Appendix B
A Brief History of SRI

Though much of this history is based on material referenced in the ongoing endnotes and footnotes, some, beginning with SRI's separation from Stanford University, comes from the author's own research and impressions. It does not represent an official position by either SRI or the University.

Stanford Creates a Research Institute

Stanford Research Institute, or SRI, was founded as a subsidiary of Stanford University to pursue goals the University had in common with industry in the western United States. SRI's Articles of Incorporation, or its Charter, which were drafted in autumn 1946, indicated that the Institute's mission fell within the broad purposes of the University. Two of the provisions in the University's Founding Grant were relevant to the new Institute:

> *to assist, by experimentation and research, in the advancement of useful knowledge and in the dissemination and practical application of same*
>
> and
>
> *the public at large, not alone the comparatively few students who can attend the University, are the chief and ultimate beneficiaries of Stanford University.*

Thus, in the abstract, the Institute was to operate very much in accord with Stanford's original aims. The University's direct influence was stipulated in SRI's Charter; namely, that the University Trustees would be the general members of the SRI corporation and elect the Institute's directors; that SRI would promote the educational aims of Stanford; and that, should the Institute ever be dissolved, SRI's net assets would be transferred to the University.

The beginning of SRI was the consequence of the creative dynamics of perhaps a dozen people. However, arriving at an alignment of purpose was anything but simple. At least three, and perhaps four, independent groups or players played a part in SRI's genesis. These separate entities first looked not to Stanford's Charter but at the need for a research enterprise in the Far Western United States, one that would operate under the aegis of a university. Most of this unfolding is well documented in the first of two volumes on the early days of SRI by Weldon B. Gibson, who was known locally as well as internationally as Hoot.[A]

The earliest of these groups consisted of two Stanford chemistry professors with administrative roles, Robert Swain and Philip Leighton, and a prominent alumnus, Dudley Swim. Swain, who would serve briefly as acting president of Stanford during the tenure of Ray Lyman Wilbur, began discussions about a University research institute as early as the 1920s. The three issued a concrete proposition in late 1942, but it was not until after World War II that interest in the idea intensified. In the late summer of 1945, after informal discussions with Stanford President Donald B. Tresidder, they formally submitted to him their concept for an institute at Stanford.[1] Tresidder reacted with interest, and within 2 weeks he had dispatched Leighton and Swim on a tour of Eastern U.S. research institutes. Around that time two separate groups of industrialists were working on a similar idea.

One of those initiatives was by a group of three Southern California industrialists, who in July-August 1945 conceived of a Western applied research organization they called the "Pacific Research Foundation." The group consisted of Maurice Nelles, Morlan A. Visel, and Ernest L. Black, all executives of Lockheed in Burbank, California. Having heard of a similar interest in the Bay Area, Black presented

[1] Interestingly, Swim and the others thought the Institute ought to have two major thrusts: "consulting and research and patent development for its own account." The former, at least in the form of management consulting, was discouraged by the University in the early days of SRI, and royalty or patent-based income, with a very few exceptions, did not become a principal focus for SRI until the early 1990s. In a chronology of Stanford/SRI history compiled in January 1995 by lawyer Kirke Hasson (Pillsbury, Madison, and Sutro), the Swain committee also recommended that half of SRI's "annual earnings" go to Stanford.

their proposition to the third—and the most effective group—which was led by San Francisco industrialist Atholl McBean. In spite of two, perhaps more, developed concepts for a research institute, it was McBean who gained the ear of Stanford's Vice President for Development, Alvin Eurich and, in turn, that of Tresidder. Before the end of 1945, McBean, with encouragement and financial support from other Northern California executives, won the support of Tresidder and Eurich that eventually brought SRI into existence.

Another person whose ideas had an important impact on the type of organization SRI became was Henry T. Heald, president of the Illinois Institute of Technology and later president of the Ford Foundation. The San Francisco industrial group had asked Heald to visit a variety of university and industry research facilities on the West Coast and to make recommendations about a possible new research institute in the West. Following an 8-day tour of the region, he met with the group in San Francisco on January 24, 1946, and they concluded that an industrial research institute on the West Coast was needed.

In a short, 900-word report, Heald fairly well described what SRI would come to be: He indicated the need for an institute that would engage in high-quality industrial research for individual companies, associations of companies, and government agencies at all levels. He stated that the institute must have a first-class staff and adequate space and facilities. The final recommendations were clear and to the point:

> "it is strongly recommended that a research foundation…. be developed on the Pacific Coast…located at and operated in close affiliation with Stanford University."
>
> "…industrialists interested in the establishment of a research organization [should] ask Stanford University to organize it, provide the University moral support…and…an initial gift of $500,000."
>
> "…the Foundation [should] be organized as a separate corporation with trustees including several members of the Stanford Board…. The President of Stanford, or some other chief administrative officer, should be president of the Foundation."

Heald also advised the business leaders to move quickly to begin the organization, leaving its future nature to be determined by subsequent events.[B]

Within a month of Heald's report the Stanford trustees agreed in principle to create Stanford Research Institute. Tresidder then asked the University's counsel Morris M. Doyle to draft a charter and the search began for an Institute Director. The degree to which the efforts of the other, earlier parties influenced the ultimate definition of SRI is hard to gauge, but the propositions clearly converged in the Office of the President where the final structure of SRI was defined. The faculty committee's recommendations that the Institute be nonprofit, that a contractual arrangement allow the University to control the Institute, and that it have a range of activities from basic to applied industrial research that would help strengthen University-industry relationships were enacted. Thus, out of this somewhat chaotic genesis, SRI emerged as a separate organization, a nonprofit subsidiary of Stanford University.

Stanford's Dean of Engineering, Fred Terman, was also sympathetic to an applied research organization tied closely to science and technology. His notion, however, centered more on providing a place where faculty and students could pursue their own interests as opposed to those of Western industry. Terman was seeking to bring more science into the engineering part of Stanford and hoped that a new institute could support that goal. Though Tresidder did not implement Terman's desire for such close University ties, Terman did help attract some of the early Institute's talent and urged them to enter the emerging field of electronics.[2]

Papers for the incorporation of SRI were filed with the State of California in November 1946 and the University trustees accepted the charter the following month. Stanford thus formed SRI and the president of the University became the chairman of SRI's Board of

[2] Stewart Gillmor, Terman's biographer, indicates that Terman was also interested in a research institute that would work closely as an applied technology arm of his part of the University. According to a conversation with Gillmor in June 2000, Terman urged Jesse Hobson and Ralph Krause, both early and pivotal SRI leaders, to come to SRI. Terman also permitted some sharing of Engineering faculty ideas with SRI and also made some joint faculty/SRI appointments. Gillmor's book, *Fred Terman at Stanford* was published by Stanford University Press in October 2004.

Directors, first Donald B. Tresidder, then Acting President Alvin C. Eurich, followed by J. E. Wallace Sterling. Eurich, who was also the University's director of development, became vice chairman of SRI's Board, indicating that, at least at that moment, the University viewed SRI as integrally tied to its own growth.[3]

The new SRI Board consisted of 32 prestigious Western executives.[4] In less than 2 years, SRI also formed a council of SRI Associates, additional business leaders with some interest in SRI, to help underwrite the Institute and build connections between it and the industrial community. A 1950 report to the Board indicated that of its industrial (commercial) work, 68% came from California, 13% from other western states, and the remainder from other parts of the country. Furthermore, some 75% was industrial and 25% governmental.[C] Thus, the early linkages forged were indeed with industry. But these, as it turned out, were never enough to sustain SRI's growth, and government work was needed from the outset.

In spite of the University's preference for industrial work, SRI's dependence on government sponsorship began essentially at once. A passage from the Institute's first annual report, covering October of 1946 to the end of 1947, reads:

> "The acceptance of research, with a minimum of planned and directed sales effort, has resulted in unbalance between governmental and industrial research; 69 per cent of the work during 1946 and 1947 was for governmental agencies and only 31 per cent for industrial sponsors. This unbalance arose because of the relative ease with which governmental research could be obtained.
>
> No more governmental research will, in general, be accepted unless the contracts provide for enough overhead to cover expenses, and then only when surplus space can be used and when industrial research is expected to stem from the governmental research. A governmental project may occasionally enable us to add to our staff people who are needed for other reasons, or may help pay for research that is planned for other purposes."[D]

Thus, the predilections were clear, but industry contracts, Western or otherwise, proved unable to meet the financial demands of the growing Institute. The same report noted that four of the most important Western industries—nonferrous metals, paper, food, and forest products—spent, respectively, 62¢, 39¢, 19¢, and 7¢ of every $100 of value-added from manufacturing on research. These staid industries obviously wouldn't offer much potential support, no matter how competent SRI became in those areas. Given that many companies also had their own small research groups and that information technology was yet to emerge, it is not surprising that the Institute had to seek government funding. SRI's growth needs came from attracting good people, and doing that meant acquiring up-to-date capital facilities and the buildings to house them. New, essentially free quarters were found in Menlo Park and were adequate, but good capital equipment would require appreciable discretionary income.

During these early years the University continued to formulate and enforce policies that influenced the kind of work that SRI conducted and, at least indirectly, the kind of people it hired. In early 1947, SRI's first director, William Talbot, hired Maurice Garbell as the Director of Aerophysics Research. Part of Talbot's instructions were that "no research activities should be undertaken between the Institute and any agency which will conflict with the interests and well being of the various university departments and that every effort will be made to cooperate with these departments." Talbot wanted closer and collaborative ties with University faculty and access to graduate students, but the University

[3] From SRI's second director, Jesse E. Hobson, comes this reflection: "You may remember that Dr. Tresidder (Stanford President) died suddenly in early 1948 after I agreed to go to Stanford but before I arrived. As I think now about the next two or three years it becomes more and more apparent that one man really made possible the development of Stanford Research Institute and that was Dr. Alvin C. Eurich, Acting President of Stanford University. He gave me and the Institute outstanding support and confidence in the face of rather strong skepticism, doubt and—in some cases—out right antagonism. We would never have survived through the fall of 1948 without his very strong support with the Board of Trustees of Stanford Research Institute. There were two months that Fall when I did not know until the last day of the month whether or not we could meet our payroll and I knew there were those who wanted to close the Institute, take the loss of four or five hundred thousand dollars and forget the whole affair." (Charles J. Maisel and Treva W. Jones, *A History of Stanford Research Institut*e, SRI internal publication, October 1962.)

[4] Appendix C lists the 1949 SRI Board.

proved unwilling.[5] In fact, within 6 months he and Garbell had violated Talbot's own stipulation by submitting a proposal to the Office of Naval Research (ONR).[E] Furthermore, in December of that same year SRI's Carsten Steffens told Tresidder that Talbot had said SRI would become a completely separate organization.[F] This and other such developments probably did not sit well with Stanford's president, for by early 1948 Talbot was gone, replaced by Jesse Hobson of the Armour Research Foundation in Chicago.[6]

Terman would assist in bringing Hobson, a fellow electrical engineer from Purdue, to SRI. Within a month, Hobson was followed by another Terman colleague who would also become very important to SRI: Tom Poulter, after whom SRI's Poulter Laboratory is named. Terman's links with the wartime Radio Research Laboratory (RRL), which he had led at Harvard, and with ONR would also bring strong talent to SRI. First, Ralph Krause and Tom Morrin, both from ONR, came as Director of Research and Director of Engineering, respectively. Shortly thereafter, a dozen or so former RRL engineers also came west to help create SRI's Engineering Division.[7] Like Terman, Hobson himself initially advocated a close interaction with the departments of the University. While some of that early interaction occurred in both the sciences and engineering, it neither amounted to much nor did it grow to a point of advocacy on either side.

Given this situation, operational autonomy from the University was inevitable. The University's oversight began to diminish as it and the Board gained confidence in Hobson. As the Institute gradually achieved profitability, it embarked on a growth path that soon gave the University pause in considering what it had created. Stanford conducted an organizational and financial audit in 1950 to gain a snapshot of SRI, including its reputation and its needs. That audit, initiated by the SRI Board, revealed that the Institute was indeed growing rapidly. It had achieved research revenue of nearly $2 million in 3 years, whereas comparable research organizations had taken from 2 to 10 times that long to do so. The audit also praised the quality of the SRI staff and its national prominence in three of its five major areas of work. The report also revealed the early existence of what would become a chronic problem at SRI, the quest for adequate capital equipment. The outlay in 1950 was about one-third the $5,000 per researcher that was then considered a minimum.[G]

Staffed with competent and creative research talent, SRI soon grew to be a vibrant and self-realizing organization. The Western industry-laden SRI Board came mainly to appoint the SRI president. With but few exceptions their benign but distant interests brought little work to the Institute. SRI's research practices became, and remained, the responsibility of its senior staff and first-and second-level managers.

In retrospect, these were heady days. SRI's uniqueness, at least in a Western setting, brought many important people to its doors and to the convocations it would hold. People like David Sarnoff [8] and Vannevar Bush would stop by or lend association. These episodes are well chronicled in Gibson's two books.[H]

SRI developed a culture defined by competent work and an uncommon freedom to pursue a broad diversity of problems important to both industry and government. For 20 years it grew in staff and revenues, but over much of its life it has had trouble creating enough discretionary money. SRI was, of course, an institute and not a company. Semantically, an institute normally exists in support of a cause

[5] Ernest Barbour O'Byrne's Ph.D. thesis, *The Research Institutes of Stanford University* (June 1951), quoted an interview with Talbot revealing that the reason was essentially a salary imbalance. Salaries were higher at SRI, which caused consternation among faculty members and their students. Many years later, I also became aware of Stanford faculty members' concerns about losing their good graduate students to SRI before they finished their Ph.D.s. Over the years students have been able to continue their thesis work once becoming SRI employees, as I did, but that was not a common practice.

[6] In the early days, SRI tried to steer a path between universities, with their basic research bent, and consulting or the very focused laboratories of commercial companies. In the *San Francisco Chronicle* of December 15, 1952, SRI director Dr. Jesse Hobson reiterated that position. He went on to say that a recent increase in projects stemming from the Korean War was "more government work than we'd like to do."

[7] Gillmor, op. cit., and the RRL *Phone Directory* of 1945. Interestingly, on SRI's first project for ONR, exploration of the natural rubber-producing potential of the guayule plant, ONR's contracting officer was Charles Hilly, who for years would head SRI's contracts group, and Wilson Harwood, who held budget approval authority at the Naval Research Laboratory, and who later joined SRI's Business Group, and opened SRI's work in Saudi Arabia (see Chapter 14).

[8] David Sarnoff, whose fabled RCA research laboratory would become part of SRI in 1987, in the feature address at an SRI Associates Program on November 14, 1951, extolled SRI as "an outstanding example of the natural partnership between research and industry."

whereas companies exist to earn a profit. In any case, SRI was, by both design and practice, a nonprofit organization.

Initially, SRI was housed on the Stanford campus. But within 8 months of its founding SRI moved into a part of the surplus Dibble Army Hospital in nearby Menlo Park. That facility had been built to handle some of the increased patient load on the Letterman military hospital in San Francisco that was anticipated as a result of the expected invasion of Japan. Opened in 1943, the hospital was used for a few years mainly as a place for dentistry, for difficult reconstructive surgeries, and for rehabilitating soldiers who had eye damage or had been blinded. More than 16,000 patients were treated there. But, with the war over, it was closed in early 1946 and declared surplus.[1] Today, more than a half-century later, many of its original, "temporary" buildings are still in use at SRI and by the City of Menlo Park. Once off campus and out of sight, so to speak, the Institute got its legs and grew, and the University exercised less and less influence over its offspring.

Thus, time and circumstances changed the relationship between SRI and Stanford. The distancing had grown so great that by the late 1950s the two had few joint facilities, projects, or clients. A relatively few staff members had joint appointments at the two institutions, but the University trustees were still SRI's ultimate governing body.

In the mid-1960s with the coming of the Viet Nam War, student unrest grew across the nation. That unrest was manifested at Stanford by demonstrations against the classified work that went on in some of the University's engineering laboratories and at SRI. Student demonstrations were held at SRI's Hanover Street location in Palo Alto adjacent to the University and at SRI's main offices in Menlo Park. Because the demonstrations precipitated a fundamental change in SRI's status, a bit more detail is warranted.

The Separation from Stanford

It is safe to say that the tenor of student unrest surrounding the Vietnam War derived from dissatisfaction with the policies and actions of both the U.S. government and the country's largest corporations. Some student factions at Stanford harbored the same opinions and targeted Department of Defense (DoD) work on campus, the industrial alignments of the University's trustees, and SRI for demonstrations. Student concerns began to be voiced as early as 1965 when it became known on campus that SRI had two government contracts concerning chemical warfare. Those concerns intensified in 1967 when they learned that SRI had also taken on contracts relevant to the war in Southeast Asia. In April of that year some students began picketing in front of SRI's Menlo Park campus, as well as at some of Stanford's engineering laboratories. Their protests soon crystallized into demands to end all war-related or classified work, specifically that involving the war in Southeast Asia. SRI's economic development work for developing countries also came under fire as being conducted only to further the self-interests of large corporate sponsors. Almost all of that work was, in fact, sponsored by foundations and international assistance groups.

The students' lack of specific knowledge about the balance of work under way in the engineering laboratories of both institutions and SRI's economic development work did little to temper their outlook. Any association with the DoD or big business seemed enough to levy harsh, sometimes accurate, but usually unfounded demands concerning both the work being conducted and the relationships that led to it. SRI's chemical warfare work, for instance, had been almost exclusively defensive in nature—seeking ways to cope with such a threat. SRI was also investigating counterinsurgency techniques needed for the Vietnam War. As a practical matter, the details or legitimacy of the work made no difference, and the campus and local press followed the students' activities in copious detail. By the end of 1968, the protesting students, along with not a few faculty members, sought SRI's separation from the University.

By early 1969, the demands of the students had become legitimized in University-sanctioned meetings, and Acting President Robert Glaser formed an ad hoc committee to review the association with SRI and to make recommendations. After 6 months of study, including substantial information that SRI provided the committee, the majority of the committee recommended terminating the association with SRI, asking for SRI to compensate the University for its loss of the

Institute. [9] During the committee's deliberations, however, the students, realizing that a separate SRI could proceed freely, had reversed their earlier position. A new facet of the protest, called the April 3rd Movement, was born. That orientation was also reflected in the committee's minority report, which was written by two faculty members who were sympathetic to the students' demands. Their position asked for closer University ties with SRI; a stipulation against military-related work, including counter-insurgency and other contracts related to the war in Southeast Asia; and the requirement for an SRI oversight committee.

Meanwhile, at SRI discussions were being held about the relationship with the University, research freedom, and self-determination.[10] Surveys reflected that the vast majority of the SRI staff had no stomach for others defining what constituted "moral" work and wanted independence. SRI President Charles Anderson and several of the SRI leaders expressed their clear indignation at the notion of a moral oversight by the University community in any form.[11] From the outset, SRI leadership had taken the position that work for a duly constituted U.S. government was, by definition, in the public interest and a legitimate and worthy endeavor. Many SRI leaders, particularly those on the management consulting side, agreed with the original student demand for separation, if not with their reasoning. Another crucial factor was that government contracting agents so disliked the growing uncertainty that they held up contracts SRI had already won. Given these conditions at SRI, the urgency the trustees felt about resolving the crisis soon, and the ad hoc committee's recommendations, separation became unavoidable. In effect, the thinness of the institutional relationship between Stanford and its research institute could not survive the clamor of the time as amplified on campus, the streets, and in the press. The trustees issued a statement on May 13, 1969, laying the groundwork for SRI's separation from the University.[12] Importantly, they put no restrictions on the kind of research SRI could undertake. But other terms of the agreement that would seriously affect SRI were still to come.

As with many divorces, freedom had its price for SRI. Most onerous was an agreement to pay the University from 0.5% to 1% of its *gross revenues in perpetuity*.[13] As a nonprofit

[9] Apparently, President Glaser conveyed to Hoot Gibson at the time that the relationship between the University and SRI had to change (Weldon Gibson, personal communication, June 1, 2000).

[10] As early as November 1968, Stanford Trustee and SRI Board Chairman Arbuckle appointed a subcommittee to study the SRI-Stanford relationship. Among the eight board members on that committee were Trustees Morris Doyle and Ed Littlefield. On the University side Arbuckle was also chairman of the trustees, and a bit later he set up a trustee subcommittee on the SRI question that consisted of Littlefield, Fred Merrill, Thomas Pike, and its chairman, Morris Doyle! Whether the deliberations of this overlapping assemblage retained much independence is doubtful but at least they should have been efficient. As it turned out, essentially all of these men came to a position of wanting to protect SRI as separation occurred; that is, up until the question of a financial settlement arose.

[11] According to a Stanford University press release dated April 30, 1969, President Anderson, in a presentation to a Trustee committee on SU-SRI relations, eloquently defended a widely held SRI opinion. He attacked the "arrogant suggestion that a small group that does not represent a majority viewpoint should rule on the moral acceptability of research" and he was "indignant, then incredulous" that such a review committee could be taken seriously by University people.

[12] According to Anderson, the trustees' quick action was prompted by contacts from SRI's Board. In an address to SRI associates in December 1969, Anderson also recalled how this decision by the trustees provoked consternation among those students who were seeking to control SRI as part of the Stanford family, and they rioted. SRI suffered some damage, and more than 100 students were arrested.

[13] The formula stipulated that SRI's payment would go from approximately 1% of *gross* to 0.5% after $25 million had been paid to the University. According to Dr. Gibson (personal communication, June 1, 2000) SRI Board member Edgar Kaiser suggested this draconian obligation as an acceptable middle ground that might avoid two potential lawsuits surrounding the high valuation of $21–45 million that the Scott Committee had placed on divestiture. One suit might have come from the University or its faculty if the valuation was lower than the Committee suggested, and one might have come from SRI or its staff who might have found the expected fee so high that it jeopardized SRI's ability to exist. In August 1969, at least one member of the SRI Board, Paul Davies, thought that if Stanford was paid anything, it ought to be small. But in December 1969 a memo from the SRI Board to the trustees was drafted and approved. It suggested granting Stanford $25 million provided SRI's name and charter purposes remain unchanged. That memo was passed unanimously by the SRI Board with members Doyle, Fuller, Pike, and Guggenheim, all trustees, abstaining. In an expression of the closeness of these negotiating parties, the memo was then submitted by President Anderson to Morris Doyle as chairman of the trustee subcommittee on separation! Clearly, the University trustees, as general members of SRI, could effectively control the SRI Board. Thus, one could view this situation as a built-in conflict of interest or an opportunity for the quick resolution of a family dispute. The settlement, while onerous for SRI, took on the aura of the latter. (Curiously, contradicting the above Board Minutes and stated dates of tenure, Trustee Ed Littlefield asserts in a letter to Paul Cook on December 5, 1994 that the two boards had no common members at the time.) A memo from the SRI Board to SRI chemist Felix Smith in January 1970 concerning his complaint about conflicts of interest,

corporation with a large portion of revenues from U.S. government grants and contracts with strongly regulated fees, this seemingly small alimony became a substantial and continuous drain on SRI's discretionary resources. By 1989, SRI had given more than $25 million to the University in accordance with the separation agreement. In spite of provisions in the agreement for no payment when SRI's financial health was at stake, some of these annual payments amounted to more than SRI's net profit for the year.[J, 14] Other stipulations had to do with abandoning the use of the Stanford name after 1974 in the Institute's title and continuing to honor those purposes in the SRI charter relating to the University, including reversion of SRI assets to Stanford if SRI were dissolved. These financial terms meant that the modest loan from Stanford at SRI's creation has returned an enormous value to the University.[15] Thus, through this separation, Stanford Research Institute became independent on March 31, 1970.

One of the terms of the agreement was that SRI could continue to use the Stanford name for 7 years.[16] During that time, the transition had little effect in SRI's marketplace, but eventually SRI had to establish a new identity with many clients. Of all the stipulations, however, the "alimony" payment to Stanford was the most burdensome. Otherwise, SRI continued its tradition of independent research and development and was no longer subject to University stipulations about the practice of management consulting.

Thus SRI became and remains a nonprofit, independent contract research institute. It has no endowment and therefore exists through the initiative and creativity of its staff. Its contracts are with many levels of government and industry, worldwide. It has had offices at one time or another in about a dozen countries. It is a place of uncommon intellectual freedom and it relishes its objectivity and competence.

The 1970s at SRI

While the separation from Stanford raised some turmoil for a time, it had no measurable impact on the ensuing 1970s. Over that decade, SRI's rate of revenue growth averaged around 10%. Each year a new revenue record would be set, but, as indicated by a relatively stable staff size of around 3,000, much of those gains were inflation-driven. Just as important as this consistency, however, was the realignment of some of the sectors from which the revenue flowed. Under Anderson, two trends were evident: one was a steady increase in the fraction of revenue from the U.S. civil, or non-DoD, sector. The other was an increase in international business. Both were important diversification factors. In 1970, SRI opened its first overseas research division in London and called it SRI-Europe. Over the next 15 years or so SRI would continue to build on its worldwide

states that because trustees didn't participate in the drafting of the settlement proposals, there was no conflict!

One case could have been made for SRI not paying Stanford anything since its original investment had been repaid with interest. Because Stanford had created a *nonprofit* corporation, its value, in the opinion of some, lay in public trust, at least until dissolution. Although Paul Jorgensen, former SRI Senior Vice President, said he raised this issue as a SRI Board member, it was never pursued. Perhaps because SRI's charter stipulates that upon dissolution, the assets of SRI pass to the University (another nonprofit entity), Stanford's counsel at the time, Warren Christopher, believed that the removal of trustees as SRI general members was grounds for substantial payment to the University. Though one option at the time was to dissolve SRI, it had no favor among the trustees.

[14] A February 1979 memo from Stanford's William Massey to SRI's Harvey Dixon indicates that while Stanford was willing to grant SRI a loan, it would not change the agreement. So this requirement continued until 1990 when SRI President Miller negotiated some exceptions to the 1970 payment agreement when SRI's financial stability might be threatened. The agreement was revisited in 1997 with further stipulations. These negotiated changes invoked promissory notes in lieu of payments during some years and outright relief in others. As of this writing in 2004, SRI is again paying the approximately one-half percent obligation defined in the 1970 agreement.

[15] According to the *San Francisco Chronicle* December 15, 1952, the Stanford trustees had advanced SRI $625,000, with six San Francisco banks providing another $600,000. Both were being repaid at the time of the article. A letter between SRI Board members, from Paul Davies to Stephen Bechtel on August 25, 1969, indicated SRI had paid off the Stanford "loan." Moreover, in a presentation to University Trustees on April 30, 1969, SRI President Anderson stated that SRI had not only repaid the $625,000 loan, with interest, but had also *voluntarily* given the University an accumulation in excess of $800,000, some of which came from times when SRI was but marginally profitable.

[16] The original separation agreement stipulated that SRI would refrain from using "Stanford" in its name following the agreement's fifth anniversary, March 31, 1975. The stipulation was amended in January 1975 to add another 2 years. The SRI internal phone book of March 1977 for the first time contains only "SRI" with "SRI International" appearing there the following September. SRI changed its Articles of Incorporation to reflect the name change in April 1980.

reputation in the areas of business consulting and economic development.

Overall, SRI staff continued winning new contracts. In 1972, it submitted more than 2,000 proposals of all kinds. By 1974, SRI had over 2,000 clients in more than 40 countries and, over the course of 1977, saw some 2,200 projects under way. The decade's business vitality continued well into the 1980s. But as exciting as the endeavor was to its research participants, SRI's long-term financial picture continued to be uncertain due to uneven and difficult-to-predict profitability.

The 1980s and a New Emphasis

For most of its existence SRI has struggled to be adequately profitable, and as the 1980s opened this trend continued.[17] Inflation-adjusted revenues were flat, and government-limited fee structure constrained gross income. Within the business of contract research perhaps the largest influence on income is the fraction of the research staff that is billing time to project. Specifically, the financial swing between billing research labor to overhead and charging it to a client project is huge. Though other overhead costs must also be controlled, managing that one parameter is critical if not easy. Though the sheer number of research staff vying for projects at any one time would seem to even out the revenue stream, the vagaries of the varied markets they visit imposed an unpredictability to financial operations including income. This difficulty has haunted most top-level managers at SRI. Was there a way to help reduce the financial impact of that uncertainty?

Arriving in 1979, SRI's new president, William Miller, decided to look into another form of income, one that would be tied to SRI's ongoing creation of intellectual property. Over its history, SRI had done a small amount of licensing but it had mainly used its intellectual property to win new projects. Serious attention to commercialization meant not only altering that earlier tendency but also taking a more aggressive stance toward retaining those properties in the first place, rather than always assuming they belonged to the client.

Miller had been Stanford's provost but perhaps more significant for this discussion, he was a co-founder of the highly regarded Mayfield Fund, one of Silicon Valley's important venture capital firms.[K] In July 1980, about a year after his arrival at SRI, Miller convened a small task force under Don Fiske, vice president of the Management and Economics Group, to look into establishing a for-profit SRI subsidiary to engage in commercialization. Their work culminated in a recommendation to form the wholly owned SRI Development Company (DEVCO), which would serve to separate SRI's contract research from its new ventures into the commercialization of its intellectual properties. Miller's next action led to an important decade-long relationship in how SRI would handle its intellectual properties.

In April 1982, SRI entered into a three-way agreement with DEVCO and a new venture capital firm, CommTech International. CommTech was to be managed by a general partner, but SRI as a limited partner was to receive one-third of CommTech profits. CommTech was also to pay SRI a percentage of the license fees and royalties it received from directly licensed SRI technologies and 50% of the up-front licensing fees of any limited R&D partnerships. The intention, of course, was to realize value by facilitating the flow of SRI technology to the commercial marketplace. CommTech was to court institutional investors for partnership funding and use that money to form limited partnerships, start new companies, or fund SRI to develop a technology further. In return the arrangement was exclusive, with CommTech having first right of refusal for all SRI-owned technologies for 7 years.

To promote this new type of business internally, in 1981 Miller dusted off SRI's staff royalty-sharing policy and tuned it to give 25% of initial royalties to the inventor(s), with a decreasing scale according to the total royalties received. This was a generous arrangement, and I remember my pet reaction was that it would help retain some staff members by "scratching their entrepreneurial itch" (an itch that was becoming one of Silicon Valley's worst allergies). Though the practice had the potential to create internal schisms between those whose work naturally led to commercialization and those whose work didn't, it was necessary to the new income strategy. In late 1982, Miller also established a Technology Commercialization Office to work with CommTech in seeking SRI

[17] Note that research institutions are not necessarily created to make money. Like all organizations, however, they must have enough discretionary resources to adapt and secure their future position (see Appendix D for a plot of revenue).

innovations and realizing their commercial potential. SRI was then poised, it seemed, to gain income from its commercially relevant work. Though with this process Miller raised some commercialization awareness around SRI, he didn't see it as displacing SRI's core business of research. Importantly, he saw its contribution as being not more than about 5% of revenues.[L]

One example of the new awareness was a review of the artificial intelligence (AI) field. About this time AI was becoming highly touted, with forecasted annual markets of $5 to $10 billion. SRI was a premier player in AI research and so everything fit.[M] But in part because AI was a difficult to implement technology and still emerging, nothing came of the initiative. On the other hand and about that time, some SRI AI specialists left to seek their own fortunes with no participation by SRI.[18] SRI made no attempts at AI commercialization and though a lot of other companies did, the market for AI did not materialize.

As this change was taking place at SRI, forces were at work in the U.S. Congress that would support SRI's commercialization initiative. In 1984 it passed the Bayh-Dole Act. This legislation granted to nonprofits the rights to commercialize intellectual property they had developed under government grants or contracts. This act served to remove the ambiguity of ownership of the results of SRI's government projects with that potential. Now SRI could get paid to explore a technology of interest to the U.S. government and then capitalize on its commercialization as long as doing it involved domestic rather than foreign partnerships. This seemed tailor-made for SRI and its work for agencies like NIH, NSF, and the research arms of the DoD. This entitlement has been exploited many times since and is still an important component of SRI commercialization strategy.

GE's Gift of the RCA Laboratories and a Continuing Focus on Commercialization

In late 1985, Jack Welch, the chairman of GE, purchased RCA. As in all acquisitions, consolidation became an issue: both GE and RCA had large, reputable corporate research laboratories, and the technical overlap between them was considerable. The RCA laboratory in Princeton was some 200 miles from the GE laboratory in Schenectady; that distance was too far, in GE's opinion, to consolidate even non-overlapping parts. Wondering how to proceed, GE hired SRI to help assess the overlap and indicate possible directions to take. At Princeton, the leadership and staff took an active interest in the proceedings, and one of the alternatives discussed was becoming a stand-alone contract research entity. The director, James Tietjen, mentioned various options, including that of independence, to GE management. Roland Schmitt, then head of the GE Laboratory, didn't think that option would work, but explored it anyway with a National Science Foundation Board acquaintance, SRI president William Miller. It undoubtedly didn't take long for the business-savvy Miller to see the opportunity.

During the course of SRI's review, one option that had already arisen was for GE to give the laboratory to a nonprofit corporation and enjoy the resulting tax benefit. Of course, SRI itself was such a corporation, and Miller was anxious to open another SRI-associated facility on the East Coast. As it turned out, Welch became interested in the idea, as long as he could believe the laboratory could make a successful transition. Both Tietjen and Miller got to make their cases in person to Welch, although separately.[19] Welch believed the odds were good enough, and Miller happily agreed to receive the laboratory. Thus, in April 1987, the RCA laboratory became the David Sarnoff Research Center, a wholly owned subsidiary of SRI. As part of the transfer and to help make it possible for the new Center to make its transition to self-sufficiency, GE guaranteed $250 million in research funding over the new Center's first 5 years.[N]

[18] Peter Hart and Richard Duda left to form Syntelligence in 1980, Earl Sacerdoti became a vice president of Teknowledge in the same year, and Gary Hendrix helped form Symantec in 1983. To the extent that any of these companies ultimately succeeded, it was not with products dependent on AI technology.

[19] Welch, on the occasion of Sarnoff's tenth anniversary, spoke of Miller as the "true hero" of the transformation "turning a tranquil enclave of technology into a P&L center."

But, moving from a somewhat protected position in a large corporation to self-sufficiency in an open contract research marketplace took a toll. To control overhead costs, Sarnoff had to release about one-fourth of its staff. Because of an attractive early-retirement package that GE offered, this reduction was made in a very humane way. But to help Sarnoff get its legs, Tietjen and Miller agreed to let the Center maintain some distance from its new owner in Menlo Park, at least as far as revenue generation was concerned. The skills of the two organizations were dissimilar enough that competition at the outset did not seem to be a problem. With GE's pledged assistance, a pledge transferred to Thomson CSF of France when it bought GE's television business at the end of 1987, Sarnoff successfully made the transition to contract research. Its people had acquired the skills to market its research to both the U.S. government and to industry, worldwide.

Sarnoff's tradition of innovation thus continued. But in addition to contract research, it also sought to create new companies, to bring new technologies to the marketplace, and to benefit from equity creation—and did so with much greater emphasis than its parent, SRI. But that increase in emphasis would eventually arrive in Menlo Park. Through its selection of subsequent SRI presidents, SRI's Board made it clear that this direction, and equity generation in particular, was to frame the future Institute and help solve the ongoing problem of marginal profits.

At SRI proper the commercialization of its retained innovations continued to receive noticeable attention but with mixed results. The exclusive CommTech arrangement was not creating either the licensing or equity values that were hoped for. Yet in the later part of the 1980s the entrepreneurial atmosphere continued to grow in Silicon Valley, and it found its way inside SRI. To follow up on an example cited earlier, the sanctioned AI exploration had yielded no licensing or equity initiatives but there was still an interesting footnote. In about 1988 two members of the AI center left to form a software company. While producing none of the exciting AI advancements that had been explored, the new company nevertheless became successful and by the early 1990s returned, through gifting, several million dollars to SRI.[20] This exploration into AI says something about the difficulty in searching for and selecting commercial winners. The attractive options may lie in the shadows formed by the glare of those that are more technically advanced. But to stay the course, one of Miller's final actions before leaving SRI in 1989 was to extend the unpopular CommTech agreement for another three years!

The Decline of SRI's Business Group

Another thread in SRI's evolution that was facing important challenges about this time was economic and business development—performed in what we have called here the Business Group[21]—which had been a significant part of SRI from its very beginning. For perhaps three decades, from the mid-1950s to the mid-1980s, this part of SRI had grown to attain worldwide stature. SRI became known for assisting both developing countries and corporations around the world manage the changes and challenges they faced. But across the 1980s the Business Group began to suffer financially; that is, it was requiring subsidy from the rest of SRI. The reasons for this decline are unquestionably many and subject to individual interpretation, but I briefly examine a few here.

The work done in the Business Group was quite different, actually complementary to that in the rest of SRI. Over the years the Business Group hosted the overwhelming share of the Institute's work from the commercial sector. While the remainder of SRI had some commercial leavening in its dominantly government work, a portion of that came from labor loaned to Business Group projects. Thus, though the Institute as a whole appeared to be diversified across a set of uncorrelated research markets, internally the separate groups were considerably much less diverse. The diversity within the Business Group was exemplified by economic development work for governmental

[20] More detail on this company and aspects of the CommTech arrangement can be found in Appendix D.

[21] To be clear, this refers to the practice of economic and business development and consulting centered in Menlo Park and does not include a vital and continuing practice of these areas centered in Washington, D.C. That latter activity has always been part of what is referred to in this book as the Education and Policy Group.

jurisdictions and business development for corporations.

From SRI's beginnings to the early 1990s, the Business Group had a continuing stream of large noncommercial projects, mostly international economic development work for foreign governments, foundations, and international aid agencies. Given the longer duration of these projects, they provided a flywheel effect for contract revenues and income. The smaller, problem-solving projects that the Group was getting from the commercial sector tended to be expensive to win and to execute. In the early 1980s, the Group's leadership separated the economic development and business consulting organizationally. While not intended to decrease Business Group diversification, the reorganization did serve to illuminate each of the components more clearly.

But both sectors of the Business Group's work began to decline into the 1990s. Competition in business and management consulting was growing rapidly. In addition to direct competitors like Arthur D. Little, the large accounting firms were entering management consulting. With their insights into company problems, they had greater access to CEOs in areas such as long-term planning and strategic guidance. While SRI had earlier provided the foundation in areas like strategic planning and innovative business practices, these same CEOs were now prone to thinking of SRI as a technology-oriented problem solver. Even the leaders of Japan's Osaka Gas, with which SRI had had a long-term close relationship, did not turn to SRI when the company wanted to reorganize in the 1990s.[O] Being relegated to technoeconomic work was a continued frustration for many of the Business Group leaders who sought the more profitable long-term support relationships that the major accounting firms were securing. I remember Management Council meetings where Business Group leaders indicated that they were discouraged by client surveys that pigeon-holed the Group as only technology consultants.

There was another view on that topic, however. According to one set of Business Group executives, the decline in SRI's business-consulting sector dated from when principals inside the Group began a voluntary withdrawal from collaboration with the technical side of the house.[P] That reservoir of technical talent was believed by many to be a valuable differentiator in the marketplace of business consulting. In any case and for whatever reasons, the Group's financial health continued to suffer.

One of the ongoing successful parts of the Business Group stemmed from its early innovations in strategic planning *methods* and the services that ensued. SRI had made rich contributions to both the information needed for planning and to the planning methods and tools that could help corporations and other organizations confront their futures. By the 1990s this was called the Business Intelligence Program (BIP) and it continued using these tools in particular scenario planning and market segmentation techniques.

Another notable facet of the Business Group was the corporate gatherings it would organize. Worldwide conferences such as the quadrennial International Industrial Conference that continued for 40 years and new associations across the Pacific Basin were evidence of SRI's stature. But as purse strings tightened, these activities, somehow affordable in the Group's heyday, were now looked at with a more frugal eye. Because such convocations had not been profitable in and of themselves, SRI decided to discontinue them. As a result of these factors and more, the Business Group had become marginalized by the early 1990s, and rather than try to reinvigorate it, a different operating model would be imposed.

The Arrival of a New and Active Chairman

In 1993 Paul Cook was named the new chairman of the SRI Board. He would become its most active chairman since the Institute's earliest days. In January 1994, Cook brought in a new president, William Sommers, whose major experience was in management consulting at Booz Allen Hamilton. Because of that background he soon saw that SRI's business development or consulting side was operating under what he viewed as an inappropriate cost-plus-fixed-fee contract system. This system, driven by government auditing regulations applicable to the technical and educational parts of SRI, made profit sharing, a conventional management compensation approach in the consulting world, impossible. Though some thought had been given to demand-based pricing under

President Miller, most contracts remained fixed-fee.

Sommers was correct in viewing these SRI practices as seriously inconsistent with *his* particular perspective on management consulting. If the Business Group were to conform to *his* notions, something had to be done. Whether his was the operational model the Business Group should follow, whether the world of the large business consulting firms was the right marketplace for SRI, and whether the existing staff, who were vital to the transition, believed in that approach, did not appear to carry much weight. What was clear, however, was that his compensation system could not happen inside of SRI proper.

Thus, adopting the compensation and market template of more conventional management-consulting firms, Sommers moved in 1995 to convert the business side of the Institute into a for-profit subsidiary. SRI's business-oriented Board approved. The new entity was called SRI Consulting (SRIC) and its managers were to be given a more lucrative, incentive-based compensation with additional guarantees and perquisites totally alien to SRI. SRIC was formed around so-called "rain-makers," who were to create the high-valued relationships with those corporate clients that could afford to pay the higher prices that such compensation systems required. This orientation ran counter to SRI's traditional culture, which from the beginning had been more academic and much more egalitarian. While escaping from that past was a specific objective, the majority of existing staff, who were not so oriented, found themselves in an uncomfortable world. Regrettably, while the new company was free of SRI, SRI was not free of it, and the SRIC conversion would turn out to be very costly to SRI.

To implement the changeover, Sommers brought in leadership unfamiliar with the abilities and market orientation of the former SRI staff. Within about 4 years SRIC had eaten up its inherited backlog, failed to win any new long-term clients, and required financial bailouts that were huge for SRI.[22] Nor did any of the "rain-makers" pan out. In spite of hiring about 30 allegedly worthy of that moniker, they proved unable to land substantive new projects. In the meantime, many of those more traditional project developers that had transferred were leaving.

In the end, with but two exceptions, the Menlo Park part of the Institute was out of the economic development and business consulting fields. These were the venerable multi-client programs known as the Business Intelligence Program, begun at SRI in 1959, and the Chemical Economics Handbook that began in 1950. For a few years they remained the only meaningful operational part of SRIC and today both have left.[23] As noted earlier, important economic development work successfully continues in SRI's Washington, D.C. office.

Continuing Refinement of a Strategy for Intellectual Property

For most of SRI's history, its Board members had chosen to have a rather benign influence: reviewing compensation policy, watching the income and capital investment numbers, and choosing the SRI president. But with the arrival of Cook came his resolve to make the Institute a stable and profitable place. Besides the need to deal with the slipping Business Group his other, more passionate orientation was equity generation or start-ups. While temporarily acting as SRI's president, he brought his ideas in this regard to the Institute leadership groups.

As some of us in the Engineering leadership first listened to Cook's message of reform, there arose doubt about the permanency of some areas of traditional research; namely, those that had no commercial relevance. We wondered whether the unwritten but long-held tenet that any well-funded research area had implicit protection would hold up. Cook's emphasis was clear. First, he would remove any ambiguity about how much the Institute would be engaged in intellectual property commercialization. Second, he would closely watch the research areas or labs that had chronic profitability problems. He was a very successful veteran of the company-building world and seemed intent on playing that out at SRI. He cast the impression that research

[22] A good estimate is about $42 million.

[23] In 2001, BIP became an affiliated company, SRI Consulting-Business Intelligence, through a management buyout by its staff. In January 2004, the Chemical Economics Handbook and its related issues were sold to Access Intelligence, an information services company in Potomac, MD.

should, where possible, be tailored so as to ultimately create the value inherent in licensing and equity building.

It did not hurt that in the late 1990s the Silicon Valley model of equity generation was approaching manic proportions. As copious amounts of money flowed into start-ups, the surrounding area was becoming even more expensive to live in, and competition for staff was becoming critical. Simply put, Cook wanted SRI to *use* the Silicon Valley model rather than be victimized by it. To help cure SRI's financial woes, he wanted to incubate new, high-value companies, with their lucrative initial-issue equities accruing both to the Institute and to select people within it. It appeared as though he believed this course could build an endowment that would not only stabilize the Institute financially but eventually give SRI the freedom to pursue research of its own choosing.[24]

On Sommers' departure in December of 1998, Curt Carlson, who was in charge of commercial licensing and company formation at Sarnoff, became president. Given his previous job, his incoming strategy also centered on using SRI's intellectual property output to build not just a large research endowment but even to create a more attractive campus, free of the WWII buildings still in use. Those noble goals seemed possible. After all, the IPO wealth-generating machine was well-oiled and still purring all around the region. Rather than letting commercialization be a shared effort by existing staff, SRI hired mostly new people to intensify the process. Doing so, of course, required investments that would come from either the Institute's overhead for from the already marginal bottom line money. The impetus for commercialization was thus invigorated, but, for reasons elaborated on in Appendix D, there would come constraints on that kind of enterprise that are inherent to a contract research organization.

As important as anything internal, however, came something from the outside. Any inherent difficulty in commercialization, including an inordinate commitment of funds toward it, would find a sobering confirmation in the burst of the dot-com bubble in 2001. The almost immediate decrease in the availability of venture funds made the SRI initiative much more difficult to carry out.

Though still an important part of the SRI operational strategy, commercialization has been scaled back a bit and the core contract research business is again front and center. Unlike the early days at SRI, however, the commercially promising output of the research process will be carefully and continuously examined for value. Seeing how those two facets of operations fit sensibly together in a creative research environment and in the entrepreneurial environment of Silicon Valley will also continue to be examined. For the moment the SRI ship is upright and under sail. Under President Carlson's leadership SRI is again profitable, growing, and projecting vitality in its ongoing research.

[24] A bit more detail of the movement toward commercialization and its ramifications inside SRI can be found in Appendix D covering the SRI business model.

Endnotes

[A] Weldon B. Gibson, *SRI–The Founding Years* and *SRI–The Take-Off Years*, William Kaufman, 1980 and 1986, respectively. Hoot passed away in the late spring of 2001.

[B] This account of Heald's influence has been taken from an issue of the *SRI Journal* (Feature Issue 4, December 1966) on the occasion of SRI's twentieth anniversary.

[C] Maurice Holland, *Survey of the Stanford Research Institute*, report to SRI's Board, August 17, 1950.

[D] *First Annual Report of the Stanford Research Institute to the Board of Directors*, October 1946 to December 31, 1947.

[E] Stewart Gillmor, *Fred Terman at Stanford: Building a Discipline, a University, and Silicon Valley*, Stanford University Press, October 2004.

[F] Gillmor, op. cit.

[G] Maurice Holland, op. cit.

[H] Gibson, op. cit.

[I] *The Dibble General Hospital – A History*, published by Sunset Press, San Francisco, for the Hospital, May 8, 1946 (courtesy of SRI's Bruce Clark), and Michael Sranevik and Shirley Burgett, *Menlo Park California – Beyond the Gate*, Menlo Park Historical Association, Custom and Limited Editions, 2000.

[J] Letter of March 23, 1993, from SRI Treasurer, Don Andrews, to Stanford's CFO, Peter Van Etten.

[K] *SRI Journal*, Vol. 5, No. 2, April 1985.

[L] Ibid.

[M] SRI AI Task Force, *An Assessment of AI Technology Commercialization – Market Overview and Opportunities for SRI*, December 1984.

[N] A good encapsulation of the transition can be found in Miller's testimony to Congress (House Committee on Science, Space, and Technology) on July 13, 1989. A more complete story of the episode can be found in a local newspaper, the *Business for Central New Jersey*, April 2, 1990.

[O] Paul Jorgensen, personal communication, July 9, 2001. For many years Jorgensen was the SRI executive who worked most closely with Osaka Gas.

[P] William Bloom, Ken Colmen, and Doug McConnell, personal communication (in a joint conversation), June 28, 2001.