CHAPTER 14

THE BLOOD-SERVICES COMPLEX

Back in America, in the supposedly genteel world of nonprofit blood banking, antagonism had become the order of the day. It is hard to imagine that blood banking, which derived its material from citizen-volunteers rather than from paid donors or from the Third World, could be as cutthroat as the pharmaceutical sector, but the nonprofits competed every bit as fiercely. After all, whole blood represented a resource worth hundreds of millions of dollars—money that traveled from patients or their insurance companies to hospitals and to the blood banks, regardless of their "nonprofit" designation. That the blood banks obtained their resource for free only added an edge to their competition, for the industry's two dominant organizations—the Red Cross and the American Association of Blood Banks—fought not only over business and territory but over the moral high ground as well.

Their public bickering eroded their attempts to present an admirable public image and attract enough voluntary donors to maintain high levels of blood donations. Twice before, the two had unsuccessfully tried to reduce the competition and coordinate their activities. Now, in the 1970s, threatened by public resentment, blood-use inefficiency, and blood-borne hepatitis, they made a third, prolonged try. It would result in the most rancorous failure of all.

The effort began hopefully, as we have seen, when President Nixon, declaring blood "a unique national resource," ordered Elliott Richard-

son's Department of Health, Education, and Welfare to find a better way to manage it. In 1974, the HEW proposed a National Blood Policy, an attempt to reform and unify the blood system without resorting to federal control. The policy included a list of ten goals to increase the safety and efficiency of blood use—such as eliminating paid donors, setting up efficient blood-supply regions, finding better ways of sharing blood, and establishing uniform practices—and left it to the industry to devise a way to achieve them. Richardson's successor, Caspar W. Weinberger, a non-nonsense bureaucrat who later became secretary of defense, initiated the policy, pleading with the blood bankers to come up with a plan. They, in turn, founded the American Blood Commission, a nonprofit voluntary body, to serve as a forum for all blood-related debates, and to issue decisions that members would voluntarily follow. Modeled on the United Nations, the commission was designed to be broadly inclusive, comprising forty-three organizations, including blood bankers, plasma dealers, medical societies, consumer groups, labor unions—almost any group that had anything to say about blood. The hope was that the blood industry, meeting voluntarily, would formulate policies to eliminate the problems of waste, shortfalls, and blood-borne hepatitis.

The inaugural meeting took place at the Statler Hilton Hotel in Washington, D.C. Announced with great fanfare as "the most significant, non-scientific development in blood services in the United States since World War II," it was chaired by a management consultant named John J. Corson. Corson could see the job that lay before him, and, in an impassioned invocation, he exhorted the participants to rise above self-interest and "think for a moment" what their efforts could mean. "Think about what it can mean to the rank and file citizen who may face an urgent need for safe blood tomorrow, next week or next year. Think, please, what it can mean to the anemic, the hemophiliac, the leukemic, whose need for blood is relentless. . . . Surely, in 1975 you and I can recognize that even as no man is an island, no blood bank can or should operate in regal independence. We live in a compact society. . . ."

Everyone recognized the nobility of the sentiments, the call for a cause greater than their own—and immediately started arguing. As the years passed and one quarterly meeting gave way to the next, almost everyone in the American Blood Commission became furious with everyone else. Delegates recall walkouts, and red-faced representatives sputtering in frustration. "In a word, it was hostile," remembered Dr. Byron Myhre, chief of clinical pathology at the Harbor-UCLA Medical Center and a past president of the AABB. "I remember screaming

matches. . . ." One major player, the American Blood Resources Association (ABRA), the trade group for the plasma industry, took an even more intransigent stance, and unsuccessfully sued Weinberger to dismantle the body.

One might wonder why the nonprofit blood bankers could not drop their hostilities and move forward. But this feud had been simmering for decades, ever since the beginning of mass blood banking in America, when the Red Cross announced its intention to monopolize blood collection and the AABB decided to resist. The Red Cross had grown mightily over the years. Operating from its headquarters in Washington, the elegant "Marble Palace" near the White House, the organization managed eighty-one blood centers in fifty-seven regions throughout the United States, not counting its mobile collection vehicles. The Red Cross collected more than half the blood used in America, or more than five million units a year. And despite the agency's nonprofit status, these collections translated into serious money. Even though the organization eschewed "profits" as such, it did not hold itself above collecting "processing fees." In 1972, the Red Cross's board of governors mandated its first rise in processing fees, in order to reduce the blood program's debt. The increases continued, and by 1977 the blood program's annual income—"excesses of revenue over expenditures," was how they put it—increased to more than $9 million. (That number would rise to $27 million by 1983.)

Such money and power frightened Bernice Hemphill, the founder and leader of the AABB. In truth, her group was not the underdog that she portrayed it to be. The AABB's more than two thousand members—hospitals and independent and community blood banks—collected more than 35 percent of all the blood used in the country. Acting as a trade organization, the group set standards, ran inspection programs, and held annual conferences attracting thousands of doctors. It also maintained the National Blood Clearinghouse—the national accounting center through which member institutions could exchange blood and blood credits. Yet she worried about the Red Cross's monolithic ambitions and its ability to wield power. In 1960, for example, the Red Cross reached a "statement of understanding" with the AFL-CIO, which lined up millions of union members to provide blood donors for the Red Cross and support for its policies. Later it would find an ally in the United Auto Workers. That kind of power, linked with the Red Cross's oft-stated goal to be the "total blood supplier to the nation," made the leaders of the AABB jump every time the Red Cross so much as twitched.

This struggle for dominance between the two nonprofit blood-banking giants turned what should have been a series of practical concerns about collecting adequate resources into a drawn-out and wasteful moral crusade. Nowhere was this clearer than in the imbroglio over the nonreplacement fee. This was the charge that AABB members would levy against those patients who did not arrange to replace the blood that they used. In practical terms, not much difference existed between those blood banks that employed the fee and those that did not—patients paid about the same for their blood. The two groups even used similar recruitment campaigns—give blood today so that you or a loved one can use it tomorrow. The blood bankers, however, acted as if the contrast in their philosophies made all the difference in the world.

Less than 5 percent of the qualified American public donated blood, which left blood banks continually begging. (In contrast, European nations, with their less transient populations, generally had donor rates of 10 percent or greater.) In order to address the donor-recruitment problem, the commission appointed a task force, which studied nine blood banks throughout the United States—six of which employed nonreplacement fees and three of which did not. Factually speaking, their study was inconclusive: All nine of the blood banks, whether they favored the AABB or the Red Cross philosophy, recruited donors with similar success. But the task-force members, most of whom favored the Red Cross, injected politics into the discussion. In the end, they presented an inflammatory document, concluding that charging nonreplacement fees was "tantamount to selling blood," and urging all blood banks to abandon it.

The findings struck Hemphill like a blow. "I had high hopes that the task force study would bring out the more salient facts about how to motivate donors," she told an American Blood Commission board-of-directors meeting in September 1977, but "such data had not been produced." In a minority report, she argued that the task force had found no factual basis for rejecting her philosophy of individual responsibility. She cited her own blood bank's thirty-six-year "heritage" of successfully using the nonreplacement fee as proof that it could work. At the same time, she supported the Red Cross's right to practice community responsibility in regions where it had proved effective. The whole point was that *either* doctrine could succeed, depending on the experience of blood banks in their region. "I am for pluralism in [donor] recruitment," she argued, ". . . freedom and the right of choice." She saw the task-force report as the Red Cross's attempt to crush the AABB

and its allies, putting an end to the multiple blood systems in America, and uniting them all under the American Red Cross.

The tumultuous commission meetings reflected a much broader war for donors and territory. The first shot had been fired in 1976, when the Red Cross summarily withdrew from the AABB's clearinghouse, with which it had cooperated for sixteen years. The situation had seemed harmonious at first, with the two organizations exchanging blood and blood credits—"a big happy family," as Hemphill recalled it. But over the years the Red Cross ran up a debt, having borrowed more blood from the clearinghouse than it returned. Under the rules, it could repay what it owed in blood or money, but the Red Cross insisted on paying only in blood. The agency could not collect enough blood to meet its own needs, much less the demands of the clearinghouse, and its deficit rose steadily. By the time of its withdrawal—strictly on principle, according to the press releases—the Red Cross owed the clearinghouse more than thirty-seven thousand units of blood, or the cash equivalent of about $300,000.

The Red Cross's sudden withdrawal confused and disturbed people. Over the years, many had given blood to the American Red Cross in order to build blood credits for themselves or their relatives living in areas served by the AABB. When the Red Cross withdrew, those donors' hard-earned credits were immediately wiped out. In one case, a retired army colonel named Melvin W. Ormes of Philadelphia had been giving to the Red Cross for twenty-five years, assuming his blood went into the national exchange. Sometime after the Red Cross pulled out, his wife underwent surgery, transfused with blood from a blood bank that belonged to the AABB clearinghouse. "We believed . . . we would be entitled to a cost reduction or an exchange," he told a congressional hearing. Instead he met with an unpleasant surprise—a blood charge of nearly $2,000.

The withdrawal caused a blot on the public image of blood banking, which Hemphill was quick to exploit. She organized a campaign to persuade the Red Cross to reverse its position, charging that the agency was "turning its back" on the thousands of donors who took part in the exchange. She publicized a letter she wrote Red Cross President George M. Elsey, saying that the withdrawal would lead to a "fragmentation of the nation's blood banking complex at a time when both organizations should be working cooperatively. . . ." Finally, in a move of unusual audacity, she urged donors living in areas served by the Red Cross to seek out AABB-affiliated blood banks instead.

The Red Cross was furious. Seeing her campaign as unwarranted and irresponsible, Robert G. Wick, the Red Cross's vice-president,

wrote a letter of complaint to the American Blood Commission. The only real threat to the blood supply, he charged, was "the confusion and anxiety that Mrs. Hemphill is spreading in her attempt to bring public pressure on the Red Cross to stay in the Clearinghouse. . . ." The Red Cross dispatched one of its top managers to Los Angeles to revive the city's failing Red Cross center so it could compete with Hemphill's for dominance in California. "If we can prove it to the country that we can do it in Los Angeles," the administrator, Norman J. Kear, wrote in a memo, "a major battle for our entire program will have been won."

Others found more devious ways to strike at Hemphill and her blood bank in San Francisco, often called the AABB's "mother ship." Several Red Cross advocates in California goaded the state's young consumer-affairs commissioner into charging the Irwin Memorial Blood Bank and Hemphill with profiteering from donated blood. All the charges were eventually dismissed, but fighting them cost Irwin an estimated $700,000 and a temporary loss, through adverse publicity, of six thousand blood donors.

One cannot ignore the confusion such tactics must have imposed on the public. In explaining America's traditionally low donor rates, apologists for the industry often cite the nation's transient, multiethnic society, in which individuals feel little connection to the collective. That may be so. But one must also consider the lack of faith the blood bankers engendered in their shifting policies and unseemly competition. As Alvin Drake, a Massachusetts Institute of Technology systems-engineering professor who studied the blood system, told Congress in 1979, the "fractured nature of blood collection messages and efforts" made it difficult for people to acquire "consistent blood donation opportunities and habits." Such habits would require a steady, dependable approach to collections, in which blood donation became "a simple, routine, satisfying part of life." But blood bankers forced themselves into a crisis mentality, and cried wolf to maintain a sufficient supply—which would itself eventually prove self-defeating.

It was all such a mess. As the furor continued to roil in California, the American Blood Commission held several more meetings to discuss the task-force report, each more acrimonious than the preceding one. Finally, they voted to phase out the nonreplacement fee and unite all blood collection under the Red Cross's doctrine of community responsibility. Truth be told, the decision meant nothing, since the commission had been given no enforcement powers. Blood bankers simply ignored the decision and continued doing business as before. Aside from causing enmity, the proceedings had no other effect.

By the late 1970s, the American Blood Commission lay in ruins. Examining the failure, the General Accounting Office cited the "disagreement between the two largest blood suppliers" as a principal cause. In 1979, Senator Richard Schweiker made one more attempt to settle the dispute. He pushed for a law that would unify the blood system under a single nonprofit national blood exchange, open to all blood centers but supervised by the government. Like those who had come before in such efforts, he failed. Meanwhile, a chastened blood industry promised to reinvigorate the American Blood Commission and honor its pronouncements. But the commission died a long and insignificant death.

And so the old pattern continued: Two groups performing genuinely good work for the American public found it impossible to get along. Only later, when they faced a common enemy in AIDS, did they learn to cooperate—and then temporarily. Their lasting failure to join peacefully in recruiting donors has contributed to paralyzing shortages, even in some cases today.

It was outside the commission that the important advances in blood safety were taking place, especially in the control of hepatitis. In 1964, Dr. Baruch Blumberg, of the National Institutes of Health, had discovered a particle associated with the surface coating of the hepatitis B virus which, after a few weeks, triggered an antibody response. His work eventually led to a test for the antibodies that could screen donors who carried the disease. The test, mandated by the FDA in 1972, was only about 15 percent effective. A subsequent test, required by the government in 1975, screened with about 40 percent effectiveness. The majority of infected units were still getting through, but a start had been made in controlling the virus.

Meanwhile, a debate was taking place on other methods of protecting the nation's blood supply. For years, scientists like J. Garrott Allen had argued that one group in particular tended to carry a high risk for hepatitis—donors whose circumstances required them to sell their plasma or blood. Studies had shown that paid donors had hepatitis as much as three times more frequently than volunteers. Allen and others argued that removing paid donors would be the single most effective way to reduce the disease.

As straightforward as it sounded, a ban would be difficult. The plasma industry depended on remunerated donors, since few people volunteered for plasmapheresis. (It may not have been an attractive arrangement, but it was the only way to obtain sufficient plasma; wit-

ness the plasma deficits of Europe and Canada.) The AABB objected to a ban because some of its member centers relied on paid donors during shortages.

There was also some counterevidence to consider. Dr. Howard Taswell, who ran the Mayo Clinic blood bank, one of the nation's best-run and most hepatitis-free, argued that paying his donors had enabled him to demand the highest levels of professionalism and commitment. His staff knew donors personally and had been tracking their health histories for years. That was the secret to safe blood, he contended—not the moral aspect of voluntary giving, but the practical ones of close contact with donors and a thorough knowledge of their health. Others would argue that Taswell worked in an unrealistically ideal situation: Located in central Minnesota, his center drew from a homogenous, stable, and healthy group of donors. He could never do the same in Los Angeles or New York, with their huge and transient populations with generally higher disease rates. Blood bankers there felt that banning paid donors would help them eliminate the most likely carriers.

The debates over paid blood rumbled for years. Finally, in 1978, the FDA chose a surprisingly prescient compromise position. The agency required blood banks and plasma collectors simply to label their blood bags as "paid" or "volunteer," and let the marketplace accomplish the rest. Almost overnight, paid blood disappeared, since no hospital would buy blood that was implicitly inferior. (The fractionators continued using paid donors as before, screening the plasma with laboratory tests.)

Within just a few years, the hepatitis B rates plummeted. But the reduction of the B virus removed the mask from another lurking pathogen. Detection rates began climbing for another form of hepatitis—a mysterious strain called "non-A non-B" which, later renamed hepatitis C, was found to cause 90 percent of post-transfusion hepatitis cases. In 1984 alone the new virus infected an estimated 180,000 transfusion recipients, killing an estimated 1 percent of them. Among those who would die of the disease was the entertainer Danny Kaye. In retrospect, if there was a lesson learned from the hepatitis B story, it was not that a virus could be cleverly defeated, but that another would inevitably rise to take its place.

As the whole-blood collectors fell into disarray, the plasma industry consolidated as never before. Drug companies had learned from their experience in Nicaragua not to entrust collections to shady middle-

men—especially in marginal, unstable nations—so they took direct control of the resource. By the late 1970s, major drug companies had bought out almost a third of the nearly four hundred collection centers in America. National plasma chains owned most of the remainder—organizations such as North American Biologicals, Inc. (NABI), the world's largest collector of source plasma. The wildcat collector had become a fixture of the past.

Yet, if the concentration of resources bought more professionalism, it proved unsettling in other ways. Four major companies had controlled most of the world's plasma. Based in the U.S., they included Cutter Laboratories of Berkeley, California; Alpha Therapeutic Corporation of Los Angeles; Armour Laboratories of Chicago; and Hyland in a suburb of Los Angeles. These firms represented a pharmaceutical tradition. Armour, as we have seen, had been around since the previous century, having spun off from the nationally known meatpacking business. For generations the firm had made animal-based pharmaceuticals, before helping Edwin Cohn kick-start the American biologics industry. Cutter, an old family business in northern California, boasted a colorful history of public involvement dating back to the earthquake of 1906, when the company provided tetanus and diphtheria antitoxins to the people of San Francisco. They too became one of the original fractionators under Cohn.

Now, with the Third World plasma mills shut down and rising fears of a worldwide "plasma crunch," foreign firms, eager to gain direct access to plasma and entry into the lucrative American drug market, began taking over the American producers. In 1978, Dr. Naito's Green Cross Company of Japan bought Alpha Therapeutic—a sensible move, since Japan used more fractionation products than any other nation yet collected less than half its needs domestically. Later Green Cross bought 50 percent of the Spanish fractionator Grifols, which American plasma also supplied. In 1977, Bayer AG, the German pharmaceutical giant, had taken over Cutter Laboratories. Armour passed from one owner to another until the French multinational Rhone-Poulenc held on to it. Of the major producers, only one remained in the hands of Americans—Hyland, which itself had been purchased by Baxter Travenol Laboratories, a multinational health-care conglomerate based in Chicago.

The Austrian fractionator Immuno bought an old Parke-Davis fractionation plant in upstate New York, along with a chain of more than a dozen collection centers. Tom Hecht, owner of Continental Cryosan, of Montreal, purchased NABI and its chain of plasma-collection cen-

ters in order to supply his international brokerage. Later he sold the chain to the Institut Mérieux of France, which was looking for new sources of material.

More than ever, plasma was becoming an integrated resource, mixed and distributed all over the world. A clue to the extent of that integration can be found in a diagram of the Cutter Laboratories network as it existed in 1978. Prepared by John "Newt" Ashworth, Cutter's vice-president of scientific affairs in the international division, the map is a maze of boxes and lines, as complex as an electrician's schematic and sprawling over a sheet of paper the size of a page from *The New York Times.* Most of the lines converge at a box labeled "Cutter Berkeley + Clayton." This was the hub of Cutter's global network—the company's main laboratories in California and North Carolina. Source plasma flowed to these laboratories from plasmapheresis centers throughout the United States, from sources as varied as prisons and college towns. After several months in the manufacturing pipeline, the material emerged as a variety of products, including albumin, two kinds of gamma globulin, and Factor VIII. These products traveled to Cutter distributors in America, Great Britain, and Japan. Cutter sent intermediate powders—unfinished forms of albumin and gamma globulin—to the Cutter subsidiary in Germany for further processing. It sent other plasma fractions to unaffiliated drug companies in Sweden and Canada.

Germany occupies the next-most-cluttered part of the diagram. There a Cutter subsidiary called Tropon received powders from America, source plasma from centers in the U.S. and Germany, and cryoprecipitate from Cutter in Mexico. Plastic plasma bags arrived from Cutter subsidiaries in the U.S., Puerto Rico, and Canada. Tropon in turn sent out albumin, Factor VIII, and gamma globulins.

Near the bottom of the diagram sits Cutter in Mexico, which shipped cryoprecipitate to Germany and Japan and finished products to South America. Farther below rests the Australian affiliate, which provided Cutter U.K. with plastic bags. North on the diagram sits Cutter of Canada, which sent bags to Germany and the Canadian Red Cross. Finally, hovering around the periphery of the diagram are various boxes with the names Behring, Biotest, Immuno, and Mérieux. They indicate Cutter's trade relationships with diverse companies in Germany, Austria, and France.

"The point is, this was not unique to Cutter," Ashworth explained many years later. "Everybody could have a map just like this." Complicating his diagram and that of other companies was the fact that prices

and quantities of individual plasma components fluctuated, as supply and demand changed from one country to the next. So it would be better to see this map not as a static web but almost as a global circulatory system, its fluids pumping this way and that, to the zones of greatest profit and demand.

In contrast to plasma, blood tended not to travel internationally. Remember that red cells perish more easily than plasma, which makes them unsuitable for long-term storage and trade. Within American borders, however, a lively exchange in whole blood took place. The routes are too complex and fleeting to chart, because, in addition to working through their organization's clearinghouses, the directors of blood centers made countless *ad hoc* arrangements to get the quantities and blood types they needed.

Given the charitable nature of blood giving, it was surprising how businesslike these arrangements could become. Blood centers with an excess of blood found they could charge whatever they wanted to those facing shortages. Bidding wars could occur when certain blood types entered periods of particular demand. Some nonprofit blood banks found it so lucrative to sell to others that they collected more than their communities needed, staging "blood-crisis" campaigns to drive up donations without telling citizens about their true intent. Some tactics seemed to have nothing to do with charity. One, called "bundling" or "tying," involved linking two blood types in a single transaction, forcing a blood bank that needed certain blood types to buy others it did not need as a condition of the sale. Because "nonprofit" status precludes organizations from paying dividends to owners or shareholders, the money generally went into augmenting facilities, salaries, and the blood banks' savings accounts.

Many of these arrangements were later revealed by reporter Gilbert Gaul in a Pulitzer Prize–winning series in the Philadelphia *Inquirer* in 1989. Gaul's revelations and those of subsequent congressional hearings scandalized the public, a reaction that blood bankers could not understand. After all, *they* knew they were trading in a resource; didn't the public see it that way as well? The public, of course, had no such understanding, having been schooled by the nonprofit blood bankers in the ethos of strict noncommercialism.

One other small but important trade route deserves mention. Amid the rivers of plasma leaving America ran a countercurrent of blood from Europe to New York. Despite the dominance of commercial plasma-processing companies, several European nations maintained fractionation laboratories run by their governments or national Red Crosses. They obtained their source material the old-fashioned way—

bleeding volunteers, centrifuging the liquid, and saving the plasma. This gave them an excess of red cells, which they unthinkingly poured down the drain.

Dr. Aaron Kellner, the enterprising director of the New York Blood Center, witnessed this practice on a visit to colleagues in Amsterdam, when he noticed a tube running from their plasma-separation unit down to a drain. "What's going down there?" he asked. "Oh, that's the blood," his Dutch host replied. "We don't need it; we're discarding it."

Kellner was thunderstruck. And then, "like in the cartoons, an electric light went on right over my head," he later recalled. "I suddenly realized that here we were struggling in New York . . . and these fellows were throwing away these marvelous goodies."

Kellner offered to buy the wasted red cells, but after a year of negotiation the deal fell through. So he traveled to France, where he met with Dr. Jean Pierre Soulier, director of the Centre National de Transfusion Sanguine (CNTS) in Paris. Soulier was intrigued by Kellner's proposal, but, given the French ethos of benevolent blood giving, he could never consent to trade blood for money—although he might be able to trade it for blood bags and equipment. Kellner waited months for a response, only to be disappointed in the end. The decision had gone all the way to President de Gaulle, according to Kellner, "who said in a few very carefully chosen words that he would be damned if he would send good French blood to those blank-blank people in the United States."

Finally, Kellner traveled to Switzerland. There he sought out a blood banker as unfettered and resourceful as himself—Dr. Alfred Haessig, director of the Swiss Red Cross Central Laboratory. Haessig had established a fractionation center in Bern that, owned and operated by the Swiss Red Cross, obtained all its plasma from volunteers. Like his colleagues elsewhere in Europe, he poured thousand of gallons of red cells down the drain.

Kellner and Haessig shared a sense of entrepreneurship, a feeling that, despite their insistence on nonpayment of donors, blood should be used in the most intelligent, practical, and profitable way. They saw no conflict between nonprofit blood banking and the principles of good business. So it did not take them long to reach an agreement in which Haessig's employees, paid by the New York Blood Center and working under the Center's FDA license, would bleed volunteers, spin off the plasma, and ship the red cells to New York.

During the first year of the program, 1973, Kellner imported about twenty-two thousand units from Switzerland, or about 6 percent of his center's supply. Germany, Belgium, and Holland joined the program.

Some doctors predicted that their older Jewish patients would never accept German blood (a concern that never materialized); other New Yorkers distrusted the idea. "It's a stinking shame that we have to depend on Europeans to lend us blood," said New York City's outspoken mayor, Edward Koch. Yet Euroblood, as Kellner liked to call the material, was a notion whose time had come. Soon Kellner was importing more than a quarter of a million units per year, more than a third of New York City's supply. Kellner was receiving so much blood from Europe that he faced a glut rather than a deficit, and shared it with Los Angeles, New Orleans, and Chicago; although he had to stop sending to those centers when the Red Cross decided that as a matter of policy they should strive for self-sufficiency instead. Kellner took a more practical approach: "You do what you have to do in order to get the job done."

Haessig, for his part, was delighted with the results. The program brought money, and saved him the potential embarrassment of being seen to pour precious Swiss blood down the drain. The Swiss Red Cross began shipping red cells to Greece, where an endemic condition called "Mediterranean anemia" caused permanent shortages, and to needy nations in North Africa and the Middle East. Meanwhile, the managers of Central Laboratory found new ways to earn money. From plasma, they derived a form of gamma globulin that could be administered intravenously instead of by injection into the muscle—a more effective means of administration for which the Swiss Red Cross, for a short time, held a monopoly. To market the material, they formed a partnership with the Swiss drug company Sandoz. The two deals involving Sandoz and Euroblood proved so profitable that the Swiss Red Cross built a new central laboratory in Bern.

Kellner and Haessig were not alone. A new generation of blood bankers was arising who, though preaching the principles of nonremuneration, appreciated the value of blood as a commodity. In Germany, Dr. Waldemar Schneider, director of the Red Cross's Westphalian regional blood service, and Dr. Heinz Schmitt of the Lower Saxony region both marketed plasma products to compete with the imports. West German tax authorities felt that this commerce strayed beyond the bounds of the Red Cross's nonprofit status, and so revoked tax-exempt status for moneys received from the plasma operation.

In France, an entrepreneurial blood banker named Dr. Michel Garretta was rising through the ranks of CNTS to take over from the donnish Soulier. French imports of Factor VIII were hovering around 20 percent—a figure that, given the French passion for self-sufficiency, embarrassed the Ministry of Health. The government built a new frac-

tionation plant outside Paris, and instructed Garretta to increase the production. At the same time, he was told to phase out the foreign blood products, something he had the power to do because, among the seven regional fractionation centers in France, Paris alone could authorize imports. Clearly Garretta was the man for the job, having studied management as well as medicine. Assuming the role of commercial-operations director, he vowed to make blood an "industrial" resource. He would rival the multinationals for European dominance.

Even as the Health Ministry was boosting its own blood centers, especially the one in Paris, it moved to eliminate competition. Since 1952, the privately owned Institut Mérieux in Lyon had been collecting plasma from its four plasmapheresis centers to produce albumin, gamma globulins, and vaccines for the French market. In the late 1970s, the Health Ministry, increasingly militant about nonremuneration, ordered the company to close the four centers and banned it from selling products within France. Henceforth it could import placentas and source plasma, but it would have to export all the products it made. From that point forward, the government-run system of Blood Transfusion Centers (CTS, or Centres de Transfusion Sanguine) had become a monopoly, with inordinate power resting with the "national" regional center in Paris, CNTS.

In America, several people within the Red Cross—including its president, George Elsey, and vice-president and blood-program director, Dr. Lewellys F. Barker—realized that, despite the agency's nonprofit orientation, they would have to manage blood in a businesslike way. We have seen how the Red Cross earned millions in the collection and distribution of red cells. Centrifuging the red cells of millions of volunteers left them with huge excesses of plasma, which they arranged to have fractionated under contracts with companies such as Hyland and Armour. The arrangement proved lucrative. In 1977, for example, the Red Cross paid an estimated $9.1 million to fractionate excess plasma that it later sold for more than three times that amount. Indeed, the plasma market proved so rich for the Red Cross that the agency made plans to build its own fractionation plant in conjunction with Hyland—a move that, given the organization's tax-exempt status, would have destroyed its competitors, commercial and nonprofit alike. "We're not after anyone's share of the market," Wick told *Business Week,* a remark that was sure to put no one at ease. The plan never materialized, but, with an estimated 15 to 30 percent of the nation's raw plasma, the nonprofit Red Cross maintained a powerful presence in the commercial marketplace.

In Canada, a strengthening current of entrepreneurship was eroding

the old partnership between the Red Cross and Connaught Laboratories. Most Canadian hospitals at the time purchased clotting factors on the open market, since Connaught lacked the technology to produce it. But the Red Cross still relied on Connaught for albumin, gamma globulins, and other derivatives of the plasma of Canadian volunteers. The facility was aging badly, however: By 1974, it was losing 50 percent of the Red Cross's plasma to bacterial contamination.

In 1972, the University of Toronto sold the laboratory to private ownership. Later the Red Cross learned that, in order to bolster its financial condition, Connaught's managers had secretly been selling Red Cross material to plasma brokers for foreign distribution. One year was particularly galling: In 1974, when Canada was experiencing a shortage of albumin, Connaught sold $500,000 worth of products derived from the Red Cross's plasma. Disillusioned with the laboratory, the Red Cross applied for government funding to build its own fractionation lab and take charge of the nation's fractionation. Not to be frozen out of the business, Connaught applied for and received government approval to produce Factor VIII. The company also proposed to construct its own new fractionation plant, paid for with government funds.

Now that the old alliance was broken, the provincial governments got into the fray, vying to host a profitable and publicly funded business. After extensive negotiations, the provinces' health ministers agreed to build a network of three fractionation plants, in Ontario, Winnipeg, and Manitoba. The plants would be owned by private companies, including Connaught, but operated as nonprofits. Trumpeted as the key to Canadian self-sufficiency, the scheme had one astonishing deficiency: In focusing on the moneymaking *processing* of plasma, the ministers ignored the issue of supply. The Canadian Red Cross had never been able to collect enough plasma to feed even one plant, let alone three. Despite tens of millions of dollars expended, the plan was never brought to completion. Eventually Connaught updated its facility, but imported much of its source plasma from America. Indeed, throughout the 1970s and '80s, at least half the plasma products circulating in Canada originated from paid American donors.

This, then, was the blood-services complex on the eve of the AIDS epidemic. Whole blood, with the exception of Euroblood, generally remained within national boundaries, although in America that encompassed quite a bit of territory and regional exchange. Plasma and its derivatives traveled globally, with the United States serving as the most important source. Within the U.S., plasma came from a variety of

sources, from colleges to prisons to indigent neighborhoods. Homosexuals also became an important source. Because gays had high rates of hepatitis, the drug companies valued their plasma for hepatitis antibodies. Before isolating the antibodies, the fractionators would "skim" off the cryoprecipitate and use it to produce clotting factors. This practice was not thought to spread hepatitis, since antibodies in the plasma neutralized the disease. What it did do, though, was selectively include plasma from high-risk populations—who were apt to carry other viruses as well—into the world's clotting-factor supply.

By the late 1970s, the blood-services complex had become an interlocking network that mingled the blood and plasma of millions of people who lived in regions thousands of miles apart. Generally this intermingling proved beneficial: More people received lifesaving blood products than ever before. But the distribution also bore peril. Integrating the world's blood products network did more than increase the efficiency of supply—it established optimal conditions for the spread of emerging viruses. America, as we have seen, was the OPEC of plasma. This meant that almost anyone in the Western world or Japan who received plasma-based medication made intimate contact with American donors, most of them professional donors living in the nation's hot zones for disease. For people who received large quantities of medicine—mainly hemophiliacs—the contact with tainted blood products was becoming inevitable.