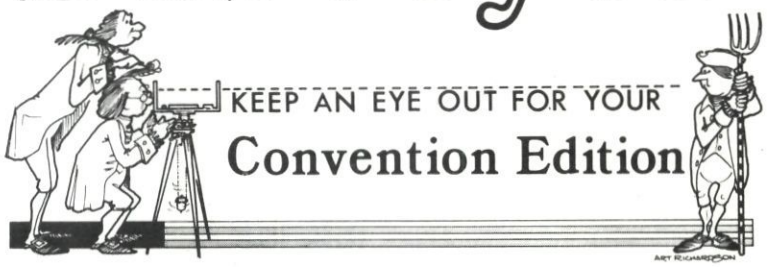
CALIFORNIA LAND SURVEYORS ASSOCIATION 1966
CLSA
Institutional Affiliate of American Congress on Surveying and Mapping

The California Surveyor



No. 40 WINTER EDITION 1975

COMMITTEE REPORTS ON L.S. CURRICULA ACCREDITATION

by C. A. Wooldridge, Education Coordinator

California is number two! Yes, the state that should be the nation's leader came in number two! So now let's make the commercial come true. Let's try harder.

California is the second state in the nation to recognize the need and activate a system of accreditation for land surveying education. We let Michigan lead the way, but our Board of Registration for Professional Engineers adopted the report of it's Ad Hoc Committee this year establishing procedures and standards for the accreditation of Curricula in Land Surveying.

Why was this needed, and how did it come about? We all know Land Surveyors whose education counted as part of their required experience to take the licensing examination. How come we now need something new?

The reasons go back in history. (History has been defined as those events that happened before the individuals concerned were interested.) Probably in California they go back to the "good old days" when we had a Surveyor General. He was the extremely wise and knowledgable surveyor empowered (among other things) to issue licenses to Land Surveyors.

Or maybe it started when the public health, safety and welfare finally required the registration of Civil Engineers. After all, by 1929, Civil Engineering had become a distinct and separate part of the survey-engineer profession. A good many of the then licensed surveyors were grandfathered in as Civil Engineers. Then, as now, there were many aspects of the two fields of endeavor that were inseparable.

Others would say that the story started in 1939, when the legislature granted the Civil Engineer exemption from the licensing requirements of the Land Surveyors Act. Even those engineers who were registered without having served an apprenticeship on a survey crew, had been forced to learn surveying in school, and probably spent a summer in survey camp.

Then in 1959 the American Society of Civil Engineers took the problem to task by defining what part of surveying was Civil Engineering. (Of course, by then, our laws stated that all surveying defined in the Land Surveyors Act was part of the Civil Engineering field.) ASCE recognized another disturbing trend at that time, and urged the engineering schools to quit deleting surveying from their curricula, to no avail.

In the meantime, and since, the knowledge explosion has continued, not only in surveying and engineering, but in every facet of life. Accreditation of curriculum has become big business. Fortunately, all is not chaos, because even the accreditation organizations could see the problems if there were two bodies attempting to accredit in the same fields. They have therefore formed an umbrella association to ensure that this does not happen.

(Continued on page 14)

NEWS FROM THE BOARD

by Ray Thinggaard

Some colleges and Junior Colleges in California may soon have an accredited land surveying curricula. The board recently approved a report submitted by an ad hoc committee comprised of licensees and educators and has since sent letters to the chancellors of California's higher education institutions informing them of the possibility of accreditation. Without accreditation a school's graduates will find that their education will not reduce the prescribed experience necessary for licensing.

Due to past confusion on the matter, this year letters to failing examinees will include notice that they have 60 days in which to appeal the results.

The board recently received the final report from the ad hoc Committee on Professional Development and referred it to the board committee for recommendation of appropriate actions.

Pursuant to A.R.-49, the board recently established an ad hoc committee to study and define the exact meaning of "Responsible Charge."

After 1½ years the board received the Attorney General's opinion #CV 74-1 which was requested to define what constitutes fixed works. In essence, the opinion suggests that grading plans when prepared relative to the establishment of permanent structures shall be defined as fixed works. The opinion was referred to the ad hoc committee which accepted it with some dissention, but has not yet made any recommendation for board action. The ramification of this will affect every surveyor in California who files subdivision or parcel maps

(Continued on page 9)

Legislative Surveying, Buy A Transit, Run A Mile

Contributed by James N. Dowden L.S.

The following are excerpts from the Statutes of the State of California 1867-68:

CHAPTER CC.

An Act to purchase a transit instrument for the office of the Surveyor-General.

[Approved March 19, 1868.]

The People of the State of California, represented in Senate and Assembly, do enact as follows:

Purchase of Instrument.

SECTION 1. The Governor is hereby authorized to purchase of Mrs. Emeline Mathewson the transit instrument manufactured for the late Robert C. Mathewson, in Germany, for the use of the Surveyor-General's office of this State, for any sum not exceeding two thousand dollars.

Appropriation.

SEC. 2. A sum not exceeding two thousand dollars is hereby appropriated for the payment for such instrument; and the Controller is hereby required to draw his warrant for the same, upon the certificate of the Governor that such purchase has been made.

SEC. 3. This Act shall take effect from its passage.

FEE SCHEDULE FOR COUNTY SURVEYORS

County Surveyors.

SEC. 13. For the first mile actually run with compass and chain, two dollars; for each succeeding mile, one dollar and twenty-five cents.

For each mile run with compass alone, one dollar.

For each lot laid out and platted in any city or town, one dollar.

For recording a survey, seventy-five cents.

For calculating the quantity of every tract of land or any subdivision thereof (town lots excepted), fifty cents.

For travelling to the place of survey, for each mile, in going only, fifteen cents; and if he shall be required and duly notified, verbally or otherwise, to make other surveys while in the discharge of his official duty while in the field, he shall be entitled to mileage only from the place last surveyed by him.

For ascertaining the location of every town lot in an old survey, measuring and marking the same, one dollar.

For copies and certificates, per folio, fifteen cents.

For erecting a monument at the corner of any survey, when required, one dollar.

For erecting a monument when running a line at a variation or offset, when required, twenty-five cents.

For copy of plat of any survey and certificate required by any person, or to be transmitted to the Surveyor-General, one dollar, to be paid by the party requiring the survey.

Expenses of assistants shall be an additional charge, to be agreed upon between the parties, or in cases of surveys ordered by the Court or Board of Supervisors, such compensation ?? shall be by them allowed. ▲

The California Surveyor

is the quarterly publication of The California Land Surveyors Association and is published as a service to the Land Surveying profession of California. It is mailed to all Licensed Land Surveyors and Land Surveyors in Training in the state of California as well as to all members of California Land Surveyors Association. The *California Surveyor is an open forum for all surveyors, with an* editorial policy predicated on the preamble to the constitution of the California Land Surveyors Association and its stated aims and objectives, which read:

"Recognizing that the true merit of a profession is determined by the value of its services to society, the 'California Land Surveyors Association' does hereby dedicate itself to the promotion and protection of the profession of Land Surveying as a social and economic influence vital to the welfare of society, community, and state."

"The purpose of this organization is to promote the common good and welfare of its members in their activities in the profession of Land Surveying, to promote and maintain the highest possible standards of professional ethics and practices, to promote professional uniformity, to promote public faith and dependence in the Land Surveyors and their work."

Advertising

Commercial advertising is accepted by "The California Surveyor" and advertising rates and information can be obtained by contacting the Editor, P.O. Box 3707, Hayward, CA 94540.

Classified advertising is published at the rate of $2 per line for members of C.L.S.A. and $4 per line for non-members and should also be directed to the Editor of "The California Surveyor."

Sustaining Membership

Membership in the California Land Surveyors Association as a sustaining member is open to any individual, company or corporation who, by their interest in the Land Surveying profession, is desirous of supporting the purposes and objectives of this association. For information regarding sustaining membership, contact the Editor of "The California Surveyor."

Editorial Material

All articles, reports, letters and contributions are accepted and will be considered for publication regardless of the author's affiliation with the California Land Surveyors Association. Material should be sent to "The California Surveyor," P.O. Box 3707, Hayward, California 94540.

EDITOR: Michael S. McKissick, L.S.
P.O. Box 3707
Hayward, CA 94540 Phone 415-581-1070

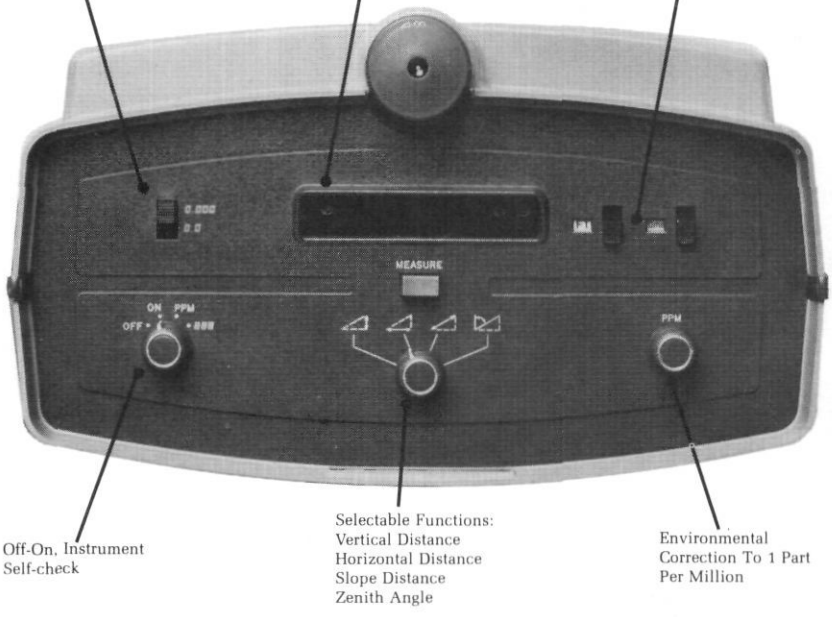
DEADLINE DATES FOR THE CALIFORNIA SURVEYOR

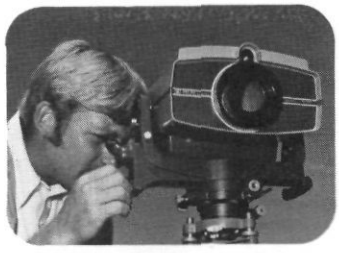
Spring/Convention . . . . February 7, 1976
Summer . . . . . May 15, 1976

Articles, Reports, Letters, etc., received after the above mentioned date will be placed in the next edition.
Editor

New-Total Station.

Angle and automatic horizontal distance measurements from one instrument.





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Point the HP Total Station, press one button, and it quickly measures your slope distance, zenith angle, corrects for curvature and refraction and automatically computes and displays your horizontal distance. This time and money saver also has a tracking mode that drastically shortens layout time—making readings every three seconds to speed you from point to point.

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Company _____

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Fareed Comes To FSU

by John M. Camacho

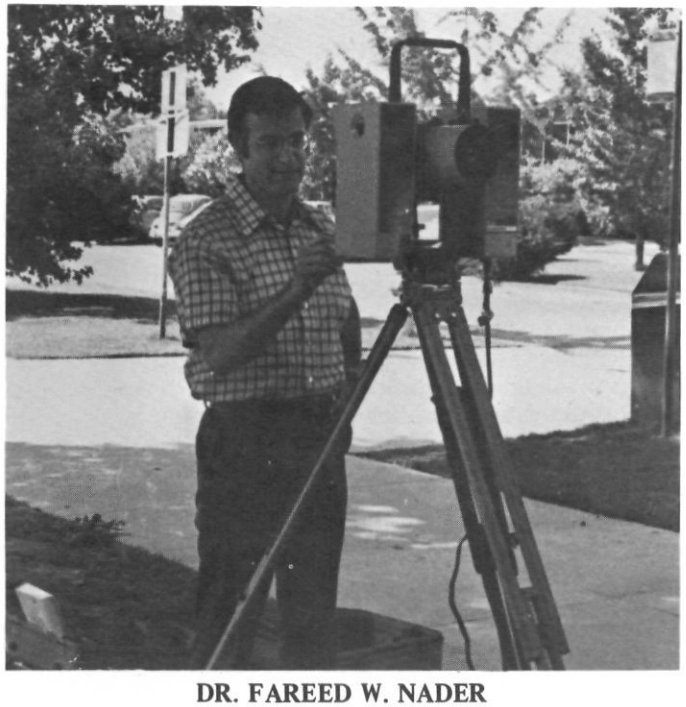
Another asset has been added to the Surveying and Photogrammetry Department at Fresno State University. If you are thinking of another Wild A-9 plotter, a Kern DKM-3 thedolite or maybe an HP calculator you are mistaken.

This blessing is in the form of a man with spectacles. His model number is Dr. Fareed W. Nader.

He came to Fresno State from the University of Hawaii where he taught Surveying since 1969. Dr. Nader has a strong background in surveying and mapping. He has worked for different governmental agencies including the Federal Aviation Agency, the Bureau of Land Management and the Forest Service.

Like most surveyors he just stumbled upon his true life's work. He confides that surveying was his only fun course while an undergraduate at the University of Arizona. Besides, this course managed to keep him outdoors.

He got a B.S. degree in Surveying at the University of Arizona. They didn't have a masters program in Surveying at the University of Arizona, so he went ahead and got a masters in soils mechanics. This wasn't quite what he wanted so he eventually acquired a Ph.D. in Surveying and Mapping from Perdue University.



DR. FAREED W. NADER

His teaching experience leads us back to the University of Arizona. His cousin, obviously the guiding light, convinced Fareed to try Teaching. He did so at the University of Arizona. He also instructed at Perdue and somehow ended up teaching Surveying on the beaches of Hawaii. Dr. Nader teaches elementary and geodetic surveying this semester. He takes the task of teaching geodesy next semester.

Dr. Nader is a man that sees an unlimited future in surveying. He professes who the art of surveying is rapidly being upgraded to meet changing needs. When asked to impart words of wisdom on the subject he enthusiastically remarked, "Men, there ain't nothing better than surveying." ▲

C.L.S.A. Educational Activities

by Chuck Wooldridge, Education Coordinator

The California Land Surveyors Association has been proclaiming for quite some time now that lack of education is the surveyor's greatest handicap and biggest problem. But our funds and manpower commitments have indicated otherwise. 1975 has seen a change and the trend is being reversed.

Major effort the first part of the year was to not call on committee members, to leave them free to serve on the Registration Board Ad Hoc Committee. (The resulting accreditation report is reviewed elsewhere in this issue.) Now comes the task of notifying schools of the available accreditation, pointing out the value and reasons for it, and helping them meet its requirements. Other members will be available to serve the Board on accreditation teams.

Another accomplishment was presentation of California's third Cadastral Retracement Workshop in cooperation with the San Diego Chapter. It will not be presented in this state again in 1976 (but will be presented in Reno on May 17 & 17, 1976). The presentation was recorded on TV tape and is being edited for short, stand alone programs. Another workshop subject is being developed for statewide presentation (but press time deadline precludes determination of topic).

Other matters under study by the Education Division are short seminars and discussion groups. The coming year promises to be a busy one, and the committee will need more help if it is to succeed with its tasks. Interested volunteers should contact the Coordinator.

1976 CONVENTION APRIL 1-3

LEAGUE OF CALIFORNIA SURVEYING ORGANIZATIONS — NORTH SECTION

by Myron A. Lewis, L.S.

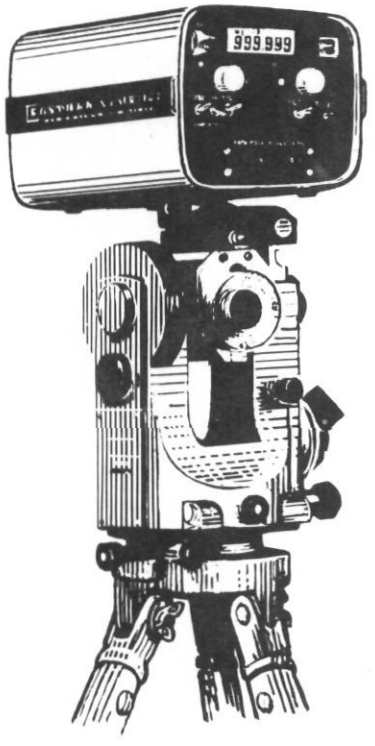
The Northern Region of the League of California Surveying Organizations will be mailing out in November a compiled report from replies to Committee questions. The report will cover Records of Survey Form and Content and Survey Information Repository. This report will be sent to our existing mailing list.

A representative of our Group would like to have the opportunity to talk at a monthly meeting of the private sector surveyors' organization in order to explain the purpose and aims of our Northern Region Group. We also would be happy to answer any questions you may have.

Attendance at meetings should include at least 50% from the large private sector. Because of the wide geographical area that we represent, a portion of the meetings will possibly include short Committee meetings.

As a reminder, the League is not just another organization to join but a Group composed of representatives and/or alternates from already existing survey organizations.

For additional information about the League, contact Myron Lewis, City of Hayward Engineering Division, 22300 Foothill Boulevard, Hayward, California 94541. ▲



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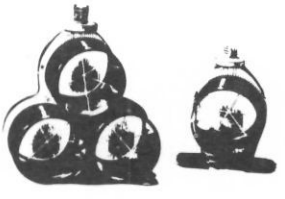

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The Education of the Future Professional Land Surveyor

Part III . . . this is the final installment of a three part serialization of the presentation given at the California-Nevada L.S. Convention in March 1975.

by Dr. R. Ben Buckner
Department of Geodetic Science
The Ohio State University

The Main Components of the Program *General Comment*

University, college, and departmental requirements vary at different institutions. Course offerings, course content, faculty availability, faculty interests, laboratory space, and equipment available also vary. Some schools operate on a semester system, some on a quarter system. For these reasons, no unique outline of a curriculum would be appropriate. See the recently approved program at Ohio State, which although expected to be refined, serves as a first approximation of what one institution developed as possibly workable.

Fundamentals

Mathematics through calculus, physics taken by engineering and science students, graphics, computer science, and English would be basic foundation courses and would take up most of the freshman year. Social science and humanities would be included as required by colleges and universities and can also be considered as part of the fundamentals. The fundamentals are the first phase toward developing professional thought. The fundamentals courses provide a foundation on which to build other topics, give some awareness of the needs of society (and thus professional responsibility to society) and provide mediums for communication.

The Core

The most important single component of any professionally oriented program is the core of courses required of all students who will be permitted to graduate with the degree. There are two extreme approaches to the construction of this core. At one extreme, the assumption and philosophy is that the profession is so well defined that the core should be inflexible and few, if any, technical electives permitted. At the other extreme is the assumption and philosophy that the profession lacks definition and is so broad in fact that there would be few courses required in the core but a large number of professional "options" provided. As regards the surveying profession, this author would suggest that the approach be somewhere between those extremes but with a leaning toward the stronger core and a few well defined areas of specialization and ample electives to define these areas. Most practicing Surveyors and educators would agree that the core should contain topics comprising elementary surveying engineering and construction surveys, survey computations, and some field applications and practice. Many would agree that at least one course should be included in the areas of property surveying, photogrammetry and control surveying. Beyond these requirements, this author would include a very broad base in topics related to both the art and the science of Surveying. Courses comprising surveying history, legal principles of boundaries, land subdivision and planning, and survey measurement theory must be included. To round out the background necessary to mold a professional Surveyor whether he will engage in property surveys or specialize in some other facet of professional surveying, additional core courses should be included in photogrammetry, geodesy, photo interpretation, adjustments, computer science, cartography, law, physical sciences, remote sensing, and environmental surveys. When all of this is included, the core comprises perhaps one-third of the total four-year degree requirements, say 40 to 50 semester hours.

This author would suggest a minimum of 40 semester hours of courses in the core with minimum of 12 semester hours devoted to surveying fundamentals, 12 semester hours to the art of surveying practice, and 12 semester hours to the scientific or theoretical aspects of surveying. Both of these latter two sets of 12 credit hours should be considered as upper level courses designed to develop both the art and science of professional surveying.

Another group of courses classified as college, university, and departmental requirements can be designed, in part, to support these core courses. For example, suggested lists of non-technical electives can be compiled which include courses appropriate to surveying. But these would not be considered part of the core courses.

Professional Areas of Specialization

Any profession has its specialities. In civil engineering for example, students select from among structures, construction, sanitary engineering, transportation, or other such options. Surveying specialities should be devised to reflect professional aspects, not just types of surveying. In this sense, engineering surveying or construction staking would hardly be considered professional areas of specialization. But property surveying would be considered as a professional area. Photogrammetric and geodetic control surveying might also be considered as a professional area. As envisioned by this author, the professional areas of emphasis might be: 1) Boundary Relocation Surveys; 2) Topographic and Control Surveys; 3) Community Design (or Subdivision Planning); 4) Environmental Surveying and Analysis. The reason for the first of these should be obvious. The second area deals with the more scientific aspects of surveying. The third area deals with the aspect of surveying practice that requires knowledge and understanding of land planning principles for the proper creation of new land subdivisions. The fourth area adds the new dimension to professional surveying that has been discussed previously. Other breakdowns of the areas are logical. Land, Engineering, and Subdivision Surveys could be combined into what might be considered Surveying "art" with Geodesy, Photogrammetry, Cartography, and Remote Sensing combined into a separate area emphasizing the "science" of Surveying. There are several possible ways to divide Surveying into professional areas. What is important is that each area be well defined and its name should suggest some professional area into which a graduate might logically specialize and earn a living as a practitioner or employee of a private firm or governmental agency. What is also important to recognize is that there are specialities which different students will wish to emphasize,

(Continued on page 21)

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The new Ranger IV EDM System incorporates the latest advances from K&E, a leader in EDM. Here's what we've done to make EDM an even better answer to the kind of surveying problems you have today . . . for distances of 3 feet to 8 miles:

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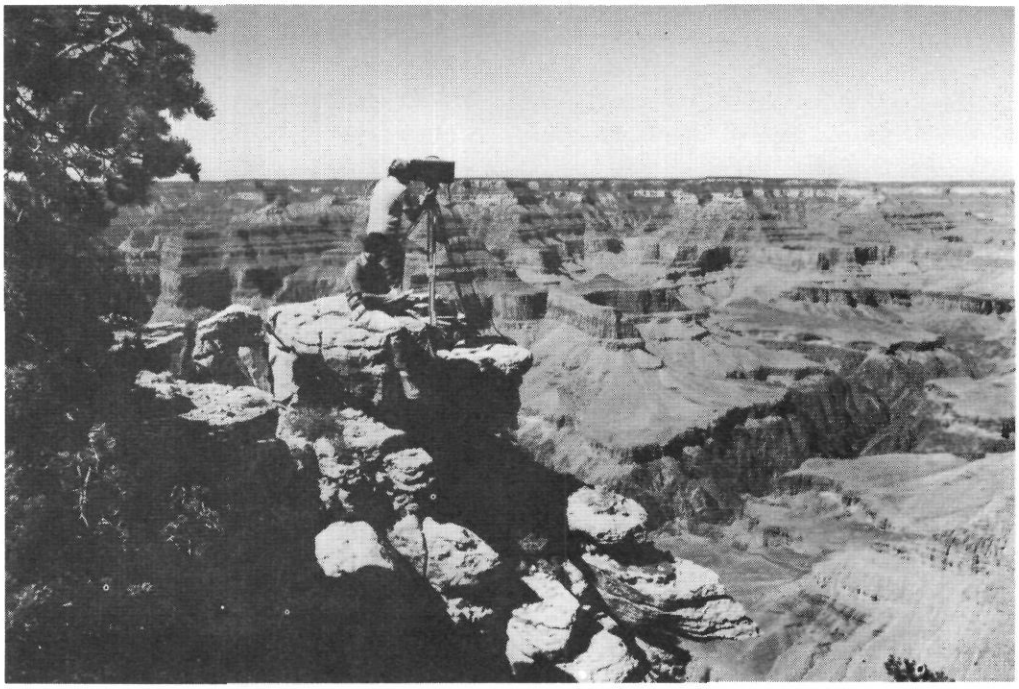
- ☐ Illumination of signal meter and telescope makes night use easier.
- ☐ New highly stable yoke design.
- ☐ A key lock prevents unauthorized use.
- ☐ Cable release for cold weather use.



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CONVENTION - 1976

The Convention Division of the California Land Surveyors Association announced tentative plans for its annual convention to be held in the Los Angeles area April 1-3, 1976. The site for the convention is the beautiful Sheraton Universal Hotel located on the grounds of the world renowned Universal City.

The convention, scheduled for the heart of the Bicentennial year, will feature the role of the surveyor in the historical development of our country, as well as his future relative to technicological advancements in distance measuring and earthquake prediction.

One of the featured speakers on the convention program will be Mr. John G. Gergen, Assistant Chief, Horizontal Network Branch, National Geodetic Survey. Mr. Gergen is a key member of the "New Adjustment Team" and will discuss the New Adjustment of the North American Datum. Coincidental with Mr. Gergen's presentation, the Fairweather will be in Long Beach Harbor during the time of the convention. The Fairweather is a ship of the National Oceanic and Atmospheric Administration, and an open house tour is being planned.

Another exciting feature of the program will be a look at the Aries Project of the Jet Propulsion Lab of Cal Tech. Mr. Peter MacDoran, Aries Project Manager, will tell us of the advances made in the use of Quasars in Geodetic distance measuring, and the potential for earthquake prediction.

Tentative plans call for some concurrent sessions to be held with programs unique to those in private practice being conducted at the same time that others are involved in discussions of interest to those employed in the public sector.

The Convention Committee reports that special effort is being devoted to making this convention one of particular interest to the ladies. Mrs. Lori Carpenter is chairing the committee involved in the preparation of the women's activities, and an exciting program is being planned. Details of the program appear in another article in this publication.

As usual, the CLSA Convention is expected to reflect the avid interest of the exhibitors of the latest in survey equipment. Expectations are that approximately 35 companies will exhibit and demonstrate their newest and finest equipment. Traditionally, the CLSA Convention is the forum for the unveiling of the latest developments in Surveying Technology.

Highlighting the social portions of the convention will be the traditional exhibitor sponsored Cocktail Party and the Convention Banquet complete with entertainment and dancing.

Registration material will be mailed to all CLSA members, and registration forms will be reproduced in a future issue of the California Surveyor.

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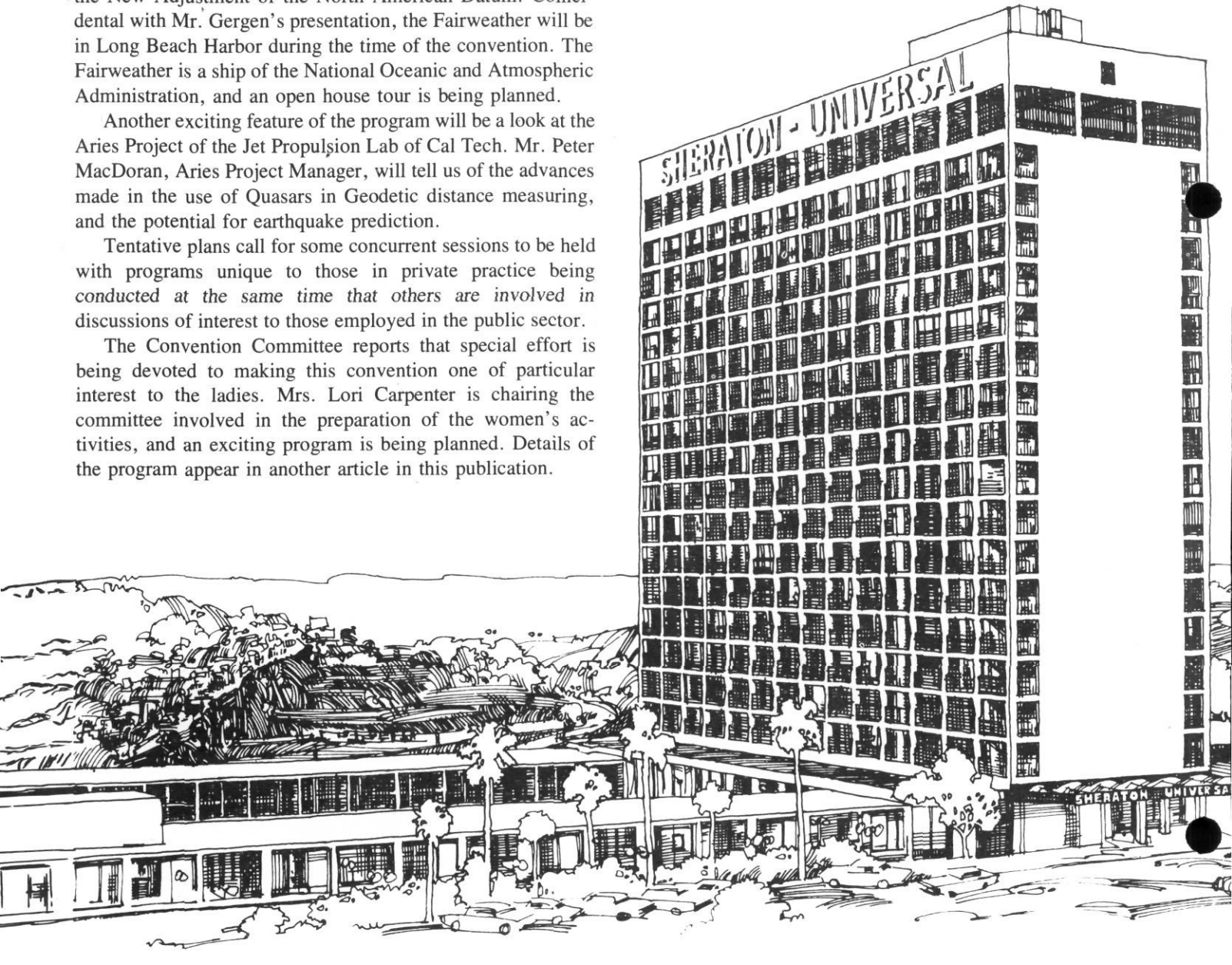

NEWS FROM THE BOARD

(Continued from page 1)

that require grading plans. These plans will require a CE's signature which could, if not overthrown, put surveyors completely out of the land development field of land surveying.

The board is proposing Rule 417 which reads as follows:

Beginning July 1, 1977, each registrant or licensee of the Board shall include their registration or license numbers on any advertisement or such presentments made to the public in the yellow pages of the telephone book for the purpose of soliciting professional engineering or land surveying business.

Note: Authority cited for this Rule is Section 137 of the Business and Professions Code. This when adopted after public hearing should effectively eliminate the problems in yellow page advertisements referred to in the summer issue.

C.L.S.A. members extends their congratulations to the following L.S.I.T.'s who passed the L.S.I.T. exam in April and invite you to become associated members of C.L.S.A.

Atwood, John Franklin
Bader, David Pearson
Barrett, Jack Edward
Bittel, Robert Joseph
Black, Walter Clyde
Blake, Jed Berkeley
Blakely, William Earl
Blanchard, Robert Glen
Blomquist, Frederick Henry
Brown, Bruce William
Brown, David R.
Bruso, Charles Williams
Brutsch, Werner
Butcher, Phillip S.
Camacho, John M.
Canas, John
Cohrs, Peter Douglas
Crider, Howard Paige
Cutler, Gary Eugene
Daugherty, Daryl Lynn
Dearing, Jay Earl
Detwiler, Worthington Earl
Dobson, Gary Lee
Dundas, Ronald Stanley
Elliott, Frederick Arthur
Fryer, John C., Jr.
Gipson, Frank Wiley
Gomes, Jeffry Anthony
Grover, John Patrick
Haecker, David Anthony
Hansen, James F.
Harrison, Dan Dennis
Hennessee, Donald Lloyd
Hibdon, Ronald Lloyd
Hoehn, Kurtis Karl
Holt, John Charles
Hooper, David Wayne
Horner, Donald Richard
Jackson, Donald Robert
Jago, Don Edward
Johnson, Robert John
Kaminsky, William Paul, Jr.
Kimball, Duane Carwin
Klagge, Errol Keith
Kling, Jerry Lee
Latta, Leroy Kenneth, Jr.
Lea, Robert Ernest
Leathers, John A., Jr.
Leishman, Lee V.
Lewis, Frank Tait, Jr.
Madigan, Jake Arthur
Marcott, Martin Donald
Masterson, William B.
McIntosh, William Ray
Moore, Dwight Victor
Morris, Alfred Doyle
Nankervis, Fred Ralph
O'Mea, Douglass George
O'Neill, Terence Aloysious
Paxton, Lawrence
Pearman, Philip Lee
Pelletier, Robert Joseph
Petersen, Terence Mark
Pile, John Timothy
Prichard, Neal Wesley
Ralston, Chester Frank
Readio, Joel
Robinson, John Doulgass
Sage, Albert E.
Schroeder, William Edward
Sheldon, Gary Keller
Snow, William Eugene
Starr, Bruce Wayne
Taber, Ronald Dean
Teitscheid, Thomas Lee
Terry, Wesley Neal
Thumlert, Stephen Robert
Todd, Thomas Edmond
Triplett, David Clearence, Jr.
Trogdon, James Edward
Tucker, Billy J., Jr.
Van Dyke, Raymond Carl
Vanhouten, Robert
Vasquez, Ramon R.
White, Lucius Vernon
Woosley, Byron Leslie
Wright, Reynolds Wesley

▲

CONVENTION - 1976

Sheraton-Universal Hotel

SHERATON HOTELS & MOTOR INNS. A WORLDWIDE SERVICE OF ITT
30 UNIVERSAL CITY PLAZA, NORTH HOLLYWOOD, CALIFORNIA 213/980-1212

PROPOSED LADIES ACTIVITIES

What better way to celebrate the Bicentennial year than to have the Hospitality Room located in the magnificent Presidential Suite of the Sheraton-Universal. Relax and enjoy complimentary refreshments and friendly conversation in an atmosphere of luxury and spacious surroundings. To further insure your comfort, a Hospitality Hostess will be available from 9:00 a.m.

A full schedule begins Friday morning with coffee and donuts served in the Hospitality Room. At 10:30 a.m., private trams with tour guides will leave for Universal City, where a luncheon will be served in the glamorous Studio Commissary. Then on to a tour of Universal where fun, action and excitement are guaranteed to make you smile. Linger at the Live Entertainment Area or return to the hotel at your convenience aboard shuttle buses. Perhaps a quick visit to the Hospitality Room before preparing for the evening festivities.

Saturday morning, pre-tour coffee and refreshments will be served in the Hospitality Room. Chartered buses will leave at 10:00 a.m. for a scenic ride to the famous Huntington

Library—Art Gallery and Botanical Gardens. The Art Gallery was originally the Huntington residence and has such notable works of art as Gainsborough's "Blue Boy," Lawrence's "Pinkie," plus one of the richest assemblages of furniture, tapestries, porcelain, sculpture, ceramics and silver in America. The paintings are displayed in domestic settings similar to those for which the art was created. Docent guides will take us through the spectacular Botanical Gardens where an extensive collection of plants, shrubs and trees are arranged in breathtaking displays. Better bring your camera, plenty of film and walking shoes as we continue after a short ride to the stately old Huntington-Sheraton Hotel for lunch. Before boarding the buses for the return trip, take a leisurely stroll through the gardens and grounds which make this beautiful establishment so very well known. Time permitting, we invite you to again make use of the Hospitality Room where you will always receive a cordial welcome.

For those who prefer to explore on their own, many small shops are available a short distance from the Hotel and the Hospitality Room will remain open throughout the day. ▲

Survey Stakes Not A Site Improvement Under Mechanics Lien Law

A State Court of Appeals (2nd Appellate District) ruled recently that survey stakes and markers left on property by an engineering firm are merely devices to assist in preparing maps and plans and are not themselves a "work of improvement" or a "site improvement" under provisions of the Mechanics Lien Law. This ruling of the Appeals Court overturned an earlier decision of a trial court (Superior Court) which upheld the validity of a lien filed by the engineering firm against the property in question.

The case arose when the engineering firm filed an action to foreclose a mechanics lien on some property for subdivision whose owners were foreclosed by a savings & loan lender with a first deed of trust. So the priority of liens upon the same property became an issue for the court to resolve.

In order for the engineering firm to gain a priority, it had to establish that actual work on the ground by way of a "work of improvement" or "site improvement" was started before the S & L's first trust deed was created and recorded. It did so by establishing that it had placed markers (doughnut-shaped plaster aerial monuments) and stakes (engineering stakes) on the property before the S&L's deed of trust was filed.

When the trial court found for the engineering firm its decision was based on the fact that the markers constituted notice to the S&L that work had been performed on the proposed subdivision. The Appeals Court, on the other hand, concluded "that these markers and stakes were only devices to assist (the engineering firm) in preparing its maps and plans and were not themselves a 'work of improvement' or a 'site improvement.' " Continuing, the Appeals Court said, "those devices were merely aids to preparing maps and plans and did not improve or alter the Ground."

While the project contemplated only subdivision of building sites and not construction of buildings, the court held that the principle is the same, saying that until some grading or clearing of the property was commenced, the nonvisible work of preparing plans and engineering studies could not provide a basis for giving the engineering firm's lien a priority over the S&L's deed of trust even though the marking devices were left on property. [South Bay Engineering Corp vs Citizens Savings & Loan Association, Second Appellate District, Division Two]

In 1961, by way of contrast, another Appeals Court held "that the setting of permanent monuments in the ground, for land subdivision, following extensive engineering services, is similarly the commencement of a 'work of improvement,' or 'improvement,' and an integral and essential part of the 'scheme of improvement' as those terms are used in Code of Civil Procedure, section 1182." [George S. Nolte vs Wm. How Smith, et al, District One, Division One]

Reprinted from the "C.C.C.E. & L.S. Newsletter." ▲

EDITORIAL COMMENTS

A COUNTY SURVEYOR VIEWS THE RECORD OF SURVEY LAWS

by Eugene P. Ehe,
County Surveyor, San Bernardino County

In 1974 C.L.S.A. sponsored a Bill (AB3519) which amended that portion of the Land Surveyors Act relating to Records of Survey.

Two of the changes the Bill made were the addition of the term "physical change" to Section 8762(a) and the requirement for the Surveyor's and County Surveyor's Certificate on the in lieu maps filed by public officers.

The certificate requirement on the map filed by a public officer in my estimation would require that the in lieu map show the same data and have the same review by the County Surveyor as a Record of Survey. (The format may be different in that the in lieu map is not restricted to only an 18 inch by 26 inch sheet.) The Record of Survey law as I read it would require a map to be filed on all property surveys. The only exception to this rule is retracing lines shown on a recorded map. If no indication of alternate monument location or material discrepancy with the record is found a map is not required.

The above statements are made after a complete analysis of all information compiled on the subject, discussions with our County Counsel, and review of an Attorney General's Opinion on the subject dated February, 1969. The Attorney General's Opinion states:

> "I do not believe that the reseting of a previously recorded monument which has become delapidated requires the filing of a new record of survey, despite the fact that Section 8764 requires the inclusion in the record of survey of any monuments "reset" or "replaced." This is because the resetting or replacing of monuments, in the nature of maintenance, does not change the purpose and functional identity of a previously recorded monument. It is already shown on a record of survey, and the filing of a new record of survey would not add to the public knowledge. However, where any resetting or replacing of a monument so changes the nature of a monument as to dehor the record, then, to maintain the reliability of the record, a new record of survey should be filed."

To me this interpretation appears like a practical approach to the Record of Survey requirements. Areas where surveys are not of record and areas where large discrepancies exist with the record, require that maps be filed to assist later surveyors, however, when property lines are well documented by recorded information and no discrepancies exists, the recording of additional maps is just an additional cost with no great return. In areas of California with large population these additional maps could actually create the problem of cluttering records with redundant information.

In my years of working with the Land Surveyors Act I have come to the conclusion that it is one of the better pieces of legislation enacted in California. We should try to keep in mind the reason for its enactment and let this guide our practice of land surveying. ▲

Letters to the Editor

Dear Editor:

The writer is flattered that you published his "Compilation of Rules for Land Surveyors" in the fall edition of your newsletter, and he thanks you for your consideration. However, your small change in the title (the original was: *Madson's Compilation of Rules for Land Surveyors)* leaves the impression that these gems are his original writings. This is not true. He can lay claim to some original effort in a few of the rules, but the majority are quotes from other authors. Curt Brown, in particular, could be understandably indignant if he thought the writer was wantonly plagiarizing some of his best thoughts, as is implied.

This compilation of rules was prepared by the writer as an in-house expression of the feelings of the writer and distributed to his survey employees for their betterment. It may have been imprudent, but a copy was given to an old friend from the Wisconsin Surveyor's Society. He evidently liked the rules and sent them to the Wisconsin newsletter. The Wisconsin editor figured it was just about right for a one page fill-in, so he printed it along with a brief profile and photograph of the writer. Believe me when I first thumbed through that edition I was one surprised S.O.B.—darn near swallowed my whole chew of snoose.

Well, that's how it all happened. All I wish to add is that I am concerned that Curt, and your other readers, be apprised of the truth. Anyone that has read *Boundary Control and Legal Principles* is surely going to recognize the source of many of the rules compiled. I do not desire to be left with my hand in the till, as it now appears. Please favor me with a short paragraph of explanation in the next issue of your fine *newsletter.*

With best regards, I am,

Very Truly Yours,
Carlisle Madson, L.S.

Dear Editor,

In response to Andy Johnston's letter to the editor printed in the Fall edition, I would like to thank him for correctly pointing out the proper standing for G.L.O. I would further like to point out that the Board has never failed anyone for missing one question on the examination. Furthermore, every failing examinee has 60 days after notification to review the exam and appeal a decision.

John Pedri, L.S. ▲

SURVEYORS ACROSS THE NATION

VIRGINIA ASSOCIATION OF SURVEYORS

Sec.-Treas.: William O. McIntosh, 10560 Main St., Fairfax, VA 22030

Newsletter: *OLD DOMINION SURVEYOR*

Editor: Clifford A. Thorpe, Jr., P.O. Box 278, Falls Church, VA 22046

Publishing Dates: Quarterly; March, July, October & December

Limit on Housing Starts

Reprinted from the Los Angeles Daily Journal

The **Ninth Circuit Court of Appeals** has held that the City of Petaluma, California may limit its urban growth by means of an ordinanee which restricts the number of housing units which can be built each year.

Petaluma is located some 40 miles north of San Francisco, and was drawn into the Bay Area metropolitan housing market as people working in San Francisco became willing to commute longer distances. Alarmed by the resultant growth, the city adopted a plan that fixes the housing development growth rate at not more than 500 dwellings per year. This plan, however, exempted all building projects of less than four units.

Plaintiff landowners and construction associations instituted this suit, alleging that the City's plan was unconstitutional, "in that it was violative of the Fourteenth Amendment. They argued that the plan is nothing more than an arbitrary and unreasonable exclusionary zoning device, designed solely to insulate Petaluma from the urban complex in which it finds itself.

Defendant city responded that the purpose of the plan was the preservation of Petaluma's small town character and the avoidance of the social and environmental problems caused by an uncontrolled growth rate. Plaintiffs urged that these purposes fell outside the scope of any legitimate governmental interest.

The district court ruled certain sections of the plan unconstitutional. The circuit court reversed.

Applying the minimal scrutiny standard, the circuit court began by noting that practically every zoning ordinance excludes some activity or structure or density of population. If such an exclusion bears any rational relationship to a legitimate state interest, the court said, the zoning ordinance is constitutional. Thus, reasonableness, not the wisdom, of the city's plan was at issue here.

The court then went on to state the "well-settled" rule that zoning regulations must find their justification in some aspect of the police power, asserted for the public welfare. The tribunal found that although the plan may frustrate some legitimate housing needs in the San Francisco region, it was not arbitrary and unreasonable. If the plan did not serve the region well it was up to the State Legislature, the court said, and not a federal court to intervene and adjust the system.

Finally, the tribunal concluded that "the concept of public welfare is sufficiently broad to uphold Petaluma's desire to preserve its small town character, its open spaces and low density of population, and to grow at an orderly and deliberate pace."

Construction Industry Assn. v. City of Petaluma, USCA 9th, 74-2100, Aug. 13, 1975, per Choy, J. (ljo)

▲

A THOUGHT

In Passing, on the Passing of the Catenary

by A. Woodpounder

I am a wood pounder. My basic purpose in life is to pound wood into the ground at all appropriate points, after searching diligently and long, after having given due weight to incomplete title reports, incorrectly written deeds, and to the three iron pipes which purport to represent a section corner—two of said pipes having identical tag numbers, the third being new and untagged and all appearing to ignore a granite stone resting undisturbed under a bush approximately ten feet to the west. Please! I don't need to be Certified—not yet.

Due to my inability to relate to my peer group, and my penchant for "doing my thing" without thought for the 'morrow, I have already allowed a large organization to control my "art" of wood pounding.

Having arrived at a point of development where registration as a civil engineer automatically confers all the rights, privileges and abilities of a land surveyor upon the registrant, why further obfuscate a (to the layman) confused situation by tacking on an unnecessary appendage.

Why not use "Uncertified" for those C.E.s and L.S.s who do not show the superior qualification for which you say there is growing pressure. Pressure from whom?

My approximate estimate (all my work is approximate) of C.L.S.A. membership, is 10% of the total number of land surveyors licensed by the State of California. These land surveyors in turn represent approximately 10% of all people who are by laws of this state, allowed to practice land surveying. I believe therefore that I am correct when I state that C.L.S.A. represents 1.0% of those people practicing land surveying and based upon this majority mandate you wish to "Certify" me.

I don't have a great deal of time as my daylight hours (I don't moonlight) are filled with frantic and usually fruitless attempts to convince potential clients that I am not a defrocked civil engineer. That being licensed and not registered is terminology over which I have no control, and does not have the same connotation as Registered Nurse and Licensed Vocational Nurse, (or does it?). That it isn't a requirement of the State of California that a R.C.E. supervise my work or sign my plans.

I am not contesting the statement that anyone hiring a surveyor is assured of nothing in excess of a competent wood pounder. My objection is to the emphasis on the land surveyor.

If my estimates are correct, 90% of the wood referred to is being pounded by a civil engineer, and if he happens to be under the age of 40, he is probably having trouble deciding which end to pound. In a few years he will resolve this problem, and be then confronted with the dual problems of "where" and "why."

If there are those that like to play Don Quixote, why not try for:

a. A system of registration similar to the State of Nevada.
b. Changing L.L.S. to R.L.S.
c. Raising C.L.S.A. membership to 90%. (51% maybe?)
d. A requirement that civil engineers pass the "subprofessional" (not my quote) L.S. examination if they wish to continue to practice land surveying. ▲

COMMITTEE REPORTS ON L.S. CURRICULA ACCREDITATION

(Continued from page 1)

But like all big business or bureaucracy, problems seem to take forever to get resolved. No new accreditation group will be admitted until the overall association is satisfied that none of the existing bodies can't properly assume the new field. Therefore, we must look to the existing accreditation organizations first. ECPD has adopted criteria for engineering accreditation that it is not about to change. There are certain of the sciences that are common and essential to the many branches of engineering. These must be included to be accredited as a professional engineering curriculum. Those courses not meeting this rigid standard can be accredited as Engineering Technology, and some of the surveying and photogrammetry have been so rated.

But there is a stigma to such second class, would-be engineer. A technician is not a professional. He does not have the broad background to make professional decisions. He can not see the overall picture because he has not had the necessary training. ECPD has been studying the problem for a few years now, and may some day find a solution to this thorny problem. In the meantime, as some schools drop desirable courses from their surveying curriculum to make room for the prerequisite sciences to obtain Professional Survey Engineering, others will seek Engineering Technology classifications. The remaining schools will find, without ECPD accreditation, their graduates denied credit for the valid surveying education they received.

So California followed the Michigan lead. The Land Surveyors Act now provides for applicants for license to be permitted experience credit for "completion of a curriculum containing emphasis in land surveying subjects at a college, or junior or community college approved by the board." The Board, without accepted standards for such approval, appointed an Ad Hoc Committee to recommend standards and procedures. That report has been received and approved by the Board. The Board has notified the college Chancellors of it's readiness to consider requests for accreditation.

Any school teaching surveying should investigate the requirements for accreditation. If not accredited, it's graduates face the probability that they will receive no credit toward meeting the licensing prerequisites for their education. All it takes is a letter to the Board requesting information about the accreditation requirements for surveying curriculum. The Board will respond with a copy of the standards and procedures. If the school believes it's curriculum meets these standards, they will complete a questionnaire supplying the Board with basic data about the school program.

The Board will review the returned questionnaire and either advise the school why it does not meet the criteria, or will appoint a visitation team. The recommended visiting team should consist of one educator, one Land Surveyor in private employment and one Land Surveyor in public practice. A report is prepared by the team after it's visit, advising the board of it's findings and a recommendation regarding accreditation. It should also include a proposed letter recommending proposed improvements to the school.

Among the items the team investigates will be the faculty. This includes the number of the staff, student/staff ratio and teaching load. Licensing and society membership of the faculty and the research and professional work they are involved in or have accomplished are also considered. Attitude of the staff and officials of the school and of the students are also of concern.

Methods of instruction are reviewed along with laboratory equipment and facilities. Size and extent of the library and it's availability to students enters into their deliberations. Graduate accomplishments are investigated, both from the stand point of licensing and from satisfaction of employers and the graduates themselves. Extent of graduate participation in professional societies and community affairs also indicate the quality of professionalism absorbed by the students.

To quote from the report, "Although a full curriculum can be laid down, it is the opinion of the Committee that it is important to allow each school the freedom to offer specialty options and each student to select optional courses of his interest. A flexible approach would avoid the establishment and maintenance of a rigid standard for accreditation and also prevent ossification of Land Surveying education. Above all, it would encourage well planned experimentation."

The B.S. degree is based on 1,860 to 1,950 classroom hours, of which about 620 are state mandated general education. It is recommended that minimum requirements include the following courses, or classroom hours from the grouping, noting that the list includes material that can meet part of the state requirements. It also points out that subject matter need not be a course title, but can be combined or sequenced to meet individual school philosophy.

Basic Sciences
90 hours—physics
45 hours—chemistry, geology, biological sciences and/or astronomy

Basic Mathematics
90 hours—calculus and analytical geometry
45 hours—survey mathematics, spherical trigonometric matrices, computer programming, and/or machine computation

Geodesy
90 hours—geodetic surveying, EDM, astronomy, gravimetric surveying and/or surveying adjustments

Engineering Surveying
90 hours—basic surveying
45 hours—construction surveys, route surveys, and/or mensuration

Cartography and Photogrammetry
45 hours—basic photogrammetry
90 hours—photogrammetric plotting, photo-interpretation, topographic mapping, instrumentation, control and cartography, and survey mapping

Boundary Surveying
45 hours—property and boundary law
90 hours—real estate law, land titles, evidence and evaluation, control surveys, subdivision and land development planning
45 hours—public land surveys

The Committee is also of the opinion that the minimum requirements should be changed periodically to keep pace with

(Continued on page 15)

L.S. CURRICULA ACCREDITATION

(Continued from page 14)

developments in the Land Surveying profession. A summer camp or field project is also recommended with the option of substituting work experience. Together the minimum requirements of 810 hours plus the general educational requirements of 620 hours total 1,430 hours. Therefore, the optional courses can take up between 430-520 hours.

From the foregoing, it appears that professional land surveying may still have a chance in California. ▲

C.L.S.A. MEMBERSHIP

C.L.S.A. MEMBERSHIP

Members as of October 1, 1975	594
Sustaining Members	8
Regular Members	404
Associate Members	110
Affiliate Members	31
Student Members	41

Regular Members

Johnny E. Davis, LS
Ruel del Castillo, LS
William Edwin Large, LS
Joe H. Bryant, LS
Michael W. Motherhead, LS
James F. Nicklos, LS
Lawrence K. Sampson, LS
George W. Tennies, LS
Charles Krepp, LS
Roger A. Frank, LS
Shirley S. Atteberry, LS
Gilbert P. Beaird, LS
James W. DeGroot, LS
Bobby G. Johnson, LS
Bruce E. Wilt, LS
William L. Kistler, LS

Affiliate Members

Michael F. Beautz
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Associate Members

Glenn Otto Arndal
Millard Charles Totman
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Monte D. Yttreness
Michael Douglas Knopf
James B. Sauer
Jerry C. Hendricks
Mark P. Lisko
James S. Butler
Paul H. O'Haver
Richard A. Seale

Student Members

Clifford Cooper
Dennis G. Meyer
Leroy Kenneth Latta, Jr.
R. Anthony Novotny, Jr.

CALIFORNIA BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS

Written Examination Schedule
1976

Examination Dates	*Final Filing Dates
Land Surveyor-in-Training—LSIT	
April 10, 1976	January 26, 1976
Land Surveyor—LS	
November 6, 1976	August 16, 1976

*Applications filed after the final filing date specified will be considered for the following examination.
NOTE: This schedule is subject to change at any time without prior notice. ▲

SURVEYORS ACROSS THE NATION

NORTH CAROLINA SOCIETY OF SURVEYORS
Sec.-Treas.: Jerry Callicut, P.O. Box 10294, Greensboro, NC 27408
Newsletter: *TAR HEEL SURVEYOR*
Editor: Richard D. Croom, 22 Woodbury Rd., Asheville, NC 28804
Publishing Dates: Quarterly; January, April, August & November

WISCONSIN SOCIETY OF LAND SURVEYORS
Sec.-Treas.: Harold S. Charlier, 4167 No. 66th St., Milwaukee, WI 53216
Newsletter: *WSLS NEWSLETTER*
Editor: Harold S. Charlier
Publishing Dates: Quarterly; February, May, August & November

MAINE SOCIETY OF LAND SURVEYORS
Sec.: John W. Pickett, Pleasant St., No. Anson, ME 04473
Newsletter: *THE MAINE LAND SURVEYOR*
Editor: Carroll F. Merriam, Prospect Harbor, ME 04669
Publishing Dates: Quarterly

MARYLAND SOCIETY OF SURVEYORS
Sec.: Wallace R. Amos, 9525 Georgia Ave., Silver Spring, MD 20910
Newsletter: *MSS NEWSLETTER*
Editor: Jim Otradovec, 11 Mt. Vernon Pl., Baltimore, MD 21201
Publishing Dates: Quarterly

MINNESOTA LAND SURVEYORS ASSOCIATION
Sec.: Bernard H. Larson, 1306 West 20th St., Hastings, MN 55033
Newsletter: *DISCLOSURES*
Editor: John F. Dwyer, 1101 Cliff Rd., Burnsville, MN 55337
Publishing Dates: Quarterly; February, May, August & November

THE JUDICIAL FUNCTIONS OF SURVEYORS

by Thomas M. Cooley

Chief Justice, Supreme Court Michigan, 1864-1885

Editor's Note: This is the last installment of a two part presentation of an article originally published in the Michigan Engineering Society Journal (University of Michigan) and then again in the A.C.S.M. Surveying and Mapping, April-June 1954, Vol. XIV No. 2.

The Facts of Possession

The general duty of a surveyor in such a case is plain enough. He is not to assume that a monument is lost until after he has thoroughly sifted the evidence and found himself unable to trace it. Even then he should hesitate long before doing anything to the disturbance of settled possessions. Occupation, especially if long continued, often affords very satisfactory evidence of the original boundary when no other is attainable; and the surveyor should inquire when it originated, how, and why the lines were then located as they were, and whether a claim of title has always accompanied the possession, and give all the facts due force as evidence. Unfortunately, it is known that surveyors sometimes, in supposed obedience to the State statute, disregard all evidences of occupation and claim of title and plunge whole neighborhoods into quarrels and litigation by assuming to "establish" corners at points with which the previous occupation cannot harmonize. It is often the case that, where one or more corners are found to be extinct, all parties concerned have acquiesced in lines which were traced by the guidance of some other corner or landmark, which may or may not have been trustworthy; but to bring these lines into discredit, when the people concerned do not question them, not only breeds trouble in the neighborhood, but it must often subject the surveyor himself to annoyance and perhaps discredit, since in a legal controversy the law as well as common sense must declare that a supposed boundary line long acquiesced in is better evidence of where the real line should be than any survey made after the original monuments have disappeared. *(Stewart v. Carleton,* 31 Mich. Reports, 270; *Diehl v. Zanger,* 39 Mich. Reports, 601). And county surveyors, no more than any others, can conclude parties by their surveys.

The mischiefs of overloking the facts of possession must often appear in cities and villages. In towns the block and lot stakes soon disappear; there are no witness trees, and no monuments to govern except such as have been put in their places, or where their places were supposed to be. The streets are likely to be soon marked off by fences, and the lots in a block will be measured off from these, without looking farther. Now it may perhaps be known in a particular case that a certain monument still remaining was the starting point in the original survey of the town plat; or a surveyor settling in the town may take some central point as the point of departure in his surveys and, assuming the original plat to be accurate, he will then undertake to find all streets and all lots by course and distance according to the plat, measuring and estimating from his point of departure. This procedure might unsettle every line and every monument existing by acquiescence in the town; it would be very likely to change the lines of streets, and raise controversies everywhere. Yet this is what is sometimes done; the surveyor himself being the first person to raise the disturbing questions.

Suppose, for example, a particular village street has been located by acquiescence and used for many years, and the proprietors in a certain block have laid off their lots in reference to this practical location. Two lot owners quarrel, and one of them calls in a surveyor, that he may make sure his neighbor shall not get an inch of land from him. This surveyor undertakes to make his survey accurate, whether the original was so or not, and the first result is, he notifies the lot owners that there is error in the street line, and that all fences should be moved, say 1 foot to the east. Perhaps he goes on to drive stakes through the block according to his conclusion. Of course, if he is right in doing this, all lines in the village will be unsettled; but we will limit our attention to the single block. It is not likely that the lot owners generally will allow the new survey to unsettle their possessions, but there is always a probability of finding some one disposed to do so. We shall then have a lawsuit; and with what result?

Fixing Lines by Acquiescence

It is a common error that lines do not become fixed by acquiescence in a less time than 20 years. In fact, by statute, road lines may become conclusively fixed in 10 years; and there is no particular time that shall be required to conclude private owners, where it appears that they have accepted a particular line as their boundary, and all concerned have cultivated and claimed up to it. Public policy requires that such lines be not lightly disturbed, or disturbed at all after the lapse of any considerable time. The litigant, therefore, who in such a case pins his faith on the surveyor is likely to suffer for his reliance, and the surveyor himself to be mortified by a result that seems to impeach his juddment.

Of course, nothing in what has been said can require a surveyor to conceal his own judgment, or to report the facts one way when he believes them to be another. He has no right to mislead, and he may rightfully express his opinion that an original monument was at one place, when at the same time he is satisfied that acquiescence has fixed the rights of parties as if it were at another. But he would do mischief if he were to attempt to "establish" monuments which he knew would tend to disturb settled rights; the farthest he has a right to go, as an officer of the law, is to express his opinion where the monument should be, at the same time that he imparts the information to those who employ him and who might otherwise be misled, that the same authority that makes him an officer and entrusts him to make surveys, also allows parties to settle their own boundary lines, and considers acquiescence in a particular line or monument, for any considerable period, as strong if not conclusive evidence of such settlement. The peace of the community absolutely requires this rule. It is not long since, that in one of the leading cities of the State, an attempt was made to move houses 2 or 3 rods into the street, on the ground that a survey under which the street had been located for many years had been found on a more recent survey to be erroneous.

The Duty of the Surveyor

From the foregoing, it will appear that the duty of the surveyor where boundaries are in dispute must be varied by the

(Continued on page 17)

JUDICIAL FUNCTIONS OF SURVEYORS

(Continued from page 16)

circumstances.

1. He is to search for original monuments, or for the places where they were originally located, and allow these to control if he finds them, unless he has reason to believe that agreements of the parties, express or implied, have rendered them unimportant. By monuments, in the case of government surveys, we mean, of course, the corner and quarter stakes. Blazed lines or marked trees on the lines are not monuments; they are merely guides or finger posts, if we may use the expression, to inform us with more or less accuracy where the monuments may be found.

2. If the original monuments are no longer discoverable, the question of location becomes one of evidence merely. It is merely idle for any State statute to direct a surveyor to locate or "establish" a corner, as the place of the original monument, according to some inflexible rule. The surveyor, on the other hand, must inquire into all the facts, giving due prominence to the acts of parties concerned, and always keeping in mind, first, that neither his opinion nor his survey can be conclusive upon parties concerned, and, second, that courts and juries may be required to follow after the surveyor over the same ground, and that it is exceedingly desirable that he govern his action by the same lights and the same rules that will govern theirs.

It is always possible, when corners are extinct, that the surveyor may usefully act as a mediator between parties and assist in preventing legal controversies by settling doubtful lines. Unless he is made for this purpose an arbitrator by legal submission, the parties, of course, even if they consent to follow his judgment, cannot, on the basis of mere consent, be compelled to do so; but if he brings about an agreement, and they carry it into effect by actually conforming their occupation to his lines, the action will conclude them. Of course, it is desirable that all such agreements be reduced to writing, but this is not absolutely indispensable if they are carried into effect without.

Meander Lines

The subject of meander lines is taken up with some reluctance because it is believed the general rules are familiar. Nevertheless, it is often found that surveyors misapprehend them, or err in their application; and as other interesting topics are somewhat connected with this, a little time devoted to it will probably not be altogether lost. These are lines traced along the shores of lakes, ponds, and considerable rivers, as the measures of quantity when sections are made fractional by such waters. These have determined the price to be paid when government lands were bought, and perhaps the impression still lingers in some minds that the meander lines are boundary lines, and that all in front of them remains unsold. Of course this is erroneous. There was never any doubt that, except on the large navigable rivers, the boundary of the owners of the banks is the middle line of the river; and while some courts have held that this was the rule on all fresh-water streams, large and small, others have held to the doctrine that the title to the bed of the stream below low-water mark is in the State, while conceding to the owners of the banks all riparian rights. The practical difference is not very important. In this State, the rule that the centerline is the boundary line is applied to all our great rivers, including the Detroit, varied somewhat by the circumstance of there being a distinct channel for navigation, in some cases, with the stream in the main shallow, and also sometimes by the existence of islands.

The troublesome questions for surveyors present themselves when the boundary line between two contiguous estates is to be continued from the meander line to the center-line of the river. Of course, the original survey supposes that each purchaser of land on the stream has a water front of the length shown by the field notes; and it is presumable that he bought this particular land because of that fact. In many cases it now happens that the meander line is left some distance from the shore by the gradual change of course of the stream, or diminution of the flow of water. Now the dividing line between two government subdivisions might strike the meander line at right angles, or obliquely; and, in some cases, if it were continued in the same direction to the centerline of the river, might cut off from the water one of the subdivisions entirely, or at least cut it off from any privilege of navigation or other valuable use of the water, while the other might have a water front much greater than the length of a line crossing it at right angles to its side lines. The effect might be that, of two government subdivisions of equal size and cost, one would be of great value as water-front property, and the other comparatively valueless. A rule which would produce this result would not be just, and it has not been recognized in the law.

Nevertheless it is not easy to determine what ought to be the correct rule for every case. If the river has a straight course, or one nearly so, every man's equities will be preserved by this rule: Extend the line of division between the two parcels from the meander line to the centerline of the river, as nearly as possible at right angles to the general course of the river at that point. This will preserve to each man the water front which the

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JUDICIAL FUNCTIONS OF SURVEYORS

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field notes indicated, except as changes in the water may have affected it, and the only inconvenience will be that the division line between different subdivisions is likely to be more or less deflected where it strikes the meander line.

This is the legal rule, and is not limited to government surveys, but applies as well to water lots which appear as such on town plats. *(Bay City Gas Light Co. v. The Industrial Works,* 28 Mich. Reports, 182.) It often happens, therefore, that the lines of city lots bounded on navigable streams are deflected as they strike the bank, or the line where the bank was when the town was first laid out.

Irregular Watercourses

When the stream is very crooked, and especially if there are short bends, so that the foregoing rule is incapable of strict application, it is sometimes very difficult to determine what shall be done; and in many cases the surveyor may be under the necessity of working out a rule for himself. Of course his action cannot be conclusive; but if he adopts one that follows, as nearly as the circumstances will admit, the general rule above indicated, so as to divide as near as may be the bed of the stream among the adjoining owners in proportion to their lines upon the shore, his division, being that of an expert, made upon the ground, and with all available lights, is likely to be adopted as law for the case. Judicial decisions, into which the surveyor would find it prudent to look under such circumstances, will throw light upon his duties and may constitute a sufficient guide when peculiar cases arise. Each riparian lot owner ought to have a line on the legal boundary, namely, the centerline of his line on the shore, and the problem in each case is how this is to be given him. Alluvion—when a river imperceptibly changes its course—will be apportioned by the same rules.

The existence of islands in a stream when the middle line constitutes a boundary, will not affect the apportionment unless the islands were surveyed out as government subdivisions in the original admeasurement. Whereever that was the case, the purchaser of the island divides the bed of the stream on each side with the owner of the bank, and his rights also extend above and below the solid ground, and are limited by the peculiarities of the bed and the channel. If an island was not surveyed as a government subdivision previous to the sale of the bank, it is, of course, impossible to do this for the purposes of government sale afterward, for the reason that the rights of the bank owners are fixed by their purchase; when making that, they have a right to understand that all land between the meander lines, are separately surved and sold, will pass with the shore in the government sale and, having this right, anything which their purchase would include under it cannot afterward be taken from them. It is believed, however, that the Federal courts would not recognize the applicability of this rule to large navigable rivers, such as those uniting the Great Lakes.

On all the little lakes of the State which are mere expansions near this mouths of the rivers passing through them—such as the Muskegon, Pere Marquette, and Manistee—the same rule of bed ownership has been judicially applied that is applied to the rivers themselves; and the division lines are extended under the water in the same way. *(Rice v. Ruddiman,* 10 Mich., 125.) If such a lake were circular, the lines would converge to the center; if oblong or irregular, there might be a line in the middle on which they would terminate whose course would bear some relation to that of the shore. But it can seldom be important to follow the division line very far under the water, since all private rights are subject to the public rights of navigation and other use, and any private use of the lands inconsistent with these would be a nuisance, and punishable as such. It is sometimes important, however, to run the lines out for considerable distance in order to determine where one may lawfully moor vessels or rafts for the winter or cut ice. The ice crop that forms over a man's land of course belongs to him. *(Lorman v. Benson,* 8 Mich., 18; *People's Ice Co. v. Steamer Excelsior,* recently decided.)

Meander Lines and Riparian Rights

What is said above will show how unfounded is the notion, which is sometimes advanced, that a riprarian proprietor on a meandered river may lawfully raise the water in the stream without liability to the proprietors above, provided he does not raise it so that it overflows the meander line. The real fact is that the meander line has nothing to do with such a case, and an action will lie whenever he sets back the water upon the proprietor above, whether the overflow be below the meander lines or above them.

As regards the lakes and ponds of the State, one may easily raise questions that it would be impossible for him to settle. Let us suggest a few questions, some of which are easily answered, and some not:

1. To whom belongs the land under these bodies of water,

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JUDICIAL FUNCTIONS OF SURVEYORS

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where they are not mere expansions of a stream flowing through them?

2. What public rights exist in them?

3. If there are islands in them which were not surveyed out and sold by the United States, can this be done now?

Others will be suggested by the answers given to these.

It seems obvious that the rules of private ownership which are applied to rivers cannot be applied to the great lakes. Perhaps it should be held that the boundary is at low water mark, but improvements beyond this would only become unlawful when they became nuisances. Islands in the great lakes would belong to the United States until sold, and might be surveyed and measured for sale at any time. The right to take fish in the lakes, or to cut ice, is public like the right of navigation, but is to be exercised in such manner as not to interfere with the rights of shore owners. But so far as these public rights can be the subject of ownership, they belong to the State, not to the United States, and so, it is believed, does the bed of a lake also. *(Pollord v. Hagan,* 3 Howard's U. S. Reports.) But such rights are not generally considered proper subjects of sale, but like the right to make use of the public highways, they are held by the State in trust for all the people.

What is said of the large lakes may perhaps be said also of the interior lakes of the State, such, for example, as Houghton, Higgins, Cheboygan, Burt's Mullet, Whitmore, and many others. But there are many little lakes or ponds which are gradually disappearing, and the shore proprietorship advances *pari passu* as the waters recede. If these are of any considerable size —say, even a mile across—there may be questions of conflicting rights which no adjudication hitherto made could settle. Let any surveyor, for example, take the case of a pond of irregular form, occupying a square mile or more of territory, and undertake to determine the rights of the shore proprietors to its bed when it shall totally disappear, and he will find he is in the midst of problems such as probably he has never grappled with or reflected upon before. But the general rules for the extension of shore lines, which have already been laid down, should govern such cases, or at least should serve as guides in their settlement.

Where a pond is so small as to be included within the lines of a private purchase from the government, it is not believed the public have any rights in it whatever. Where it is not so included, it is believed they have rights of fishery, rights to take ice and water, and rights of navigation for business and pleasure. This is the common belief, and probably the just one. Shore rights must not be so exercised as to disturb these, and the States may pass all proper laws for their protection. It would be easy with suitable legislation to preserve these little bodies of water as permanent places of resort for the pleasure and recreation of the people, and there ought to be such legislation.

If the State should be recognized as owner of the beds of these small lakes and ponds, it would not be owner for the purpose of selling. It would be owner only as trustee for the public use; and a sale would be inconsistent with the right of the bank owners to make use of the water in its natural condition in connection with their estates. Some of them might be made salable lands by draining; but the State could not drain, even for this purpose, against the will of the shore owners, unless their rights were appropriated and paid for.

Upon many questions that might arise between the State as owner of the bed of a little lake and the shore owners, it would be presumptuous to express an opinion now, and fortunately the occasion does not require it.

Quasi-Judicial Capacity of Surveyors

I have thus indicated a few of the questions with which surveyors may now and then have occasion to deal, and to which they should bring good sense and sound judgment. Surveyors are not and cannot be judicial officers, but in a great many cases they act in a quasi-judicial capacity with the acquiescence of parties concerned; and it is important for them to know by what rules they are to be guided in the discharge of their judicial functions. What I have said cannot contribute much to their enlightenment, but I trust will not be wholly without value. ▲

New C.L.S.A. Orange County Chapter Takes Photogrammetric Tour

by Tallas D. Margrave, L.S.

On November 13, 1975 the recently formed Orange County, California Chapter of the California Land Surveyors' Association toured the Photogrammetric Facilities of VTN Consolidated, Inc. located in Irvine, California. The tour was conducted by Mr. Jack Van Eden, Senior Vice President and Mr. Dudley W. Line, Vice President of the Photogrammetric Division of VTN. Mr. Van Eden explained that VTN has total in-house capability for all phases of photogrammetry, including aerial photography, field control surveys, analytical aerotriangulation, stereo compilation, drafting, and photo lab reproduction. Van Eden described the steps involved in laying out a project for aerial photography and covered the selection of the proper aircraft and aerial cameras to meet a clients specific requirements. The company currently operates two photographic aircraft, one a turbo-charged Cessna 206, Super Skywagon, capable of reaching altitudes up to 30,000 feet, and a Super-Charged Grand Aero-Commander, Model 680 FL, with an altitude capability of 25,000 feet above sea level. The company is equipped with the latest Zeiss and Wild Aerial Cameras, including a new Wild RC-10 aerial camera, equipped with interchangeable lens cones of 3½″ and 6″ focal length. These cameras, which range in value from $35,000 to $75,000, are capable of obtaining black and white, color, and color infrared photography without adjustment to the lens system.

Mr. Line gave a detailed explanation of the firms' proprietary "ATRIG" analytical aerotriangulation system. Analytical aerotriangulation is a photogrammetric technique for extending precise ground control measurements by analytical methods. The firm has developed a computer program which enables them to determine coordinate positions and elevations of any ground feature to an accuracy of one ten-thousandths (1/10,000ths) of the aircraft altitude above ground. This

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PHOTOGRAMMETRIC TOUR

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enables the photogrammetrist to determine accurate positions and elevations on ground features, and significantly reduce the cost of conventional field control survey surveys. All computations are performed in-house on one of VTN's two electronic computers.

Van Eden demonstrated the operation of one of VTN's five Wild-Heerbrugg First-Order Stereoscopic Plotting Instruments used for compilation of precise planimetric and topographic maps at scales ranging from 1″ = 20′ with a 6″ contour interval to as small as 1″ = 1 mile with a 20′ contour interval. VTN currently operates three Wild A-10 stereo plotters, more than any other firm in the world, a Wild A-8, and a Wild A-7. These instruments have an accuracy capability that enables them to compile standard accuracy maps from aerial photography flown at twice the altitude required by more conventional plotting instruments. These instruments significantly reduce the number of aerial photographs required to cover a project area and significantly reduce the number of ground control points required which result in a cost saving for their clients. These stereo plotting instruments are also interfaced with three-axis digitizers and card punches to enable them to record cross-section and profile data directly from the stereo plotting instrument.

VTN's Wild A-8 stereo plotter is also equipped with a PPO-8 Orthophotoscope attachment which enables them to produce fully rectified, scalable photo maps on which contours can be superimposed. These photo maps have met wide acceptance among city planners, engineers, geologists, and environmentalists where surface features or vegetation are of critical importance.

VTN is also heavily orientated toward digitizer-computer-plotter operations. They have developed numerous software programs for contouring from digitized information. One such program is being used for the production of Isopach maps of subsurface mineral deposits for the development of mining plans for open pit mines. This work is being carried out for a number of large coal companies in the Powder River Basin of Wyoming. VTN has also developed a software program known as "EASY" which seeks the optimum horizontal and vertical alignment for roads, railroads, and pipelines. This program is currently being used to design a new 100 mile location for a major railroad. Input to the program consists of photogrammetrically determined digitized cross-sections, the specific railroad design parameters, and train performance characteristics. The output is a computer plotted alignment and profile with balanced cuts and fills and a tabulation of earthwork volumes complete with staking notes for field staking the catch points.

VTN's photographic laboratory is fully equipped to handle any type of photographic reproduction in sizes up to 44″ × 80″ from negatives up to 40″ × 50″ in size.

Chapter President Ruel Del Castillo, Charles Krepp, Vice President, Roger Frank, Secretary, and William Large, Treasurer, all thanked Mr. Van Eden and Mr. Line for osting the tour of VTN's photogrammetric facility.

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New H.P. Instrument

A new electronic distance and angle measuring device that will allow surveyors to save from 30 to 60 percent of the time normally required to complete project layouts and location surveys was announced today by Hewlett-Packard Company.

The new HP 3810A Total Station enables a surveyor to set up in one spot and make all of the necessary measurements automatically from that point. Each measurement can be made in less than six seconds. It also eliminates the need for a transit or a theodolite.

The Total Station automatically measures slope distance, zenity angle, corrects for curvature and refraction and automatically computes and displays horizontal distance. All of this is done at the touch of a single button, once the target is acquired. Zenith angle, slope distance and vertical distance can also be displayed.

The battery-powered instrument comes with an optical micrometer reading base that allows measurement of horizontal angles. When the user dials in atmospheric information (ppm correction), the HP 3810A corrects automatically for existing conditions.

The Total Station's tracking mode enables a surveyor to make a distance measurement every three seconds to "track" a moving prism target out to a predetermined distance.

The HP 3810A has a range of one mile (1.6km). Distance measurements may be displayed in feet or meters, and angle measurements in degrees or grads. If a break occurs in the infrared measuring beam, or atmospheric conditions prevent acceptable measurements, the instrument gives a flashing signal. When the obstruction is cleared, or conditions improve, the HP 3810A will automatically continue the measurement sequence.

Customer deliveries of the HP 3810A Total Station will begin in November. Optional accessories available include battery rechargers, extra battery pods, tilting prisms and layout range poles.

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The Education of the Future Professional Land Surveyor

(Continued from page 6)

according to individual interests or aptitudes. For example, some individuals relate more to the "art" than the "science" and vice versa. Students should not be forced into one approach. This does not mean that the core should be weakened, however. The core protects the public and gives life, strength, and definition to the profession. The areas of emphasis provide desirable flexibility and choice for the student.

The areas of emphasis would contain courses of an advanced nature in each area and electives supporting these courses. The number of electives, again, would depend on how many credit hours are left after all university, college, and departmental requirements are completed, and on the size of the core. The stronger core would leave room for fewer electives and the weaker core, many electives. Too few electives would unnecessarily restrict the student and force him into one mold which is not desirable for the student or the profession as a whole. Too many electives leaves choice which may at first glance seem desirable. But if too flexible, the curriculum, and thus the profession becomes ill-defined. Not only would the core become unnecessarily weakened but it is doubtful that the student would be better able to "put it all together" with a huge selection of electives than he would with some restrictions and careful choices. This author would suggest that areas of emphasis consist of at least 10 and not more than about 25 semester credit hours. There might be requirements for specific courses within each area but most should be electives from approved lists.

The Teaching Approach

As has been stated earlier, professional education teaches individuals how to think. The faculty in a professional degree program must be willing and able to teach on a professional level—higher than pure technical "knob turning" but not so high on a theoretical level as to lose sight of reality. Professionalism, ethics, responsibilities to the public and the value of participation in professional activities should be emphasized. The instilling of a desire to continue to learn after graduation, serve the public, and seek professional registration should be the responsibility of the faculty.

Summary

For years, many Surveyors have advocated separate degree programs for educating professional surveyors. Only recently has much action been taken to direct the education along the lines of a separate degree program and away from the apprenticeship method and civil engineering approach. Land surveying today is a broad field and is not confined in practice or definition to property surveying alone. Such a broad field requiring knowledge of modern equipment, background in several areas, and an appreciation of public responsibility warrants an educational program consistent with accepted standards for any profession. There is so much involved in the Surveying profession that Surveyors should not need to become civil engineers or scientists first. They can become proud surveying professionals first, then diversity or pursue scientific endeavors if they are so inclined.

It is felt that the approach suggested herein will fill the gap mentioned, educate profesional Surveyors who wish to go into practice or government work, and give background for more advanced graduate study. Graduates would be groomed for any type of surveying endeavor whether it required professional registration or not.

The surveying profession has evolved to a point where education equivalent to a four year Bachelor's Degree program is essential. There is more than enough depth in modern surveying practice and sufficient demand to warrant having such separate surveying degree programs. The core of required courses, the areas of specialization, and the teaching approach form the substance of a professional level program and must be very carefully planned. The core should include a well-rounded coverage of both practical and scientific surveying topics, these topics should be presented in a professional manner, and students should be given choices of well-defined professional areas of specialization. ▲

NEWS BRIEFS

. . . . The Marin County Chapter is now providing its membership with a C.L.S.A. Logo to be used on letterheads and business cards to indicate membership in C.L.S.A.

. . . . Pasadena City College is currently offering a comprehensive two year Land Surveying program and has made revisions in the curriculum to conform with and meet the transfer program at Fresno State. For information regarding Day, Evening and Saturday classes, contact Richard Hauck, c/o E&T P.C.C., 1570 E. Colorado Blvd., Pasadena, California 91106. Phone 213-578-7308.

. . . . The Nevada Land Surveyors Association will hold its 1976 convention in Las Vegas at the Sahara Hotel on March 4-6, 1976.

. . . . The Wisconsin Society of Land Surveyors has published a book by Lowell O. Stewart entitled "Public Land Surveys: History, Instructions, Methods." It is available to C.L.S.A. members for $6.00 and others for $7.00 by writing Harold S. Charlier, Secretary W.S.L.S., 4167 North 66th St., Milwaukee, Wisconsin 53216.

. . . . Tom Gade, Vice-president of C.L.S.A.'s San Diego Chapter has been elected to the San Diego City Council. Tom was the only newcomer in an election that saw incumbents returned to the three other seats.

. . . . The Indiana Society of Professional Land Surveyors will begin sale of its Manual No. 5, "Computer Programs" (HP-65 Documentation). The manual contains 50 surveying programs and will sell for $1.00 per copy prior to December 15, 1975. After that date it will be $1.25, from I.S.P.L.S., 111 N. Capitol Ave., Indianapolis, Indiana 46204.

. . . . C.L.S.A. will purchase a supply of the recently published "Supplement to the Manual of Instructions for the Survey of the Public Lands" and offer them for sale to members.

Surveyors Across the Nation

MONTANA ASSOCIATION OF REGISTERED LAND SURVEYORS
Sec.-Treas.: William D. Bayer, 112 Cohosset, Missoula, MT 59801
Newsletter: *MARLS NEWSLETTER*
Editor: R.A. Ainsworth, 3201 Russell, P.O. Box 298, Missoula, MT 59801
Publishing Dates: Quarterly

PROFESSIONAL SURVEYORS ASSOCIATION OF NEBRASKA
Sec.: A. Vinson Hiatt, 1727 57th St., Lincoln, NE 68505
Newsletter: *THE NEBRASKA SURVEYOR*
Editor: William L. Rynearson, 4610 Dodge St., Omaha, NE 68132
Publishing Dates: Quarterly

NEW HAMPSHIRE LAND SURVEYORS ASSOCIATION
Sec.: Donald R. Poppema, RFD #1, Center Barnstead, NH 03225
Newsletter: *NHLSA NEWSLETTER*
Editor: John Keller, Phoenix Hill Associates, Bethlehem, NH 03574
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NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS
Sec.: Charles E. Hartnett, Rt. 1, Box 142, Melrose, NY 12121
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MISSOURI ASSOCIATION OF REGISTERED LAND SURVEYORS
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PROFESSIONAL LAND SURVEYORS OF OHIO
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Newsletter: *PLSO NEWSLETTER*
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PROFESSIONAL LAND SURVEYORS OF OREGON
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Newsletter: *THE OREGON SURVEYOR*
Editor: Dexter E. Milne, P.O. Box 737, Oregon City, OR 97045
Publishing Dates: 15th of even numbered months

PENNSYLVANIA SOCIETY OF LAND SURVEYORS CENTRAL PENNSYLVANIA SECTION ACSM
Exc. Sec.: Marian Koskoden, 325 Frazier Dr., Pittsburgh, PA 15235
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Publishing Dates: January, April & September

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The California Surveyor

Published Quarterly by the

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Santa Rosa, CA 95403

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