When my friend and colleague Marc Cheves asked if I would consider writing an article about education for the charter issue of The American Surveyor, I pondered for a time on what to write. My final decision was to examine and to evaluate why land surveying programs are floundering and closing. Capsulized here is the fruit of my thoughts, a cry to the profession in general and to each and every surveyor. Let us do something to save the profession, to keep it from going the way of the Dodo bird and the Passenger Pigeon, before it is too late.

The Problem
It is a matter of general professional knowledge that while many schools of surveying are just keeping their heads above water and are threatened with closing, others have already been terminated. Still others have been assimilated into engineering programs or other disciplines.

In order to seek the whys and the wherefores, with no finger pointing intended, let me diverge as to my thoughts on surveying. In the many state associations and within ACSM-NSPS, we have studied why people do not join organizations, spent needless monies preparing model laws and trying to define who we are, and how to be ethical and professional, yet we have never studied the personality of the young men and women who are drawn to the surveying profession. Many state societies have initiated Trig Star competitions to reward those with a talent for trigonometry. But has even one of the TrigStar winners ever become a surveyor, or have they just taken the money and gone on to become engineers or doctors?

As a profession we have never attempted to analyze who we are, what we are, and why we are. Rather than write a new model law, why not spend some of that money to attract the kinds of young men and women who fit the profile of the Surveyor, then let us start early, perhaps in the 3rd or 4th grade, and target our surveyors of tomorrow.

Who fits the profile? Think about the surveyors you know and what they have in common. From my experience, a surveyor is someone who possesses an independent nature, who has a firm foundation and understanding of law and technology. Surveyors are unique. They tend to be intelligent, principled, oriented to the outdoors, pragmatic, and not adapted to doing routine activities, and possibly terrified of theoretical concepts, higher math, and the belief the law will prevail. Surveying appeals to history buffs, to the rugged outdoors types, those who love to solve problems, and even to those individuals who love to argue!

Perhaps the profession of surveying is best represented by a tool with which all of us are familiar—the tripod. The modern surveyor must meet three demands to survive and grow in the modern world: education, registration, and reputation.

Education
Having talked with students across the country, having shared beer and pizza and conversations late into the evening; many topics have come to light. They tell about the subjects they study, how they are taught and by whom they are taught.

These encounters have led me to coin a phrase that I believe many of the programs today suffer from: Institutional Constipation. Many of the programs are “bound up,” and as such new ideas have trouble passing through the institutions. This is no fault of the professors, but rather the administrators.

Most surveying programs are dominated and directed by engineering programs, with a major emphasis on higher math (one particular college requires three courses in calculus). In my opinion, and from my 50+ years of experience, calculus is the most useless subject a surveyor can study, unless he or she wants to teach. Trigonometry, both plane and spherical, geometry, statistics and logic will better serve the surveyors of today and tomorrow than will calculus. In late night sessions in which students bared their souls to me over a bottle of beer, their loathing of this one course was universal.

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Along with more meaningful math courses, the schools must realize that it is likely that the surveyor of tomorrow will not work for a large firm. Statistically, most surveying firms are relatively small with the principal working in the field along with his/her employees. I believe that surveying programs should include some courses in business as well as humanities.

It has been my experience the average surveying student is a frustrated lawyer. He or she tends to ask questions as to why things happen, or wants to know the law. They want to know how to identify wood remains or how to analyze ancient documents. They do not want to know how to design a bridge. If many surveyors had wanted to become engineers they would have registered in an engineering degree discipline. Surveyors must have their own identity separate from other professions. Being tied to the engineering programs with an umbilical chord is not the way.

Perhaps the greatest cause of institutional constipation I have found is the academic requirement that in order to teach, a professor must have a PhD. Once the professor opens the door, nothing will keep a student who wants to learn from learning, regardless if the professor has a PhD or not. Some PhD’s teach from the book and not from experience.

Colleges and universities must realize that the number of degrees and abbreviations placed after a person’s name is no indication of his or her knowledge of surveying or the ability to open the door to desire. The institutions should establish adjunct professors to teach specialized subjects. Give me a teacher who is respected as a leader in a specific discipline of surveying and the students who want to learn will come to sit before the feet of the master.

I cut my first survey line over 50 years ago. I selected and elected every survey course and law course that was taught in my undergraduate university degree program. I designed my own career academically, but the students of today do not have the same flexibility. The academic community must be flexible and available to meet the needs of a diverse group of students.

Suggested Solutions
First, every state cannot afford its own surveying school. I propose we divide the country into regions with similar surveying history and legal problems, select a university in each of the several regions of the United States and concentrate on offering surveying programs of distinction. These programs could call upon the law schools, business schools, engineering schools and other schools attached to the university and these courses should be made available to the surveying students. This will necessitate the institutions abandoning present restrictions to which non-resident students are subject in the form of out-of-state tuition and resident-only aid or scholarships.

Second, we need an analysis and overhaul of course structure and contents, with an emphasis on having core subjects in studies in some of the fine arts and personal development. This must include common development courses in field studies, evidence, law, and forestry and soils. At the end of a summer study program or at the end of the basic courses, the student would be required to elect a program for degree for graduation, either in the business or in the legal aspects of the surveying profession. If so designed, the legal avenue could possibly be designed to meet the requirements for a pre-law degree while the business avenue could satisfy a pre-business requirement.

Third, academic institutions must realize that simply having a PhD does not make a survey educator. These proposed regional institutions and even the existing institutions must also incorporate into the teaching community men and women who are not PhDs. The smartest and most well versed technical surveyor I ever had the pleasure to work with had only a simple BS degree. In WWII, he taught geodesy and celestial navigation to Air Force navigators. He could balance a traverse in his head without the benefit of looking up sines and cosines. He taught me more about theoretical computations and the understanding of the effects of daily magnetic variation and the care of the magnetic compass than I learned in college.

Another experience was at summer camp where Jim Youle, a Forest Service retiree, taught me field mapping. Jim had invented the Abney Level. There are numerous men and women whose knowledge can be tapped. Why not offer opportunities to some of the surveyors who have been successful in business, photogrammetry, surveying, law or specialized fields of surveying to teach on an ad hoc basis?

Registration
Students universally tell me it is their ultimate goal to become registered. However, because all surveyors are not qualified in the same disciplines, we need to establish a national surveying license that will permit the holder to then be further examined in specific fields such as geodesy, photogrammetry, boundaries and real property, topography, riparian, and even forensic surveying that would include being considered as an expert witness in the respective court of that state. After completing the national examination, a surveyor who resides in one state and wishes to conduct boundary surveys in another state would only have to be examined on the requirements for boundary surveys in that state.

As I see it now, some surveyors are using registration as an opportunity to restrict non-resident surveyors from competing for business. From personal experience, I applied for registration in a Western state that recognized comity. However, after sending in my application along with my fee, I was informed that my 45 years of experience, four college degrees, and numerous foreign work experience did not qualify me for a license by comity. I then requested they send me a list of books I should study in order to prepare for the exam. Ironically, of the four books on the list, I had co-authored three of them! This demonstrates a classic form of protectionism. If we had a national registration, I envision a more diversified surveyor, a better trained surveyor and a surveyor who can be more marketable in the profession. This does not imply that every surveyor will seek multi-state registrations. There will still be the surveyor who will spend his or her entire life in a single county or state, but it would require specific licenses in his/her areas of specialties.

With legislatures and registration boards placing more and severe restrictions of the free movement of the foreign registered surveyors, they are in turn hampering young surveyors from becoming a marketable commodity in society.

I feel that most Boards of Registration are “toothless tigers” in that they have little power of enforcement. Also the appointment to the Boards usually is to political favorites. Yes, some governors do seek recommendation from the surveying communities, but that is not always so. Every now and then the system goes astray. One fatal appointment can set the profession back many years. I offer three possible solutions.

1. Eliminate all Boards and let business and the courts determine “good work and bad work” through profits and negligence. (I do not recommend that, but it is a possibility).

2. Make membership on a Board elective. Have potential members run as if they were running for an elective office. Then the RLSs can elect those individuals in whom they have confidence.

Give them adequate powers to guide continued
the profession. Threats get nothing. The Boards should lead by example. We should realize what the position of the Boards really is. Boards are supposed to “Protect the public’s interests,” however, I do not believe that is so. In my own practice most clients do not really care about standards, etc. The first questions they ask: How much does it cost? Can you do it cheaper?”

3. The third possible solution is the establishment of an integrated society. When a person becomes registered, automatically that individual becomes a member of the professional society. Then the society is given the responsibility to police its members. In order to practice as a surveyor one must be a member of the society.

Reputation
I am proud to be a surveyor. I am proud to be an attorney. I would make these choices again.

I defy any reasoning why we must have mandatory continuing education, when every professional knows and realizes that one cannot meet the demands of the modern world with antiquated and outdated knowledge and education. The more education a surveyor has, the quicker the surveyor will realize that remaining current is an absolute necessity. There are instances when it is much easier to spend money than time. The professional must make time to remain current. I learned many years ago that one’s professional reputation can be ruined in an instant, and to regain a lost reputation is virtually impossible.

In Summary
The surveyor of this 21st century cannot attempt to practice in today’s competitive world using yesterday’s tools. The modern surveyor must first seek a solid foundation predicated on formalized education, with adequate basic subjects in mathematics (not calculus), tempered with personal improvement subjects, business, humanities and field studies, culminating in a specialized survey camp taught by veteran surveyors. Academic institutions must realize that an academic degree does not assure that the individual will impart knowledge that will be usable to the student.

The modern surveyor must be led by Registration Boards which are independent in nature, free from political influence, and staffed by men and women of our choosing. Serving on such a Board is an honor and we must realize that.

If something isn’t done soon we all may very well be adding yet another verse to Pete Seeger’s song “Where Have All the Flowers Gone?”, a verse which begins “Where have all the surveyors gone? Long time passing...” and ends like the others with, “When will they ever learn, when will they ever learn?”

Walt Robillard, principal of World Boundaries, is a specialist in local and international land boundary disputes. He has taught at major universities, co-authored college textbooks, and is a popular presenter at national seminars and continuing education courses for attorneys, surveyors, engineers and foresters.

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