the magnetically vulnerable lipids and enzymes in another, perhaps opposite, direction.

Nevertheless, the work in biomagnetics has never attracted widespread attention, and the possibility remained that Prioré, having taken note of how little heed had been paid biomagnetic researchers despite their sometimes spectacular findings, had reasoned that no one in this realm would be listened to until he or she constructed an apparatus as big and as impressive as the results it obtained. It was bad enough that cancer might be cured with "magnetism" (Gad! Wasn't that the stuff Mesmer fooled around with?), but to do it with a few simple horseshoe magnets would be inelegant beyond redemption. Not that anyone is suggesting that it can be done with simple horseshoe magnets, only that it *might* be possible with something considerably less complex than what Prioré has puzzled together "by feeling," as he puts it. This is what Pierre Aigrain seemed to be suggesting. It was what had occurred to me many

months before as I read the biomagnetic literature. But while Dr. Aigrain and I shared the belief that some simpler devices might be capable of some remarkable results, neither of us, finally, believed that Prioré had knowingly added useless parts to his machine.

Dr. Aigrain said that Prioré, "not being a scientist," simply does not know which components are critical and which are not, that he is using what amounts to a "shotgun approach," channeling a great many energies through the machine, secure in the knowledge that something in there—but what?—works. This theory may be comforting—especially for a highly credentialed physicist who is at pains to explain a machine constructed by a self-made engineer—and while I sympathize with it I have come to believe that it probably is not correct.

Prioré has stated that he has experimented with some of the separate outputs of his various machines, and while some of the emanations work solo to effect certain changes, none *alone* gives the results obtained in the cancer, trypanosome and cholesterol studies. The biomagnetic research of others, while very important, he would argue, only helps to reinforce the idea that there is something powerfully real coming out of his machine. Just because bones can be healed with an apparatus simple in comparison to his own does not mean that much of his machine is superfluous, there for show, or, as I once imagined, there to institute a huge mechanical placebo effect. He would defy those who are using their simpler devices to achieve isolated healings or alterations in tissues to replicate his results. Prioré is confident that while others may have bits and pieces of it only he has the *whole* secret.

Dr. Aigrain stressed that "a number of top scientists" have more faith in "this thing" than he has. "The machine does seem to have an effect; I don't deny that," he said, "but none of the tests, as far as I was concerned, were completely adequate. Only when you have a careful biological study proceeding *concurrently* with one that measures the radiation coming out of the machine, so that you know precisely what radiation has had what effect at what moment, can you call the tests definitive. We funded the new machine under the condition that just such tests be conducted." Dr. Aigrain insisted that the machine be built by a reputable electronics firm selected by the French government. He also wanted the machine constructed at a university but finally gave in to Prioré's insistence that it be built in the same building that housed its predecessors—Prioré's own home. And Prioré could not be forced to tell the technicians how the machine worked, merely how to build it. Further provisions of the contract stipulate that, once the machine is finished, D.G.R.S.T. will be permitted to test it, both from a physicist's and a biologist's point of view. Finally, the contract provides for the government to repossess the components of the machine

if it fails to work. "All but about one hundred thousand dollars' worth of equipment would be reusable in other more conventional devices," Dr. Aigrain explained.

As far as he could determine from his own examination of the Prioré apparatus he looked at, the machine featured, among other things, a vacuum tube containing a plasma of mercury and neon gas. This plasma was apparently subjected to the simultaneous action of a pulsed 9.4 gigahertz electromagnetic wave (one oscillating at 9.4 billion cycles per second, a very short radio wave, indeed) modulated on a high-frequency wave of 17 megahertz (17,000,000 cycles per second). These waves, Dr. Aigrain said, were produced by radio emitters and magnetrons in the presence of a 1000-gauss magnetic field. The experimental animals were maintained during their treatments in this magnetic field through which the radiation had to pass, perhaps becoming mixed or altered in some fashion in the process. He doesn't doubt that there are many other things coming out of the machine as well.

The two physicists who examined the machine under the military contract were described by one French publication as being "absolutely stupefied" by the apparatus, which may safely be interpreted to mean that they understood very little of it. The two, A. J. Berteaud and A. M. Bottreau, were said to have "hovered over" the machine for several months. Bottreau was reported to be "irritated" on occasion by Prioré's smug silence, at other times forgiving. "If he divulged his plans he would have nothing left but to hang himself," Bottreau said on one occasion. Of what significance was the 9.4 GHz wave, whether modulated or not? The two physicists agreed with Prioré's statement: "If it were only that, it would be child's play." Observed Berteaud: "The wave is necessary but not sufficient. It is the base vehicle of something which is still unknown to us." (Indeed, in one experiment where only the 9.4 GHz wave was used, lab animals infected with the trypanosome all died despite prolonged exposure to the radiation. Yet, in another experiment the preponderance of this wave, in proportion to the other, unknown outputs of the machine, was seen to have a critical effect on the speed with which the trypanosomes were overwhelmed by the organism's immunological response mechanisms. And when the wave was omitted entirely from the machine's output no healing could take place.)

At last the time had come to see the machine. The Bordeaux rain was still pouring as Professor Pautrizel and I drove for what seemed miles through late afternoon traffic. As we crept along we communicated as best we could. He said that he believed Prioré was justified in keeping the secret of the machine, that several large concerns were already interested in manufacturing it. How would the new machine differ from the old? There would be much greater

leeway, he said, in "adjusting parameters," and its magnetic field would be ten times stronger than that of the one it replaced. Prioré believed that with the new machine researchers could accomplish "in minutes what had taken hours before." Would new diseases be subjected to the more powerful radiation of the machine? "I hope; but first we must see if it works on the diseases we are already familiar with."

We came to a stop outside a building that appeared to be in need of urban renewal. We rang the bell, and a small child answered. Then another and then a young woman. Was this the right place, I wondered? But of course. These were the inventor's children and his new wife. We stepped inside and the ambience was immediately and radically altered. Everything that wasn't glass and steel and chrome was gleaming white porcelain, white wood and white plastic. Outside, an ancient, crumbling sector of the city; inside, the space age, as Madison Avenue or Antonioni would have conceived it.

I had seen pictures of Prioré and so recognized him immediately when, smiling broadly, he joined us—a short, heavyset man with close-cropped hair and a suit under his lab smock. He took me by the arm and quickly led me down a corridor, with Professor Pautrizel and Madame Cauchois, the translator, who had arrived in her own vehicle, following. The whining of unidentified and still unseen machinery grew more intense with each step. It couldn't be long now. We passed room after gleaming room—all empty. Prioré said something, and Madame Cauchois translated: "That's where the animals will be kept when the new experiments begin. Others will be offices and labs for the doctors." I was instructed to take off my watch; then we stepped down into the very heart of the complex, the lowest level, in which the ray emanates from a five-ton bell-shaped dome suspended from a very high ceiling. What could I say of it, now that I was actually viewing it? There it was. Huge. Inscrutable. Orange. Yes, the dome was painted bright orange. I felt as I approached the eye of it as if I were being tugged by a magnetic wind. My tape recorder gave every indication of wanting to leap from my hands.

"Is it safe?" I shouted. "Oui, oui." I looked straight up the barrel, a glass-lined tube that appeared to be about a foot across. Meanwhile, Prioré was shouting bits of information at me and others, and Madame Cauchois was gamely trying to translate. This piece cost \$5,000, that one \$10,000. It was the best equipment that money could buy. Prioré himself had made trips to the United States to pick up some of what was needed; he couldn't trust others and besides it took too long. On one trip he spent \$300,000. Yes, the machine would cost \$3,000,000, anyway. "Those tubes there," Prioré said, "they're for the oil that cools the machine." We wandered up a flight of stairs; corridors and entryways seemed to beckon in all directions; there were at least three distinct levels and no windows at

all. There—that was from Boston. Here—this came from New York.

There were three large generators, banks of computer-like instruments, exotic switches, the glass tube that penetrated the massive magnetic nozzle

below. There was a "lamp," as Madame Cauchois called it, in which *seventeen* radiations of unspecified nature joined the 9.4 GHz wave. The energy produced by the machine, the entrails of which were everywhere on display—around

corners, upstairs, inside closets—Prioré shouted, existed nowhere "in nature," could be produced by no other machine "on earth." "When will it be done?" I shouted back. "Soon, I hope. In a few months anyway."

By all appearances, the inventor seemed aglow with confidence, goodwill and good health. I asked him how much time he spent under the machine's radiation. "A third of my life," he said. Had he ever been sick? "Never!" He then told me the story I have related of his early experiences with the orange that was, by chance, preserved by the radiation of one of his much earlier apparatuses.

Letter from Europe

AUBERON WAUGH

Continent on the march

Somewhere on the continent of Europe, we are told, there is a "lake" of fifty million gallons of unwanted wine. If I knew where it was, I would tell you, and we might all go and make our contribution toward solving the problem. It is a beautiful thought and one which could inspire several more verses to William Butler Yeats's poem *The Lake Isle of Innisfree*:

"I will arise and go now,
for always night and day
I hear lake water lapping
with low sounds by the shore."

But I haven't been able to find where it is, and the only result of this fabled lake so far has been to provoke a vast demonstration by fifty thousand French winegrowers in the peaceful Languedoc port of Sète.

Sète is an enchanting little harbor town, the burial place of Paul Valéry. Its gastronomic speciality, the *baudroie Sêtoise* (anglerfish in rich sauce) is one of the greatest and least known dishes of France. It is also the main wine importing center, and the winegrowers, with six thousand gendarmes and dreaded C.R.S. riot squad in attendance, were there to close down the port and prevent further wine from being delivered.

They succeeded. After blocking the harbor and threatening to keep roadblocks around the town indefinitely, they made the French government agree to halt further imports of cheap Italian wine. Where Italy is concerned, the embargo is in contravention of France's obligations under the Treaty of Rome, from which French farmers have grown fat these past ten years. The French could reasonably have pointed out that Italian wine is often made from banana skins, airmail letters and picture postcards; that the wines of the Languedoc (Corbières, Minervois, etc.) and Roussillon are much better. Instead, the government merely shrugged its shoulders and said the matter had been taken out of its hands.

Which goes to show how Western governments are no longer in any position to undertake treaty obligations. The wine war is only one of a whole series of happenings of the same description. Possibly they draw their inspiration from the Boston Tea Party of 1773, but it is more fashionable to pretend that they are

something completely new, heralding the end of government as we know it. As the *London Times* concluded somberly in a recent editorial: "As a principle for action it is now widely believed that the sovereign remedy for a sectional grievance is public disruption."

This was commenting on the latest outbreak, a fish war. It started in France, too, where hundreds of fishing boats blockaded all channel ports in protest against low fish prices, demanding a ban on imported fish. They won after closing Le Havre and Boulogne for only three days. Next the British fishermen decided to do the same thing and managed to close fifty British ports by a blockade of twelve hundred fishing boats. They may have been helped by the fact that one of the biggest—the Port of London at Tilbury—had already been closed for three weeks by one of our traditional dockers' strikes.

An interesting feature of this is that an entirely new class has been converted to militancy. The twelve hundred skipper/owners of the fishing vessels are fiercely independent individuals with no union who decided to break the law together. The incident was referred to by a government spokesman as a "company directors' strike." British "workers," as they are still jocularly called, have received so much encouragement to strike from recent socialist legislation (dictated by the union leaders themselves) that they seldom do anything else.

What will happen when there is no more work for them to refuse to do is anyone's guess, but the general feeling is that they are due for a severe identity crisis. It is this sort of consideration which people should take into account when they read that unemployment in Britain is only a third of the U.S. figure. Words like "employment" and "unemployment" have a slightly different meaning over here.

Now I must go and join a demonstration in Parliament Square against the government's proposed self-employment tax. Mrs. Barbara Castle, who is Prime Minister Wilson's secretary of state for social services, has worked out that we self-employed are the least likely group to be able to hit back. We will see her dangling from a lamppost yet. #

How had he arrived at this seemingly magical mixture of rays? "Only twenty-six years of work," he responded. Was it X rays? No, no. Could it be harmful? No, there had never been any adverse side effects, and many of the one thousand mice, one hundred rabbits and four hundred rats had been observed for years after treatment. Many had been bred and had given birth to normal offspring which, in turn, were capable of reproducing normally. What about a simple heat effect? Some skeptics, with more faith in the therapeutic value of heat than I've ever been able to muster, had guessed that some of the results might be attributable to thermal outputs of the machine. But no. Extensive tests had been carried out, measuring the temperature both inside and outside the animals. Nothing. What about the electric bill? "It runs to about four hundred dollars a month."

Had people ever been treated with any of the machines? "A few," Prioré admitted, smiling. Not with the new machine, however; there was a prescription against that. Professor Pautrizel himself had sprained his wrist some time past. It was inflamed sufficiently that it impaired his ability to drive. After ten minutes under the machine, he said, it was normal again. Would the new machine ever be used to treat people? Prioré was confident that the government would permit this, once sufficient animal testing had been concluded.

He was not anticipating having to dismantle the machine, then, of having to give back the various components that he had so lovingly assembled? The inventor's eyes swept over *la machine Prioré* and betrayed not the slightest doubt.

"It will not happen," he said. "The machine is here to stay." #

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