The recent death of Dr. H.S. Tsien on October 31, 2009 has been reported internationally in both scientific journals and news reports, including a lengthy obituary [1]. Dr. Tsien’s accomplishments and fame have been well documented. In this letter, I hope to convey some personal observations of Dr. Tsien as a researcher and teacher.

Before and during his tenure at MIT, Dr. Tsien’s seminal work in fluid mechanics and jet propulsion were well known, as was his collaboration with Theodore von Karman, probably the best-known aeronautical engineer and scientist of his time as well as the founder of the Aeronautics program at Caltech. In the late 1940s Dr. Tsien came to Caltech and became the head of the Daniel and Florence Guggenheim Jet Propulsion Center. Several of us, all first-year graduate students, took a course from him in rocket propulsion; this was a new and exciting field for everyone involved.

In addition to Dr. Tsien, the faculty members of the Jet Propulsion Center were Prof. Frank Marble, Prof. Duncan Rannie, and Prof. Sol Penner. In 1950, six Guggenheim Fellowships were awarded; three at Princeton University and three at Caltech; I was fortunate to be one of the recipients at Caltech. We were in awe when Dr. von Karman returned to Caltech to visit Dr. Tsien and the other faculty of the Jet Propulsion Center, where Dr. von Karman met with us and our advisors to discuss our research work.

With appreciation of Dr. Tsien’s fame and the respect held for him, it is easy to understand the great interest generated when he announced a new course in what he called engineering cybernetics, “a new branch of engineering science.” This was possibly one of the first courses in control theory in the United States.

The classroom was filled with 25–30 people, faculty and graduate students alike. Dr. Tsien was an extremely effective instructor. His boards were concise and beautifully done, and his slightly accented lectures were carefully thought-out to explain key points. The course was a great success. In a discussion with students, he once noted humorously that to become known in a field, it helped to add to the jargon; thus was born the Satche diagram, a modest extension of the Nyquist diagram [2].

At the end of the term Dr. Tsien asked how many were taking the course for credit. Only four of us raised our hands. He then suggested that competition in a final with only four participants seemed pointless and asked if we would rather work with him on a little research problem. I was in awe when Dr. von Karman returned to Caltech to visit Dr. Tsien and the other faculty of the Jet Propulsion Center, where Dr. von Karman met with us and our advisors to discuss our research work.

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Having experienced Dr. Tsien’s exams before, we all jumped at the suggestion! As it turned out, we worked very hard for about three weeks on a control problem using perturbation theory to handle linear systems with variable coefficients. Then each of us was given an oral exam by Dr. Tsien; finally, we helped write a paper covering the work. It was well worth the effort since the paper was published in the Journal of the American Rocket Society [3] and constitutes Chapter 13 in his book [4].

The paper [3] led to interesting complications. Since our results for range corrections differed somewhat from those made at the Jet Propulsion (JPL) Laboratory for the Corporal missile, a discussion of the difference was in order. However, at this time Dr. Tsien was having a security problem with the U.S. government because of charges made against him when he and his family were going to visit the People’s Republic of China. According to what was told then, one of the points was the ridiculous charge that he was taking with him secret materials hidden in his log tables. Because he could not have any connection with the Corporal missile, I was asked to speak with the people at JPL. In all of this, Dr. Tsien was extremely careful not to involve any of his students with his problems.

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and there was a great fear that somebody would come along, like George Axelby, who would take control of the journal. And I don’t know what they were worried about. George controls Automatica, a very fine journal. Edited journals of which I am aware of that are controlled by individuals are often very good. If they are not good, it is not because they are controlled by an individual but often because they are controlled by the wrong individual.

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When we have had these discussions before about the Transactions (the last I remember was in the late 1970s), we did not have any other publication vehicle. Now we do. My solution to this problem is to put more money into the IEEE Control Systems Magazine (CSM). CSM can publish first-class articles. Consider IEEE Computer magazine. Is that a second-rate journal? Not at all. It is different than the Transactions, but, certainly, it’s a very useful vehicle for publishing results in computing. It may lack theorems and certain kinds of research results, but, certainly, it is a good vehicle. We now have that vehicle, and for my money, I would rather see the CSM budget doubled or tripled, rather than trying to interfere with something that, I think, is doing very well for what it does. The problem with the Transactions, for me, is that it simply does not serve enough of our members. It serves a very narrow segment—we’re all here. And we love it.

Actually, some of us view the IEEE Transactions on Automatic Control as “all beef.” Others think it’s all baloney. I think what it does, in fact, it does very well. I do not think it is going to change very much, and I do not think that is bad as long as the Society is willing to contribute substantial funds to CSM. These funds will come back through advertising and enlarged readership in CSM. I can’t help but recall that when this discussion about the Transactions’ service to the membership took place in the late 1970s, the result was the creation of CSM. There was a big effort to see how we could change the Transactions. Nobody was reading it: too many esoteric theoretical papers, and so on. At that time, the answer was, and I think it was a very good answer, to develop a magazine. Now we have a magazine, but the poor little anemic magazine doesn’t have enough money to publish enough papers. It has about 16 technical pages per issue, four times a year: 64 pages of technical stuff, and another 64 pages of news and ads each year. It has been successful—obtaining ads, even though there is very little technical material. Can you imagine the impact that it could have if you tripled the budget. You could triple its advertising almost overnight. Then, we would have a magazine that everybody could read.

I think that if it’s true that 75% to 90% of our readers in the control field cannot read the Transactions, then we have to do something for them. It should be something that we could be proud of, and they could be proud of. I think that would be a very attractive force in getting new members. If we couldn’t double our membership over a five-year period, I’d be very surprised.

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