

TECHNICAL OBSOLESCENCE : A SURVEYOR'S DILEMMA

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In the past decade the individual surveyor has been plagued by the awesome possibility of technical obsolescence. Many like to think of the computer as the turning point, but many things seemed to occur "all at once". It is a study in itself to determine how the 1950-vintage surveyor grows, or even exists, in this revolutionary world of electronic distance meters (EDM's), north-seeking gyroscopes, lasers, and orthophoto maps.

Technical obsolescence not only occurs in the physical aspects of an individual and the specific "tools of the trade", but it all too often occurs in the mental attitudes of the individual towards the accomplishment of his job.

Obsolescence literally means getting old or out of date — outmoded — a kind of style no longer current. This is exhibited at each birthday as one more candle is added to the cake, one more inch to the waistline, or one less hair to the head. Personally, we can do nothing about the candle, we can jog to take care of the waist and can use a washcloth to comb the hair, while we wonder what happened to the old stick shift or the narrow necktie.

Webster defines *technical* as "having special use, practical knowledge of a mechanical or scientific subject, marked by or characteristic of specialization". This is certainly characteristic of any organization or profession, such as surveying.

Using the combination of the two words, *technical obsolescence* can be envisioned as transcending both the individual surveyor and his equipment; or, if viewed from a different perspective, it can be technical obsolescence of the mind and of matter. The one — *matter* — can be solved easily by money; the other — *the mind* — is a more difficult area for solution.

As the individual is analyzed today, we find the surveying profession

manned or staffed by two diametrically opposite types : the college-trained surveyor-engineer (the other professions, i.e., forestry, geographics, etc., are not excluded) and the registered practical surveyor of limited education and abundant experience. Both of these types are equally affected, for technical obsolescence is a result of the attitude of the individual as it is shaped by his background, education, and experience.

The first step in solving a problem is to recognize it. The first symptom is one of inability to ingest a portion of the technical and peripheral matter that is written each year. Annually over 100 000 articles, pamphlets, technical releases, theses, brochures, studies, etc., come in a constant stream. The printed word is profuse. The simple task of daily reading is one of critical selection or separation and is time consuming. As a result of being selective, the individual becomes more and more myopic in his attitudes and planning.

Like the "early bird" waiting for his worm — in six feet of snow — we have a habit of waiting for research or equipment to solve our problems. This can include anything from being able to operate within the limits of our abilities to waiting for computers to make decisions.

First, the functional limits of an individual increase as he gains new knowledge, and the computers don't — or can't — think, people do. People solve problems, computers don't. Research and computers generate ideas in a form that usually is not usable to the average surveyor. The individual must take each idea and then must "plug" it into *his* system, nurture it, feed it and then, when it is hatched, relate it to his problem.

Obsolescence has us surrounded and, as a result, has limited our acceptance by other professions — we have not made the "big leagues". Each individual surveyor prides himself on his number of years in the practice, and, as a result, has become more knowledgeable and proficient in a specific specialty. Yet surveying encompasses a vast and broad spectrum as witnessed by the 100 000 articles mentioned, most of which hold absolutely no interest to the surveyor. The statement heard at annual meetings : "It was fine, but there weren't enough talks about remonumentation" (or whatever you desire). The individual has a moral responsibility, not only to himself but to the profession, to sample and to read the trends — the fads, the "kooks" — in order to maintain at least a knowledgeable acquaintance with the present and to sever the hold that the past has upon him. The major cause of this technical obsolescence in the individual is directly attributable to a lack of curiosity and specialization to such a degree that to assimilate any new ideas requires too much energy.

How can the problem be combatted ? The first is by the individual. To keep physically strong requires exercise. Then to remain mentally agile, mental gymnastics are required.

Personal reading in all fields will keep the mind young; this includes the fields of education. How can a surveyor remain competent in all of the subjects and phases of his profession ? He can't. None of us have sufficient time to achieve a true competence in all of the phases of our profession. Thus, we must then recognize that perhaps our ob-

solescence is a failure to recognize each other's talents. Each must realize that someone has developed a competence from which the rest of us can learn. To do this will require a curiosity about our fellow professionals and our neighbors. Those companies that inbreed and build a morale where they convince themselves and their employees "That we are the best and the greatest" are earmarked for obsolescence. The danger lies in believing that no one else has anything of value to offer. The solution is simple: Get to know your fellow surveyors and neighbors, and while conversing exchange information, pick up new ideas, and expand your knowledge. The greatest and most fertile ear of corn resulted from cross-pollination.

Contact with educational institutions in the form of research and short courses are methods of this "cross-pollination". There are not enough days in the year to hold down a job as well as to attend *all* of the meetings, seminars, and symposia that are held. It is entirely possible to stay perpetually on the expense account — running from meeting to meeting.

The problem of personal technical obsolescence cannot be separated from our past, present, or future (continuing) education. Basically we are looking for a product to sell. The product this time is the increased value to yourself, your profession — and even your country — over your cost of existence. The difference of cost to value is profit, but profit of ideas or return.

The technical obsolescence of the tools of our trade is relatively new to most. Prior to the mid-1950's, most were complacent to use the 1-minute transit and the 100-foot tape. These two items represented a major investment for some, many years previously, but still they accomplished the job at hand. A simple matter of economics prohibited many surveyors from indulging in self-leveling levels or EDM equipment. But, as technical demands increased relative to services performed, small firms were unable to keep the pace and were forced into the purchase of new equipment — at times, at a drastic financial hardship.

To witness the dynamic nature of the industry today — many of us span the gap — we remember the gradual change of the carpet sweeper to the vacuum cleaner, and the ice box to the refrigerator. We could accept these because, when once purchased, each served the needs, and would be kept until old age or children made them inoperable. This was the condition with the equipment we used. Many are still tied to the World War II impression of the bomber crew who trained, fought and, at times, died as a complete unit with the olive-drab plane, affectionately labeled "The Blonde from Boston" and appropriately represented by a nude buxom girl painted on its side.

Today, housewives change vacuum cleaners to get one that disperses room freshener as it cleans, or change refrigerators to suit the color of the kitchen, and the bomber crew is a team of men individually trained and individually assigned to each mission — each time in a different plane — to meet the technical needs of the operation.

No longer can we look upon the new equipment that is purchased as we looked upon the old brass transit that Grandpa used. Equipment is

for one purpose : to accomplish the job. To use, but not abuse. With the rapid introduction of equipment today, no sooner has it been purchased than it is obsolete — design-wise. We must realize that equipment does not wear out; it becomes obsolete. However, a piece of equipment that is obsolete for one surveyor means an upgrading for the second. This is exhibited in the fact that little or no used surveying equipment is available for purchase.

In analyzing obsolescence of equipment, the job at hand is of major importance. The equipment needed should be determined by the job to be accomplished and not by sales pressure or personal whim. Recently a surveyor in North Carolina purchased a north-pointing gyro theodolite system to isolate a "bust" in the survey of a cross-country transmission line. The "bust" was located. Did the gyro then become obsolete? No! The new equipment generated more work. As equipment is added to a crew, new and more effective uses will be developed that were never anticipated at the time of purchase.

The Model 4 Geodimeter is more precise than the H-P 3800, but it has been replaced in many instances, because it required a pickup truck and four men to carry, but it still works and is still reliable. On the other hand, the Model 4 may be a major upgrading for the small single-crew firm which was unable to justify the cost of new EDM and which still relied upon the chain tape.

This is exhibited equally well in the field of computers. By the time a computer is installed and the operator trained, a new model comes out — one that is faster, more versatile and, at time, less expensive than the original. These modern changes must be accepted as part of the normal routine plans for any project. Two questions arise : whether to buy and when to change.

There is no general rule that can be used to determine if or not to buy. But, if the surveyor considers his equipment as an individual and if he needs to put one more man on the payroll, he can afford a piece of equipment. This piece of equipment can be considered then as a replaceable individual when it ceases to produce. The idea originated in the late 1940s and early 1950s in the logging industry. When an individual crew, after working piece work, decided to purchase a new power saw, it became part of the crew and was paid as a crew member. It became obsolete when it failed to produce its share and was then replaced.

The area of sentimental attachments to equipment is gone; perhaps it should never have been. Like the fire horse who served faithfully and efficiently, a transit, when it became obsolete, should have been "turned to pasture", but because Grandpa used it we still believed it could do the job. Obsolescence in equipment should be planned for in a functional office, because it is with us and will continue to be.

We cannot complete our primary job of surveying in remote offices, far from the fields of mud, flies, chiggers, snakes, poison ivy, and irate landowners. It is the field crews who usually come into contact with the public and it is here in the field that the "image" of the profession is formed.

We should take pride in the fact that as a profession we can recognize the symptoms of *technical obsolescence* and that we can muster the knowledge and the desire to meet this challenge before we become extinct like the wheelwright or harness maker.

Obsolescence is really not of a great magnitude in our profession generally, but rather it is one of a personal nature. Each individual has the responsibility of determining his own placement within the profession and whether he is exhibiting the symptoms that could foretell professional disaster.

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