

Foreword to *Fred Terman at Stanford*

“Father of Silicon Valley,” the words seem to leap from the page.

Invariably this is the only description now applied to Fred Terman in newspaper and magazine articles. It is not an inaccurate title, but it hardly begins to do justice to the genius that was Frederick Emmons Terman. It is difficult to know where to begin when describing him. He was without a doubt a brilliant electrical engineer, a learned scholar who authored groundbreaking textbooks on radio engineering and electronics, an inspiring teacher who kindled the spirit of discovery in his students, and an academic administrator whose devotion to excellence and visionary leadership firmly set a university on the path toward greatness. It was the latter, coupled with the extraordinary depth of his vision that I find the most compelling and enduring of Fred’s many accomplishments. When all is said and done, one cannot separate Fred Terman from Stanford University, for their stories are inextricably intertwined.

Fred Terman set a standard of excellence for the Stanford campus that has endured to this day. He was a driving force in the development of policy, and his vision for Stanford and the surrounding community is the envy of universities throughout the world. He ranks among the finest academic administrators in the history of American higher education. His theories on the development of a modern research university and his implementation of those theories have stood the test of time. I would strongly encourage any 21st century administrator interested in

developing a campus and its curriculum to study closely Fred Terman's work at Stanford.

It seems strange that a man who would alter the course of a university would spend the better part of his life in one place, only occasionally venturing away from that university and from academic life. Fred Terman grew up at Stanford and his entire career, except for the war years, was essentially spent at the University. His devotion to Stanford was total and his love for that institution led him to work ceaselessly on its behalf. He and Stanford's legendary president, Wallace Sterling, took what was considered a respected university and transformed it into one of the truly great universities in the world.

That transformation seems to have had its beginning during Fred Terman's tenure in the Department of Electrical Engineering. As the department grew in stature, so did Fred as an academic administrator. He recruited the most talented students in the field. He encouraged those students to stay in the area, as he himself had done, and to use their knowledge to create what we now refer to as start-up companies. From there it was a natural progression for him to develop close ties with local industries begun by his students. I have always felt that the cross-fertilization between academic and industrial research, encouraged by Terman over half a century ago, is one reason why university scientific discoveries are so rapidly translated into new industries, companies, products, and services. It is also one of the reasons the United States generates new companies, new jobs,

new products and services at a much faster pace than the rest of the world.

But, once again, the creation of the Silicon Valley is only a portion of Fred Terman's work that is worthy of examination. As an academic, he not only recognized the necessity of providing a broad curriculum for engineering students, but he was also, as Stewart Gillmor points out, "especially interested in the multifaceted interdepartmental approaches to academic planning and research." (Page 818). For instance, under Provost Terman, although I was a professor of psychology, I also held appointments in the School of Engineering, School of Education, Applied Mathematics and Statistics Laboratories, and Institute for Mathematical Studies in the Social Sciences. Terman understood the value to students and faculty of cross-disciplinary work and he encouraged its development to the greatest extent possible.

Terman knew that for Stanford to mature, it would have to focus on what it could do best--what he commonly referred to as "steeples of excellence." He had a tremendous sense of quality and he encouraged the establishment of departments and growth in areas where Stanford could be truly superlative--engineering, physics, chemistry, mathematics, and computer science to name but a few. Mediocrity was not in Terman's vocabulary and he constantly strove for excellence in every aspect of his own life and in the life of Stanford and its students. He was extremely adept at acquiring government funding to support activities that had the potential to attract faculty of the highest order. Although controversial, his

solicitation and use of government money served to, as Gillmor points out, “dramatically improve Stanford’s financial base,” (page 823) thus making it possible to recruit some of the finest faculty in the country. By the end of Terman’s career, Stanford had become an institution of higher education known throughout the world for adhering to the highest standards of excellence and to which academics clamored to gain appointment.

If there is a model for me in academic life, it is Fred Terman. I was a member of the Stanford faculty for almost 25 years. During much of that time, Fred was provost of the campus, working closely with President Sterling on the vitalization of the institution. We were brought together by Albert Bowker, who was one of Fred’s closest associates and an exceptional academic administrator in his own right; he would later become chancellor of the University of California, Berkeley. I was able to apply the knowledge I gained from Fred’s work at Stanford years later when I became chancellor of the University of California, San Diego (UCSD). I sought to use the “Terman Model” as roadmap for UCSD’s partnerships with the telecommunications and biotechnology industries that were beginning to spring up in the region, and encouraged the development of UCSD’s own peaks of excellence. We were successful in San Diego, and I owe a debt of gratitude to Fred Terman for providing me with a perspective on the evolving role of the research university.

Fred Terman was a brilliant, complex, and unassuming man. He never

sought recognition, but preferred to remain in the background, to bask in the reflected glow of Stanford's new found glory. When I think of Fred, I am often reminded of a quote from the Chinese philosopher Lao-tzu,

*Therefore the sage holds in his embrace the one thing (of humility), and manifests it to all the world. He is free from self-display, and therefore he shines; from self-assertion, and therefore he is distinguished; from self-boasting, and therefore his merit is acknowledged; from self-complacency, and therefore he acquires superiority. It is because he is thus free from striving that therefore no one in the world is able to strive with him.*¹

The time has come for an in-depth examination of the remarkable growth and development of Stanford University and the role Fred Terman played in its post-World War II transformation. I am pleased that Stewart Gillmor is giving the world an opportunity to know Fred Terman not simply as the creative force behind the development of Silicon Valley, but also as a superlative engineer and researcher and as an academic administrator of uncommon vision.

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¹Lao Tzu, Tao Te Ching, trans. James Legge (Oxford: Oxford University Press, 1891; Mineola, New York: Dover Publications, 1997), p. 19